Community Health Service

Student Module

Grade 11

FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

MINISTRY OF EDUCATION

Community Health Service

Student Module

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List of Acronym and Abbreviations

ABCDE	Airway, Breathing, Circulation, Disability and Exposure
AIDS	Acquired Immunodeficiency Syndrome
ART	Anti Retroviral Treatment
BP	Blood Pressure
CBHI	Community Based Health Insurance
CBR	Community Based Rehabilitation
CPR	CardioPulmonary Resuscitation
COPD	Chronic Obstructive Pulmonary Disease
CTE	Career Technical Education
CVDs	Cardio Vascular Diseases
EEP	Endoscopic Enucleation of the Prostate
HIV	Human Immunodeficiency Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HCW	Health Care Worker
IFG	Impaired Fasting Glucose
ITN	Insecticide Treated Net
IP	Infection Prevention
IMNCI	Integrated Management of Newborn and Childhood Illness
MCC	Motivated Competent and Compassionate Care
MUAC	Mid-Upper Arm Circumference
NCD	Non Communicable Disease
OSHA	Occupational Safety and Health Administration
ORS	Oral Rehydration Solution
PPE	Personal Protective Equipment
5S	Sort, Set in, Shine, Standardize, Sustain
SIM	Simply Termed Severe Mental Illness
STI	Sexually Transmitted Infection

LIST OF MODULES

Introduction to the Student Module

Community health is non treatment based health services that are delivered outside hospitals and clinics. Community health service is an important component of public health, which focuses on promoting and protecting the health of populations. In order to attain these, students will take different courses that are designed to provide them with a comprehensive understanding of the factors that influence the health of communities, including social, environmental, economic, and behavioral determinants.

The main objectives of this student module is to equip grade 11 students with the basic knowledge, skill and attitude so that they could be able to run their work in community health service, to be hired in different organization or future continuing their career in higher education institutions.

This module prepared for students in grade 11 the modules incorporate seven modules. Each competency includes different elements including the module title, description of the module, learning outcomes (units), unit objectives, key terms, contents and sub-contents, unit summary, summary of the module, review questions, project works, answer keys and references.

For effective use of this module, it is important to follow the provided instructions. First, read through the learning outcomes to understand the key objectives of the module. Next, carefully study the lessons, ensuring you comprehend the topics being discussed. After each topic, complete the "Self-checks" and use the provided answer key to correct your work only after you have finished answering. At the end of each unit at each module, accomplish the unit review questions and practical activities, then refer to the answer key or request your teacher/trainer to provide feedback on your work. Finally, complete the 'Project Work' located at the end of each module. Following these step-by-step instructions will help you maximize the learning potential of this module.

Module I

Professional Ethics

CONTENTS

Module Description

This student module is prepared to achieve the required competency in professional ethics that will address the required knowledge, attitude and skills to provide Motivated, Competent and Compassionate Care. At the end of this module the students will able to attain the following learning outcomes:

- Identify health professions and professionalism
- Identify health care system
- Apply community health care ethics
- Demonstrate effective health care communication
- Provide humanistic care to clients

UNIT 1

Profession and Professionalism

1.1. Introduction

The word profession can be defined as a vocation or occupation usually requiring advanced education, knowledge and skill. Thus, the term profession refers to the knowledge, attitude, and skill which can be obtained through formal education and training. A person who attained a certain specialized skill is known as a professional. It should also be acceptable to society. On the other hand, professionalism is defined as "the skill, good judgment, and polite behavior that is expected from a person who is trained to do a job well. The health profession is one of the professions that deal with human beings to keep individuals, families and communities in the nation healthy and productive.

The World Health Organization defines health as a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity. Health professions involve the application of evidence-based medicine and care to maintain human health. The nature of health professions involves the practice of promoting, maintaining, or restoring health through various disciplines. The meaning of health professions goes beyond just treating diseases; it involves a holistic approach that considers the physical, mental, and social aspects of health. Collaboration among different health professionals is often crucial for comprehensive patient care. Health professionals encompass a wide range of careers, including medicine, nursing, pharmacy, physical therapy, and more. These professionals work to diagnose, treat, and prevent illnesses and promote overall well-being.

Unit out comes

- Identify essential aspects of professionalism
- Use characteristics of professionals
- Identify the types of professionals

Key terms: profession, professionalism

1.2. Professionalism and its essential aspect

Professionalism refers to the conduct, behavior, and qualities that characterize a professional individual in a particular field or occupation. It involves adhering to ethical standards, demonstrating competence, maintaining a positive attitude, and fostering effective communication.

Professionalism does not mean wearing a suit or carrying a briefcase; rather, it means conducting oneself with responsibility, integrity, accountability, and excellence. It means communicating effectively and appropriately and always finding a way to be productive.

In a professional context, being punctual, reliable, and respectful towards others are also essential aspects of professionalism. It contributes to a positive work environment and helps build trust and credibility.

The essential aspects of professionalism encompass a range of qualities and behaviors that contribute to a person's effectiveness and credibility in a professional setting.

Characteristics of professionalism

Integrity: Upholding ethical standards and being honest and transparent in all interactions.

Reliability: Consistently delivering high-quality work on time and meeting commitments. They do what they say they will do and don't overpromise.

Respect: Professionals always treat others with respect, empathy and regardless of their position or background.

Competence: Possessing the necessary skills and knowledge to perform tasks competently and efficiently.

Adaptability: Being open to change, learning from experiences, and adjusting to new situations.

Strong communicator: A professional must have strong communication skills. This means that they not only can effectively and efficiently convey messages to others but also that they can actively listen to and understand what others are telling them.

Teamwork: Collaborating effectively with others, valuing diversity, and contributing to a positive work environment.

Professional Appearance: Presenting oneself in a manner that aligns with the expectations of the professional environment. Professionals should always strive for a professional appearance, including appropriate attire and proper hygiene and grooming.

Accountability: Taking responsibility for one's actions and decisions.

A professional accepts credit for having completed a task or achieved a goal; they also are accountable for their actions when they fail. They take responsibility for any mistakes that they make and take whatever steps necessary to resolve any consequences from mistakes

Effective time management: The health professionals know how to manage their time well is viewed by their peers as a professional.

Continuous Improvement: Seeking opportunities for growth, learning, and self-development.

These aspects collectively contribute to building a strong professional reputation and fostering a positive work culture.

Organized

A professional keeps their workspace neat and organized so that they can easily find items when they need them. All files and paperwork should be in place and, if they have to deliver a presentation, all materials should be ready well in advance so there are no unexpected delays.

Self-check questions 1.2.

1. _____ involves adhering to ethical standards, demonstrating competence, maintaining a positive attitude and fostering effective communication
2. Professionalism contributes to a positive work environment and helps build ___ and ____

1.3. Types of health professionals

Health professionals often identified with specific roles, such as doctors, nurses, therapists, or technicians, and their professional identity is shaped by their education, training, and experiences. It's a crucial aspect as it influences teamwork, communication, and patient outcomes.

A health professional, healthcare professional or healthcare worker is a provider of health care treatment and advice based on formal training and experience. The field includes those who work as a nurse, physician (such as family physician, internist, obstetrician, psychiatrist, radiologist, surgeon etc.), physician assistant, registered dietitian, optometrist, pharmacist, pharmacy technician, medical assistant, physical therapist, occupational therapist, dentist, midwife, psychologist, audiologist, or healthcare scientist, or who perform services in allied health professions. Experts in public health and community health are also health professionals.

Self-check questions 1.3.

1. List key elements of professionalism
2. What are common fields of healthcare professionals?
3. What are common roles of community health professionals?

Unit Summary

Professionalism refers to the conduct, behavior, and qualities that characterize a professional individual in a particular field or occupation.

The meaning of health professions goes beyond just treating diseases; it involves a holistic approach that considers the physical, mental, and social aspects of health.

A health professional, healthcare professional or healthcare worker sometimes abbreviated (HCW) is a provider of health care treatment and advice based on formal training and experience etc.

Health professionals often identified doctors, nurses, therapists, or technicians, and their professional identity is shaped by their education, training, and experiences.

Community health workers are health care providers who live in the community they serve and receive lower levels of formal education and training than professional health care workers such as nurses and doctors.

Unit Review questions

Instruction: Give brief answer for the following review questions:

1. Define professionalism?
2. Describe the nature and meaning of health professions?
3. List health professionals?
4. Describe community health professionals?
5. List common roles of community health professionals

UNIT 2

Health Care Systems

2.1. Introduction

The healthcare system refers to the organized structure of people, institutions, resources, and procedures intended to deliver healthcare services to meet the health needs of a population. It encompasses various components such as hospitals, clinics, health insurance, healthcare providers, and government agencies involved in health policy and regulation.

There is a variety of health systems around the world with a variety of elements, although common elements in virtually all health systems are primary healthcare and public health measures. Primary healthcare refers to the first level of contact that individuals have with the healthcare system. It is a comprehensive and accessible form of care that is designed to meet the majority of a person's health needs throughout their life. Primary healthcare typically involves a range of services, including preventive care, health promotion, diagnosis and treatment of common illnesses, and management of chronic conditions.Primary health care enables health systems to support a person's health needs – from health promotion to disease prevention, treatment, rehabilitation, palliative care and more. This strategy also ensures that health care is delivered in a way that is centred on people's needs and respects their preferences.

Unit out comes

In this unit you are dealing with the following out comes.

- Identify principles of health care system
- Promote building blocks of health care system
- Differentiate Ethiopian health system organization/tier system

Key terms: health care system, principles of health care system, building blocks of health care system

Components of primary health care:

There are 14 primary health care.

- Health education
- Availability, accessibility and affordability of health services
- Immunization against major infectious diseases
- Maternal and child health including family planning
- Providing safe water supply and sanitation
- Proper food and nutrition
- Protecting and controlling of locally endemic diseases
- Prevention and control of non- communicable diseases
- Promotion of mental health
- Provision of essential drugs
- Treatment of communicable diseases
- Oral hygiene
- Provision of medical care and emergency treatment
- Strengthening referral system

2.2. Key principles of primary healthcare

Accessibility: Services should be available to all individuals and communities, with a focus on reaching underserved populations.

Comprehensiveness: Primary healthcare addresses a wide range of health issues and aims to provide integrated and coordinated care.

Coordination: It involves the coordination of care across different healthcare providers and settings to ensure a seamless and efficient healthcare experience.

Community Involvement: Primary healthcare often involves community participation and engagement in health promotion and disease prevention activities.

Empowerment: Patients are encouraged to take an active role in their healthcare, and there is an emphasis on health education and preventive measures.

Healthcare System in Ethiopia

Ethiopia's healthcare system is organized into a three-tier structure comprising primary, secondary, and tertiary levels of care. Primary care includes health centers and health posts, emphasizing a decentralized approach. The Ethiopian government is actively working to strengthen its healthcare system, aligning it with the Sustainable Development Goals. This includes efforts to improve access to quality medicines and health services. Ethiopia faces challenges such as a predominantly rural population with limited access to essential services like safe water, sanitation, and healthcare. There is a notable urban-rural healthcare disparity

Self-check questions 2.1

1. _____ refers to the first level of contact that individuals have with the healthcare system
2. Under key elements of primary health care _____entails that services should be available to all individuals and communities, with a focus on reaching underserved populations.
3. _____ Patients are encouraged to take an active role in their healthcare, and there is an emphasis on health education and preventive measures.
4. Write the three-tier structure in Ethiopia's healthcare system

2.3.The building blocks of healthcare system

A system is a group of interacting or interrelated elements that act according to a set of rules to form a unified whole. A system, surrounded and influenced by its environment, is described by its boundaries, structure and purpose and is expressed in its functioning.

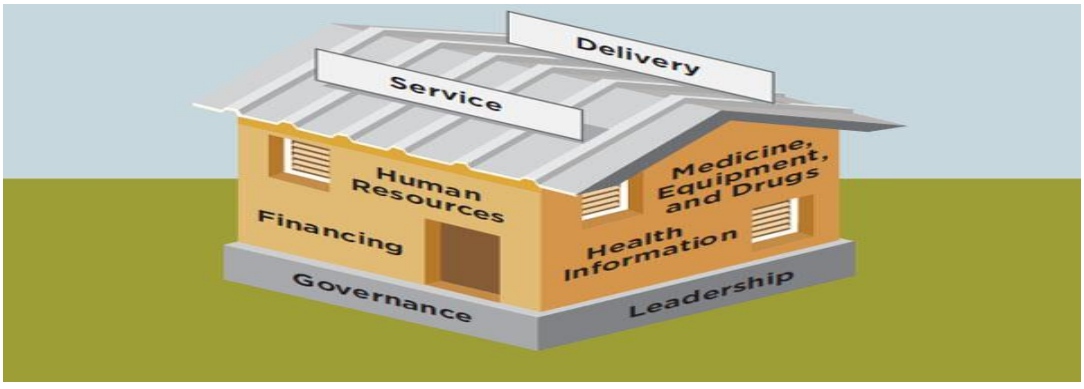

Figure 2.1: Building blocks of Healthcare System

A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct health-improving activities. A health system is, therefore, more than the pyramid of publicly owned facilities that deliver personal health services. It includes, for example, a mother caring for a sick child at home; private providers; behavioral change programs; vector-control campaigns; health insurance organizations; occupational health and safety legislation. It includes inter-sectoral action by health staff, for example, encouraging the ministry of education to promote female education, a well-known determinant of better health.

Healthcare systems can vary significantly from country to country, and even within regions of a country. Different models exist, including public healthcare systems, private healthcare systems, and hybrid systems that combine elements of both.

The fundamental building blocks of a healthcare system, as outlined by the World Health Organization (WHO), encompass six core components:

Leadership and Governance: The most critical building block, overseeing health policies and system management, ensuring effective implementation.Effective leadership and governance ensures the existence of strategic policy frameworks, effective oversight and coalition building, provision of appropriate incentives, and attention to system design, and accountability.

Service Delivery: Involves the provision of quality healthcare services to the population, ensuring accessibility and effectiveness.Good service delivery comprises quality,access,safety and coverage.

Health Workforce: Encompasses the skilled professionals required for healthcare delivery, including doctors, nurses, and support staff. A well-performing workforce consists of human resources management, skills and policies.

Medical Products, Vaccines, and Technologies: Ensures equitable access to essential medical products and technologies, critical for comprehensive healthcare.**Medical Product** procurement and supply programs need to ensure equitable access, assured quality and cost-effective use.

Health Information Systems: Involves effective data management for informed decision-making and monitoring health outcomes.A well performing system ensures the production, analysis, dissemination and use of timely and reliable information.

Health Financing: Addresses the financial aspects of the healthcare system, ensuring sustainable funding to support the delivery of services.

These building blocks provide a comprehensive framework for assessing and strengthening health systems to improve overall health outcomes. The goals of a healthcare system often include ensuring access to medical services, promoting preventive care, and managing the costs associated with healthcare delivery.A good health financing system raises adequate funds for health, protects people from financial catastrophe, allocates resources, and purchases good and services in ways that improve quality, equity, and efficiency.

2.4. Ethiopian health system organization/tier system

The Ethiopian health system is organized into different levels of care, following a decentralized approach. It is organized into a three-tier system: primary, secondary, and tertiary levels of care. Here is a general overview of the organization of the Ethiopian health system:

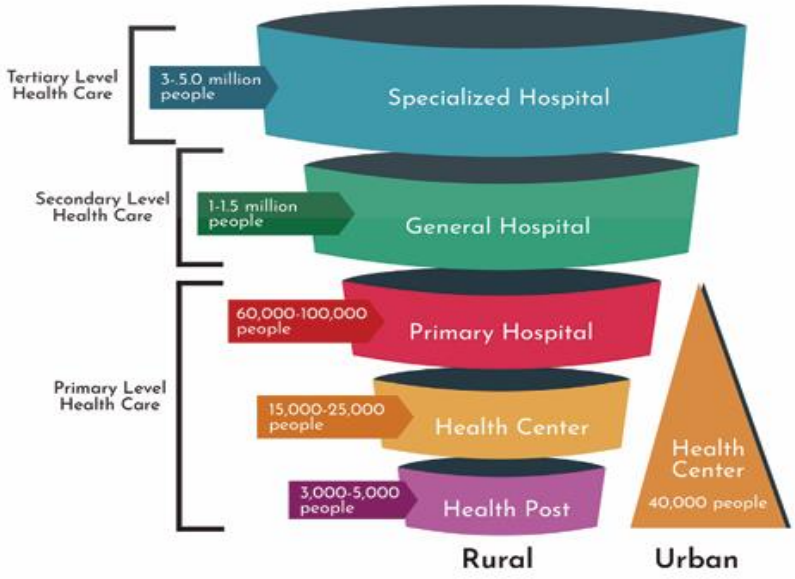

Figure 2.2. Ethiopian HealthCare Tier system

1. Primary Level of Care

Includes community health services provided through health posts. Health stations and health centers also contribute to primary care.

2. Secondary Level of Care

Secondary care is more specialized and focuses on helping patients who are struggling with more severe or complex health conditions requiring the support of a specialist. Secondary care simply means you will be taken care of by someone who has more specific expertise about your condition.

3. Tertiary Level of Care

Tertiary level is specialized hospitals that provide advanced and specialized care. They serve as referral centers for patients who require complex medical services that cannot be provided at lower-level facilities.

Ethiopia has been working on strengthening its health system to improve access to healthcare services, especially in rural areas. It has implemented initiatives such as the Health Extension Program, which involves deploying health extension workers to provide basic health services in communities.

Self-check questions 2.2.

1. _____refers to the organized structure of people, institutions, resources, and procedures intended to deliver healthcare services to meet the health needs of a population.
2. _____ is the most critical building block, overseeing health policies and system management, ensuring effective implementation .
3. _____involves the provision of quality healthcare services to the population, ensuring accessibility and effectiveness.

Unit Summary

The healthcare system refers to the organized structure of people, institutions, resources, and procedures intended to deliver healthcare services to meet the health needs of a population. Ethiopia's healthcare system is organized into a three-tier structure comprising primary, secondary, and tertiary levels of care.Primary care includes health centers and health posts, emphasizing a decentralized approach. Healthcare systems can vary significantly from country to country, and even within regions of a country. Different models exist, including public healthcare systems, private healthcare systems, and hybrid systems.

The six building blocks of healthcare systems are Leadership and Governance, Service Delivery, Health Workforce, Medical Products, Vaccines, and Technologies, Health Information Systems and Health Financing. Strengthen a health system,means improve the six health system building blocks and manage their interactions in ways that achieve more equitable and sustained improvements across health services and health outcomes.

The Ethiopian health system is organized into different levels of care, following a decentralized approach. It is organized into a three-tier system: primary, secondary, and tertiary levels of care. The goals of a healthcare system often include ensuring access to medical services, promoting preventive care, and managing the costs associated with healthcare delivery.

Unit Review questions

Instruction: Give brief answer for the following review questions:

1. Define Healthcare system
2. List all building block of healthcare system
3. List Objective of Health Care system

UNIT 3

Community health care ethics

3.1. Introduction

Professional ethics refers to ethics that enables professionals to distinguish what is right from what is wrong using morality as standard of evaluation. Professional ethics can be conceived as a parameter by which actions and behaviors of a professional can be determined as right or wrong. Health care is the application of ethics that is concerned with the vast array of moral decision-making situations that arise in the practice of medicine in addition to the procedures and the policies that are designed to guide such practice. All of the aspects of the human body, and of a human life, which are essential to one's well-being, none is more important than one's health. Health ethics promotes the consideration of values in the prioritization and justification of actions by health professionals, researchers and policymakers that may impact the health and well-being of patients, families, and communities.

Ethics are "ethos" or "ways of life" or "social norms for conduct" that distinguish between acceptable and unacceptable behaviors. Codes of conduct have long been a strong pillar in health professions, outlining the social norms, rules and responsibilities, and proper practices, of practitioners. A review of the ethical framework for community health workers and related cadres showed that ethical principles include: equal and substantial respect; justice; care; beneficence; community and cultural humility; openness; critical reflection; trustworthiness; and competency.

Unit outcomes

- Identify ethical principles
- Use legal and ethical requirements in healthcare

Key terms: ethics, codes of conduct, social norms

Start up activities 3.1

1. _____is the field of applied ethics that is concerned with the vast array of moral decision-making situations that arise in the practice of medicine in addition to the procedures and the policies that are designed to guide such practice.
2. _____ are “ethos” or “ways of life” or “social norms for conduct” that distinguish between acceptable and unacceptable behaviors.
3. ____ include: equal and substantial respect; justice; care; beneficence; community and cultural humility; openness; critical reflection; trustworthiness; and competency

3.1. Ethical principles in community Healthcare

Ethical principles in community healthcare are crucial for ensuring quality and equitable care. There are five main principles of ethics in community healthcare: autonomy, beneficence, justice, and non-malfeasance. Each patient has the right to make their own decisions based on their own beliefs and values. These principles collectively guide ethical decision-making and contribute to a compassionate and just community healthcare system.

Respect for Autonomy: Respect for autonomy is upholding individuals' rights to make informed decisions about their health. All persons have a fundamental right to self-determination. Autonomy implies an individual is master of himself/herself and he/she can act, make free choices and take decisions without the involvement of another person.

Respect for autonomy in community healthcare refers to the ethical principle that individuals have the right to make their own decisions about their healthcare, taking into consideration their values, beliefs, and preferences. This principle emphasizes the importance of informed consent, patient education, and involving individuals in the decision-making process regarding their health.

Promoting autonomy in community healthcare is crucial for fostering a collaborative and patient-centered approach to healthcare delivery. It helps build trust between healthcare providers and patients, ultimately leading to better health outcomes. However, there are pre-conditions for the application of autonomy principle, which are: Competency of a person i.e. is the capacity to be a moral agent, for example a person who is 18 years and above in Ethiopia is competent.

The principle of autonomy is based on the value of giving due regard to clients view and respecting their choices. For example, in community healthcare settings, respecting autonomy often involves effective communication between healthcare providers and patients. This includes providing clear information about diagnoses, treatment options, and potential risks and benefits. It also means taking into account the cultural, social, and personal factors that may influence a person's healthcare decisions

Justice: Health care justice involves a social ethics of care that redefines the relationship between health care, public health, and societal well-being. It encompasses distributive justice, addressing access to health care and the equitable distribution of other social goods contributing to health. Health justice is a framework and call to action for eliminating health inequities and social injustices, emphasizing strategies for a more equitable health system. It emphasizes fairness in access, treatment, and outcomes for individuals, considering diverse factors like socioeconomic status and cultural backgrounds. For example: in a community health services, Advocacy for inclusive health care policies and opposition to austerity measures are crucial components of the fight for health care justice and addressing the allocation of scarce healthcare resources and the elimination of health inequities and social injustice

Beneficence: Beneficence is defined as an act of charity, mercy, and kindness with a strong connotation of doing good to others including moral obligation. It involves actions that contribute to the welfare of others, encompassing kindness, minimizing harm, and ensuring equal services for all. In the context of clinical research, beneficence is a moral imperative for healthcare professionals, highlighting their ethical responsibility towards patients' well-being. The principles of autonomy, non-malfeasance, beneficence, and justice form the ethical foundation in biomedical practices. Overall, beneficence guides professionals to act in the best interests of their patients, promoting positive outcomes while upholding ethical standards which are promoting well-being and positive outcomes in community healthcare practices.

Non-maleficence: Avoiding harm and minimizing risks to patients during healthcare interventions. Non-malfeasance is a principle in medical ethics that emphasizes the obligation to do no harm. It is often associated with the Hippocratic Oath, where physicians pledge to prior itize the well-being of their patients and avoid any intentional harm. This principle guides healthcare professionals to weigh the potential benefits and risks of medical interventions,

aiming to minimize harm and prioritize the patient's best interests. In broader ethical contexts, non-malfeasance can extend beyond medicine, serving as a guiding principle in various fields to promote the avoidance of harm or negative consequences.

Veracity: Veracity refers to the accuracy or truthfulness of something, often used in the context of information or data. It's crucial in fields like journalism, research, and data analysis to ensure that the information presented is reliable and truthful. If you have a specific context or application in mind, feel free to let me know. It is synonymous with honesty and reliability. Veracity is crucial in maintaining trust and credibility in various contexts, from personal communication to industry data and digitalization. The term emphasizes a commitment to truth, highlighting the habitual observance of truthfulness. In a broader sense, veracity plays a pivotal role in ensuring the integrity of information and fostering transparency.

Fidelity: Fidelity in community health refers to the degree to which an intervention or program is implemented as intended. It is crucial for the successful translation of evidence-based practices. Several studies highlight the importance of fidelity in community health worker roles. For instance, a study on malaria community health workers found low fidelity, indicating poor adherence to the program's intended roles and responsibilities. Another source emphasizes the significance of prioritizing fidelity in implementation strategies to ensure effective outcomes. Implementation fidelity in community-based interventions is defined as the degree to which an intervention is delivered as intended. Assessing fidelity in community health improvement plans involves analyzing the pre-post non-experimental process evaluation. Overall, maintaining fidelity ensures the proper execution and effectiveness of community health initiatives.

Adherence to ethical principles: Adherence to ethical principles refers to the commitment and compliance with a set of moral guidelines or standards in various contexts, such as business, research, or personal conduct. Ethical principles serve as a foundation for making decisions and actions that are considered morally right and just.

Self-check questions 3.2.

1. ____is upholding individuals' rights to make informed decisions about their health.
2. ____ involves a social ethics of care that redefines the relationship between health care, public health, and societal well-being.
3. _____ is a health care moral imperative for healthcare professionals, highlighting their ethical responsibility towards patients' well-being
4. _____is a principle in medical ethics that emphasizes the obligation to do no harm.

3.2. Legal and ethical Requirements in Healthcare

Legal standards are those standards that are set forth in governmental laws. Ethical standards are based on the human principles of right and wrong. The differences between them are legal standards are based on written law, while ethical standards are based on human rights and wrongs. In healthcare, legal and ethical requirements play a crucial role in guiding practices.

Here's a concise overview:

1. **Legal Standards**
   - Legal standards define the boundaries of acceptable conduct in healthcare, often rooted in laws and regulations. They focus on human rights and wrongs, establishing what is permitted or prohibited.

2. **Ethical Standards**

   - Ethical standards are based on human principles, providing guidance beyond legal requirements. Healthcare professionals have ethical responsibilities, including the duty to protect patients and uphold moral principles. Understanding and adhering to both legal and ethical standards is essential for maintaining integrity and quality care in the healthcare industry.

Self-check questions 3.2.

1. _____are those standards that are set forth in governmental laws.
2. _____are right and wrong based on the human principles.
3. _____ is the duty to protect patients and uphold moral principles.

Unit Summary

Professional ethics refers to ethics that enables professionals to distinguish what is right from what is wrong using morality as standard of evaluation. Professional ethics can be conceived as a parameter by which actions and behaviors of a professional can be determined as right or wrong.

Ethical principles in community healthcare are crucial for ensuring quality and equitable care. There are five main principles of ethics in community healthcare: autonomy, beneficence, justice, and non-malfeasance. Each patient has the right to make their own decisions based on their own beliefs and values. These principles collectively guide ethical decision-making and contribute to a compassionate and just community healthcare system.

Legal standards are those standards that are set forth in governmental laws. Ethical standards are based on the human principles of right and wrong.

It's important for healthcare institutions to have policies and procedures in place to support and enforce ethical behavior. Additionally, ongoing education and training in medical ethics are crucial for healthcare professionals to stay informed about evolving ethical standards and principles

Unit Review Questions

Instruction: Give brief answer for the following review questions:

1. Define Ethics.
2. Define Healthcare Ethics.
3. List five main principles of Ethics in community healthcare.
4. Describe social justice by relating to health care justice.

UNIT 4

Health Care Communications

4.1. Introduction

Effective health care communication is crucial for building trust, promoting patient satisfaction, and ensuring optimal outcomes. It includes active listening, clear and simple language and empathy and compassion.

Empathy is the ability to share someone else's feelings or experiences by imagining what it would be like to be in that person's situation, whereas compassion in community health care refers to the empathetic and caring attitude healthcare professional's exhibit towards patients and community members. It involves understanding the physical, emotional, and social needs of individuals and responding with kindness and support. Compassionate care goes beyond medical treatment, emphasizing a holistic approach that considers the well-being of the whole person.

In community health care settings, compassion extends to addressing the unique challenges and circumstances that individuals and communities face. This may include factors such as socioeconomic conditions, cultural diversity, and access to healthcare resources. Compassionate healthcare providers strive to create a supportive and inclusive environment, fostering trust and collaboration between healthcare professionals and the communities they serve.

Unit outcomes

- Exercise effective healthcare communication
- Apply collaborative working relationship
- Show compassion concern of the clients
- Gathering proper information about the patient
- Perform face-to-face interactions with the client

Key terms: Empathy, Compassionate

4.2. Key principles for effective healthcare communication

Active Listening:

- Healthcare providers should actively listen to patients, paying attention to their concerns, questions, and emotions.
- Repeat back information to ensure understanding and clarify any misunderstandings.

Clear and Simple Language

- Avoid medical jargon and use clear, simple language that patients can understand.
- Use visual aids, diagrams, or models to enhance understanding.

Empathy and Compassion:

- Demonstrate empathy by acknowledging and validating patients' feelings and concerns.
- Communicate a caring attitude and show understanding of the patient's experience.

Cultural Competence:

- Be aware of and sensitive to cultural differences in communication styles and healthcare beliefs.
- Tailor communication to respect diverse cultural backgrounds.

Effective Nonverbal Communication:

- Pay attention to body language, facial expressions, and gestures to better understand patients' emotions.
- Maintain eye contact and use open body language to convey attentiveness.

Timely and Accessible Information:

- Provide timely and relevant information to patients about their health condition, treatment options, and potential outcomes.
- Ensure accessibility for patients with different literacy levels and language preferences.

Encourage Patient Participation:

- Involve patients in decision-making about their care and treatment plans.
- Encourage questions and address concerns to empower patients to actively participate in their healthcare.

Collaboration with Team Members:

- Foster effective communication within the healthcare team to ensure coordinated and comprehensive care.
- Share relevant information with colleagues to maintain continuity in patient care.

Use of Technology:

- Utilize technology to enhance communication, such as secure messaging systems, tele - health, and electronic health records.
- Ensure that patients have access to their health information and can communicate with healthcare providers through appropriate channels.

Follow-Up and Feedback:

- Provide follow-up communication to check on the patient's progress and address any ongoing concerns.
- Seek feedback from patients to continuously improve communication practices.
- By incorporating these principles, healthcare providers can enhance their communication skills and contribute to better patient outcomes and satisfaction.

Self-check questions 4.2

1. _____is crucial for building trust, promoting patient satisfaction, and ensuring optimal outcomes.
2. _____ in community health care refers to the empathetic and caring attitude healthcare professionals exhibit towards patients and community members.
3. _____is the ability to share someone else's feelings or experiences by imagining what it would be like to be in that person's situation

4.3. Establishing collaborative working relationship

Establishing a collaborative working relationship involves fostering open communication, trust, and shared goals among team members. Here are some key steps and strategies to achieve this:

- **Clear Communication:** Ensure that team members communicate openly and transparently. Establish regular meetings, use collaboration tools, and encourage an environment where everyone feels comfortable expressing their thoughts and ideas.

- **Define Roles and Responsibilities:** Clearly outline the roles and responsibilities of each team member. This helps in avoiding confusion and ensures that everyone understands their contribution to the project.
- **Set Clear Goals and Objectives:** Clearly define the goals and objectives of the collaboration. When everyone understands the purpose and direction, it helps align efforts towards a common outcome.
- **Build Trust:** Trust is crucial for effective collaboration. Encourage a culture of trust by being reliable, accountable, and supportive. Acknowledge and celebrate achievements, and address concerns promptly.
- **Promote Inclusivity:** Ensure that all team members feel included and valued. Consider diverse perspectives and encourage input from everyone to foster a more creative and innovative working environment.
- **Provide Resources:** Make sure that the team has the necessary resources, tools, and information to perform their tasks effectively. Lack of resources can hinder collaboration and productivity.
- **Conflict Resolution:** Address conflicts and disagreements promptly and constructively. Establish a process for resolving issues and encourage open discussions to find solutions that benefit the team.
- **Celebrate Successes:** Recognize and celebrate achievements, both big and small. This helps build a positive team culture and reinforces the value of collaboration.
- **Feedback Mechanism:** Implement a feedback system to continuously improve collaboration. Regularly seek input from team members on the collaborative process and be open to making adjustments based on feedback.

Team Building Activities: Organize team-building activities or events to foster stronger interpersonal relationships. This can contribute to a more cohesive and collaborative working environment. By implementing these strategies, you can contribute to the establishment of a collaborative working relationship within your team or organization.

Self-check 4.3.

1. Establishing a collaborative working relationship involves fostering open _____, _____ and _____ among team members.
2. _____ ensure that team members communicate openly and transparently.

4.4. Expressing compassion concern of the clients

To express compassion and concern for clients, it's important to communicate with empathy and understanding. Here are some phrases and tips you can use:

1. **Empathetic Statements:**
   - "I understand that this may be a challenging time for you."
   - "I'm sorry to hear that you're going through this."
2. **Acknowledgment of Feelings:**
   - "It sounds like this situation is causing you distress, and I want you to know I'm here for support."
   - "Your feelings are important, and I want to help in any way I can."
3. **Offering Support:**
   - "Please feel free to share more about how you're feeling. I'm here to listen."
   - "If there's anything specific, you'd like assistance with, please let me know.
4. **Expressing Availability:**
   - "I want you to know that you're not alone in this, and I'm here to support you."
   - "Don't hesitate to reach out if you need someone to talk to or if there's anything I can do to help."
5. **Positive Reinforcement:**
   - "I appreciate your openness in sharing your concerns. It's important for us to work together through this."
   - "Your well-being is a priority, and we'll work together to find a solution."

   Remember to tailor your response to the specific situation and individual needs of the client. The goal is to convey genuine care and understanding.

Self-check questions 4.4.

1. To express compassion and concern for clients, it's important to communicate with _____and _____
2. The phrases "It sounds like this situation is causing you distress, and I want you to know I'm here for support." Represents

4.5. Gathering proper information

Gathering proper information during communication with a patient is crucial for providing effective healthcare. Here are some key points to consider:

Active Listening: Pay close attention to what the patient is saying. Give them your full focus, and avoid interrupting. This helps in understanding their concerns and gathering relevant information.

Open-Ended Questions: Encourage patients to share more details by asking open-ended questions. Instead of yes/no questions, ask for their thoughts, feelings, and experiences to gather comprehensive information.

Empathy and Compassion: Show empathy towards the patient's situation. This not only helps in building a positive rapport but also encourages the patient to share more information openly.

Non-Verbal Cues: Pay attention to non-verbal cues such as body language and facial expressions. These can provide additional insights into the patient's emotional state and may reveal information they might not verbalize.

Clarification: If something is unclear, don't hesitate to ask for clarification. It's essential to ensure that you have a complete and accurate understanding of the patient's situation.

Patient's Perspective: Consider the patient's perspective and beliefs. Understanding their worldview helps in tailoring the communication to meet their needs and preferences.

Use of Language: Communicate in a clear and simple language, avoiding medical jargon. This ensures that the patient can easily understand the information being conveyed.

Documentation: Take thorough and accurate notes during the conversation. This information is vital for the patient's medical history and for collaborating with other healthcare professionals.

Respect Privacy and Confidentiality: Assure the patient that their information will be kept confidential. This builds trust and encourages open communication.

Follow-Up Questions: Be prepared to ask follow-up questions based on the information provided by the patient. This helps in obtaining a more detailed and comprehensive understanding of their situation.

Remember, effective communication is a two-way process, and creating a supportive and open environment is key to gathering proper information during interactions with patients.

Self-check questions 4.5.

1. Why gathering proper information during communication with a patient is crucial?
2. Instead of yes/no questions, what types of questions health professionals should ask?
3. What are body language and facial expressions?

4.6. Therapeutic communication

Therapeutic communication is a type of communication used in the healthcare field to establish a supportive and trusting relationship between healthcare professionals and patients. It focuses on enhancing the well-being of the patient by promoting open and honest communication.

Therapeutic communication involves face-to-face interactions, fostering an open environment where individuals feel free to express concerns. It encompasses verbal and non-verbal cues to establish a connection between healthcare professionals and patients, promoting effective care.

The primary objectives include understanding patients' needs, providing support, and conveying information. This approach is applicable across various disciplines, contributing to patient well-being. Therapeutic communication comprises verbal and non-verbal techniques, ensuring effective exchanges between healthcare professionals and patients and it involves active listening, empathy, respect, and non-judgmental responses.

Key components of therapeutic communication include:

1. **Active Listening:** Giving full attention to the speaker, making eye contact, nodding, and providing verbal and non-verbal cues to show understanding.

2. **Empathy:** Understanding and sharing the feelings of the patient, expressing compassion, and acknowledging their emotions without judgment.

3. **Open-ended Questions:** Encouraging patients to express themselves by asking questions that require more than a simple "yes" or "no" answer.
4. **Clarification:** Seeking clarification when information is unclear, ensuring a mutual understanding between the healthcare professional and the patient.
5. **Reflection:** Summarizing or paraphrasing what the patient has communicated to demonstrate understanding and validate their feelings.
6. **Non-Verbal Communication:**

   Paying attention to body language, facial expressions, and other non-verbal cues to better understand the patient's emotions. Therapeutic communication is essential for building trust, addressing patient concerns, and promoting a positive therapeutic relationship. It is commonly used in various healthcare settings, including hospitals, clinics, and mental health facilities.

Self-check questions 4.6.

1. _____ is a type of communication used in the healthcare field to establish a supportive and trusting relationship between healthcare professionals and patients.
2. _____ is giving full attention to the speaker, making eye contact, nodding, and providing verbal and non-verbal cues to show understanding

Unit Summary

Effective health care communication is crucial for building trust, promoting patient satisfaction, and ensuring optimal outcomes. It includes active listening, clear and simple language and empathy and compassion. In health care service delivery, establishing a collaborative working relationship involves fostering open communication, trust, and shared goals among team members

To express compassion and concern for clients, it's important to communicate with empathy and understanding. Empathy is the ability to share someone else's feelings or experiences by imagining what it would be like to be in that person's situation, whereas compassion in community health care refers to the empathetic and caring attitude healthcare professionals exhibit towards patients and community members.

Therapeutic communication is a type of communication used in the healthcare field to establish a supportive and trusting relationship between healthcare professionals and patients. It focuses on enhancing the well-being of the patient by promoting open and honest communication. Therapeutic communication involves face-to-face interactions, fostering an open environment where individuals feel free to express concerns. It encompasses verbal and non-verbal cues to establish a connection between healthcare professionals and patients, promoting effective care.

The primary objectives include understanding patients' needs, providing support, and conveying information. This approach is applicable across various disciplines, contributing to patient well-being. Therapeutic communication comprises verbal and non-verbal techniques, ensuring effective exchanges between healthcare professionals and patients and it involves active listening, empathy, respect, and non-judgmental responses.

Unit review questions

1. Discusses effective healthcare communication
2. Define compassion and empathy
3. List some key points to consider while gathering proper patient information
4. Discusses therapeutic communication with its objective in healthcare

UNIT 5

Humanistic Care to Clients

5.1 Introduction

Humanistic care focuses on the holistic well-being of individuals, emphasizing empathy, compassion, and understanding in healthcare settings. It values the personal and emotional aspects of patient care, aiming to treat individuals with dignity and respect rather than just addressing medical symptoms. This approach considers the patient's unique needs, preferences, and values, fostering a more compassionate and patient-centered healthcare experience. Humanistic care often involves effective communication, active listening, and involving patients in decision-making processes to enhance the overall quality of care.

Unit out comes

- Provide humanistic care to clients
- promote humanistic care to clients
- Identify elements of humanistic care

Key words empathy, holistic, compassion

5.2 Provision of Humanistic care

Humanism, the ideology that sparked the Renaissance, places a high value on human beings, human culture and the human experience. Today, humanism in health care reminds us that illness and recovery and living and dying are an integral part of the whole human experience.

5.2.1. Empathy: Empathy is the ability to understand the personal experience of the patient without bonding with them, constitutes an important communication skill for a health professional, one that includes three dimensions: the emotional, cognitive, and behavioral.
In community health care, empathy plays a crucial role in building strong connections between healthcare providers and the community members they serve.

It involves understanding and sharing the feelings of individuals, fostering trust, and promoting a patient-centered approach to care.

Empathetic healthcare providers are better able to address the unique needs and challenges of diverse communities, leading to more effective and inclusive healthcare practices. This approach not only improves patient satisfaction but also contributes to better health outcomes and overall community well-being.

5.2.2. Privacy: Privacy in community health care is a crucial aspect to ensure individuals feel secure when seeking medical assistance. It involves protecting sensitive information related to patients, such as medical history, treatment records, and personal details. In community health care in Ethiopia, privacy is safeguarded through various measures:

Regulatory Oversight: The Ethiopian government, through agencies like the one responsible for public health, ensures the safety and quality of health services, emphasizing privacy.

Electronic Health Information Systems: The acceptance of electronic community health information systems is nearly universal, showcasing a positive attitude towards technology in ensuring privacy.

Community-Based Health Insurance Scaling Up: The implementation of community-based health insurance (CBHI) is part of Ethiopia's efforts towards universal health coverage, contributing to privacy protection.

Patient Perception of Health Information Security: Research assesses and analyzes patient perceptions of health information security in selected public and private hospitals, highlighting the importance of privacy concerns among patients.

Legal Compliance: Organizations like Your Community Health in Ethiopia prioritize privacy and confidentiality, adhering to privacy legislation to protect client information.

5.2.3. Confidentiality: Confidentiality refers to the duty of health care providers to keep patient information private and secure, treating it with respect. In Ethiopia, confidentiality in community health care is crucial for maintaining trust and promoting open communication between healthcare providers and patients. The country has been working on improving healthcare services, including emphasizing the importance of privacy and confidentiality.

Ethiopia's healthcare system faces challenges, but efforts have been made to enhance confidentiality through training healthcare professionals and implementing guidelines.

The Ethiopian Ministry of Health plays a key role in developing and enforcing policies to ensure patient confidentiality is prioritized.

It's essential to consider cultural and social aspects while addressing confidentiality in community health care in Ethiopia, as these factors can influence perceptions and practices. Continuous efforts are being made to align healthcare practices with international standards, and collaborations with organizations such as the World Health Organization contribute to this progress.

5.2.4. Respect: Respect in community health care is crucial for fostering a positive environment and quality patient care. It contributes to a high-performance organization and ensures patients feel cared for. Displaying respect for patients is foundational in nursing care, involving intentional acts of consideration. Patient perspectives highlight that respect is foundational to genuine relationships and strengthens clinicians' moral commitment. Embracing a culture of respect in healthcare positively impacts patient care delivery, enabling providers to offer services respectfully. Respecting communities is an ethical principle in health justice, recognizing their essential role in public health.

5.2.5. Right: In community health care, individuals have rights and practitioners have obligations to ensure their well-being. Here's a concise overview:

Patient Rights and Ethics: Clear patient rights are crucial for standardized healthcare, fostering uniform expectations during care.

Diverse Patient Groups: Community Health Centers commit to respecting human rights and dignity, providing care to diverse patient groups within surrounding communities.

Your Rights and Responsibilities: Patients are entitled to considerate, quality, and safe care regardless of various factors. It emphasizes the right to respectful care irrespective of individual characteristics.

The Right to Health: Everyone holds the right to health, encompassing access to a certain standard of health and healthcare. This extends to both individuals and the responsibility of the State.

Self-check questions 5.2.

1. Emphasis areas of humanistic care in healthcare are _____ and _____
2. _____ is the ideology that sparked the Renaissance, places a high value on human beings, human culture and the human experience
3. _____ is the ability to understand the personal experience of the patient without bonding with them
4. _____ is a crucial aspect to ensure individuals feel secure when seeking medical assistance
5. _____ showcases a positive attitude towards technology in ensuring privacy

Unit Summary

Humanism, the ideology that sparked the Renaissance, places a high value on human beings, human culture and the human experience

In health care, Humanism reminds us that illness and recovery and living and dying are an integral part of the whole human experience.

Humanistic care focuses on the holistic well-being of individuals, emphasizing empathy, compassion, and understanding in healthcare settings.

Unit Review Questions

Instruction: Give short answers for the following review questions:

1. _____ is the ability to understand the personal experience of the patient without bonding with them
2. _____ is community health care crucial aspect to ensure individuals feel secure when seeking medical assistance.
3. _____ is crucial for maintaining trust and promoting open communication between healthcare providers and patients
4. _____ contributes to a high-performance organization and ensures patients feel cared for

UNIT 6

Ethical and Professional Decision Making

6.1. Introduction

This unit discusses the fundamental factors of ethical decision-making frameworks and theories. Ethical decision-making is the process by which you aim to make your decisions in line with a code of ethics. To do so, you must seek out resources such as professional guidelines and organizational policies and rule out any unethical solutions to your problem. Making ethical decisions is easier said than done.

Ethical decision-making is often guided by ethical frameworks or theories, such as utilitarianism, deontology, virtue ethics, or the principle of respect for persons. It requires critical thinking, empathy, and consideration of various perspectives to arrive at a well-reasoned and morally justifiable decision. Ethical decision-making refers to the process of evaluating and choosing among alternatives in a manner consistent with ethical principles. In making ethical decisions, it is necessary to perceive and eliminate unethical options and select the best ethical alternative. Integrity, respect, responsibility, fairness, compassion, courage, and wisdom are the seven principles of ethical decision-making.

Learning outcomes

After training this unit, you will be able to:

- Identify mechanisms for ethical decision-making.
- Explain the important principles for making ethical decisions.
- Mention some steps to ethical thinking and ethical behavior.
- Identify the factors that impact professional and ethical decision-making.
- List out industry compliance and regulations.

Key Terms: Rationalization, philosophy, induction, deduction, monitoring, value of nature, empathy, procedure, respect, recruitment, safety, and compliance

6.2. Ethical Decision Making

Ethical decision-making is a critical process that involves carefully considering various options and choosing the best alternative based on ethical principles. Ethical decisions are grounded in trust, responsibility, fairness, and caring. This requires reviewing different possibilities, eliminating those with an unethical standpoint, and selecting the most ethical choice. Importantly, ethical decisions are consistent with good citizenship and set the ground rules for behavior.

Ethical decision-making is particularly important in the workplace, where workers are expected to make sound, ethical choices. Ethical decisions are necessary to deal with conflicting duties, loyalties or interests, and should be made based on established rules, regulations, procedures, and practices.

Effective ethical decision-making requires a trained sensitivity to ethical issues and a practiced method for exploring the ethical aspects of a situation and weighing the considerations that should guide the chosen course of action.

Ethical decision-making is often informed by ethical frameworks or theories such as utilitarianism, deontology, and virtue ethics. Utilitarianism focuses on actions that foster happiness and well-being for the greater good, while deontology emphasizes following universal moral rules.

Virtue ethics centers on cultivating moral character. Ultimately, ethical decisions should be fully informed, aware of relevant laws and principles, consciously and reflectively deliberated, intelligently justifiable, and effectively implemented.

The key is to base decisions on truth, morally accepted facts, and universal ethical principles like trustworthiness, respect, responsibility, fairness, caring, and good citizenship, rather than self-interest or easy returns. Before making any decision, the responsible person should consider accurate and comprehensive information, relevant policy and legislation, and seek advice from professionals in the given area.

In making ethical decision, it is necessary to:

- Notice and eliminate unethical options -right vs. wrong. Ethical thinking requires a sensitivity to perceive the ethical implications of decisions.

- Evaluate complex, ambiguous and incomplete facts. It is often difficult to obtain all necessary information.
- Select the best ethical alternative. Resolve any ethical dilemmas-right vs. wrong. Not all ethical responses to a situation are equal.
- Have ethical commitment, ethical consciousness, and ethical competency. Ethical thinking and decision making takes practice

Self check questions 6.2

1. What is decision making?
2. What points should be considered when ethical decision making is conducted?

6.3. Some Steps to Ethical Thinking and Ethical Behaving

Steps in ethical thinking and behaving include the following:

- Clarify/ identify the relevant facts of the case/: Determine precisely what must be decided. What are the alternatives? Eliminate any impractical, illegal or improper alternatives.
- Assess/ identify the relevant ethical principles /- Separate facts from beliefs, desires, theories and opinions. Assess the influence of personal and/or collective world views on assumption about fact. Assess the credibility of the sources of information and the motivations of the stakeholders.
- Decide/. Identify other relevant ethical principles and resolve conflicts between them /- Are there some right vs. wrong choices? Classify any ethical dilemmas involving right vs. right choices and evaluate the viable alternatives by prioritizing the ethical values so that you can choose which values to favor.
- Implement/ Decide on ethical principles and standards which are relevant to the case at hand - Develop a plan to implement your decision in a way that maximizes the benefits and minimizes the costs and risks. Involve as many stakeholders as possible during implementation.
- Monitor/ Reconsider any remaining conflicts between the case and ethical principles and standards. /- Monitor the effects of decisions and be prepared to take alternative action based on new information.

- Reflect/ identify whether the decision would withstand public security, and finally make decisions/ - Review your decision making process.

Will I do it differently next time? Were you fully aware of your own values and worldview during the process? What feedback should you seek?

6.3.1. Important principles for making Ethical decision:

- **Empathize with another**. Put yourself in the other person's shoes and understand how they are feeling. Treat other people the way you would like to be treated.
- **Demonstrate selflessness**. Do not be selfish and put yourself before others. Do the right thing even when it might not be what you really want to do.
- **Be fair**. Ethical people are compassionate and caring. They are always honest and fair when dealing with others. Respect another's opinions and choices even when you disagree with them.
- **Value nature**. Do not view it as only a resource for sustaining life, but as a life force in and of itself.
- **Act responsibly**. Be a trustworthy and responsible person that others can rely on.

The seven steps of ethical decision making as follows:

- Determining whether there is an ethical dimension to the issue requiring a decision.
- Collecting relevant information for ethical analysis.
- Evaluating information collected on the basis of whether the decision to be made will be in compliance with established regulations and values.
- Considering alternatives that can be made in the process to ensure the decision and the result are ethical.
- A decision should be made and implemented after the considerations.
- The final step is the review of the consequences resulting from the decision.

6.3.2. Factors that affect Professional and Ethical Decision

The code of ethics usually includes the six universal moral values that state you expect employees to be:

Trustworthy: Worthy of confidence specifically: being or deriving from a source worthy of belief or consideration for evidentiary purposes a trustworthy informant.

Respectful: Respect for persons may perhaps be the most fundamental principle in all of ethics. Respect (full) calls on each and every one of us to respect the intrinsic dignity of all other people. If something is intrinsic to us, it is essential to our being and cannot be earned. It is a property of being a person.

Responsible: Responsibility is an ethical concept that refers to the fact that individuals and groups have morally based obligations and duties to others and to larger ethical and moral codes, standards and traditions.

Fair: Fairness is concerned with actions, processes, and consequences, which are morally right, honorable, and equitable. In essence, the virtue of fairness establishes moral standards for decisions that affect others. Fair decisions are made in an appropriate manner based on appropriate criteria.

Caring: The ethics of care is a normative ethical theory that holds that moral action centers on interpersonal relationships and care or benevolence as a virtue.

Good citizens: Celebrating diversity and differences; go to local ethnic festivals and introduce your child to friends who represent a variety of lifestyles, cultures and religions.

6.4. Workplace policies and procedures

- Code of conduct.
- Recruitment policy.
- Internet and email policy.
- Mobile phone policy.
- Non-smoking policy
- Drug and alcohol policy.
- Health and safety policy.
- Anti-discrimination harassment policy

Self check questions 6.3

1. Mention the factors that affect professional and ethical decision

6.5. Industry compliance and regulations

Disciplinary Actions in Professional Practice:

Professional practice is guided by legal and ethical documents such as standards of practice, codes of ethics, practice guidelines, regulations, and bylaws. These set the standards for ethical behavior and decision-making within a given field. However, ethical decision-making can be influenced by a variety of individual, organizational, and opportunity factors.

Individual factors, such as personal values, beliefs, and character traits, can significantly impact whether decisions are made ethically or unethically.

Organizational factors, including the shared values, norms, and general culture within a workplace, also play a major role. If an organization fosters an environment where unethical decisions are the norm, it can be very challenging for individual employees to consistently make ethical choices. Additionally, opportunity factors - situations that encourage or discourage ethical versus unethical actions - can sway decision-making.

Ultimately, professionals are expected to make decisions that align with established practice standards, regardless of the individual, organizational, or situational influences at play. Upholding ethical principles is a critical responsibility for anyone in a professional role.

Unit Summary

Ethical decision-making is a critical process that involves carefully considering various options and choosing the best alternative based on ethical principles. Ethical decisions are grounded in trust, responsibility, fairness, and caring. This requires reviewing different possibilities, eliminating those with an unethical standpoint, and selecting the most ethical choice. Importantly, ethical decisions are consistent with good citizenship and set the ground rules for behavior.

Ethical decision-making is particularly important in the workplace, where workers are expected to make sound, ethical choices. Ethical decisions are necessary to deal with conflicting duties,

loyalties or interests, and should be made based on established rules, regulations, procedures, and practices. Effective ethical decision-making requires a trained sensitivity to ethical issues and a practiced method for exploring the ethical aspects of a situation and weighing the considerations that should guide the chosen course of action.

Ethical decision-making is often informed by ethical frameworks or theories such as utilitarianism, deontology, and virtue ethics. Utilitarianism focuses on actions that foster happiness and well-being for the greater good, while deontology emphasizes following universal moral rules. Virtue ethics centers on cultivating moral character. Ultimately, ethical decisions should be fully informed, aware of relevant laws and principles, consciously and reflectively deliberated, intelligently justifiable, and effectively implemented.

The key is to base decisions on truth, morally accepted facts, and universal ethical principles like trustworthiness, respect, responsibility, fairness, caring, and good citizenship, rather than self-interest or easy returns. Before making any decision, the responsible person should consider accurate and comprehensive information, relevant policy and legislation, and seek advice from professionals in the given area.

Unit review questions

Direction 1- Write Short Answer for the Following Question

1. List down the universal moral values that are expected from an employee.
2. Identify some steps to ethical thinking and ethical behavior.
3. Explain the important principles for making ethical decisions.
4. Identify the factors that impact professional and ethical decision-making.
5. Identify workplace policies and procedures.
6. List out industry compliance and regulations.

Answers for self check questions

Unit 1 Self-check answers

Self-Check 1.2.

1. Professionalism
2. Trust and credibility

Self-Check 1.3

1. Integrity, Reliability, Respect, Competence and Adaptability
2. Physician, physician assistant, Nurse, pharmacist, pharmacy technician
3. The promotion of healthy behavior among individuals and households; the provision of agreed-upon basic health services; and. the facilitation of community diagnosis, management, and referral.

Unit 2 Self-check answers

Self-check 2.1

1. Primary Healthcare
2. Accessibility
3. Empowerment
4. primary, secondary, and tertiary levels of care

Self-check 2.2.

1 Healthcare system

2. Leadership and Governance
3. Service Delivery

Unit 3 Self-check answers

Self-check 3.1

1. Healthcare ethics
2. Ethics
3. Ethical principles

Self-check 3.2

1. Respect for Autonomy
2. Health care justice
1. Beneficence

2. Non-Malfeasance

Self-check 3.3

1. Legal standards

Unit 4 Self-check answers

Self-check 4.2

1. Effective health care communication
2. Compassion
3. Empathy

Self-check 4.3

1. Communication, trust, and shared goals
2. Clear communication

Self-check 4.4

1. Empathy and understanding
2. Acknowledgment of Feelings

Self-check 4.5

1. Gathering proper information during communication with a patient is crucial for providing effective healthcare
2. Instead of yes/no questions, ask for their thoughts, feelings, and experiences to gather comprehensive information
3. Non-Verbal Cues

Self-check 4.6

1. Therapeutic communication
2. Active listening

Unit 5 Self-check answers

Self-check 5.2.

1. Empathy and compassion
2. Humanism
3. Empathy
4. Privacy

5. Electronic Health Information Systems

Unit 6 Self-check answers

Self check 6.2

1. Ethical decision-making is the process by which you aim to make your decisions in line with a code of ethics.

2. Notice and eliminate unethical options

   Evaluating complex, ambiguous and incomplete facts

   Selecting the best ethical alternative

   Have ethical commitment, ethical consciousness, and ethical competency.

Self check 6.3

1. Trustworthy, Respectful, Responsible, Fair, Caring and Good citizens:

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Module II

Infection Prevention Techniques

CONTENTS

UNIT 1

Carrying Out Infection Prevention Techniques

1.1. Introduction

Infection prevention is a practical, evidence- based approach preventing patient and health care workers from being harmed by avoidable infection. It is a process of placing protective barriers such as: physical, chemical and mechanical between susceptible host &diseases causing agents.

Learning Outcomes:

After the accomplishing this unit the students will be able to:

- Identify principles of infection prevention
- Identify sources of infection
- Describe infection prevention measures
- Identify infection prevention standards

  Key terms: infection, health care workers, safety, microorganisms

1.2. Overview of infection prevention

Dear students! *Do you have any information about the infection and how infectious diseases transmitted from person to person?*

Healthcare-associated infections (HCAI) are infections that are acquired in healthcare facilities as a result of healthcare interventions and are a major problem for patient, health workers and other members of the community who are visiting health institutes for different reasons.

Healthcare workers have a great role in the prevention and control of infection at all levels of care. The nature of health work increases the risk of acquiring or transmitting infectious agents.

The goal of infection prevention and patient safety is to make healthcare facilities safe for patients, health workers, non-clinical staffs and the community who are living in neighbor of health care institutes.

Understanding how infections spread

Knowing how infections spread and understanding the factors those contributing and facilitating the spread of infectious agents is important in developing appropriate prevention approaches. Infection in health care setting are occurred as a direct result of treatment and service delivery process in any health institute and healthcare delivery in the community.

Microorganisms: are causative agents of infections such as bacteria, viruses, fungi and protozoa. They can exist naturally everywhere in the environment. Most microorganisms do not cause infection but those which are known pathogenic microorganisms are causing infection. Microorganisms can be involved in causing either colonization or infection, depending on the susceptibility of the host. Host susceptibility may be increased for several reasons, e.g. impaired immunity, age, pre-disposing medical conditions, clinical interventions etc.

Definition of common terms

The terms contamination, colonization and infection are used to describe different stages involving microorganisms. It is important to have a clear understanding of the differences between these terms as it will help you make a decision with regard to care plans.

Contamination: often referred to as surface microorganisms. We can describe a piece of equipment as being ‘contaminated’, or the hands of healthcare workers as being ‘contaminated’. In itself contamination causes no harm, but if, a piece of equipment contaminated with a microorganism is used by a person without treatment there is a risk of that microorganism spreading to a person.

Colonization: colonization occurs where there is a sustained presence of a replicating microorganism on or in the body, without causing infection or disease. For example, a service user with an indwelling urinary catheter may have bacteria (e.g. Escherichia coli) in their bladder, meaning they are colonized with a microorganism but has no symptom of infection.

Infection: is the condition when infectious microorganisms invade the body and there is an immune response, with or without symptomatic disease, results. Signs and symptoms of infection will vary depending on the site of the infection, and the individual response of the person infected.

Infection Chain/Cycle

The spread of an infection within a community is described as a "chain," several interconnected steps that describe how a pathogen moves about.

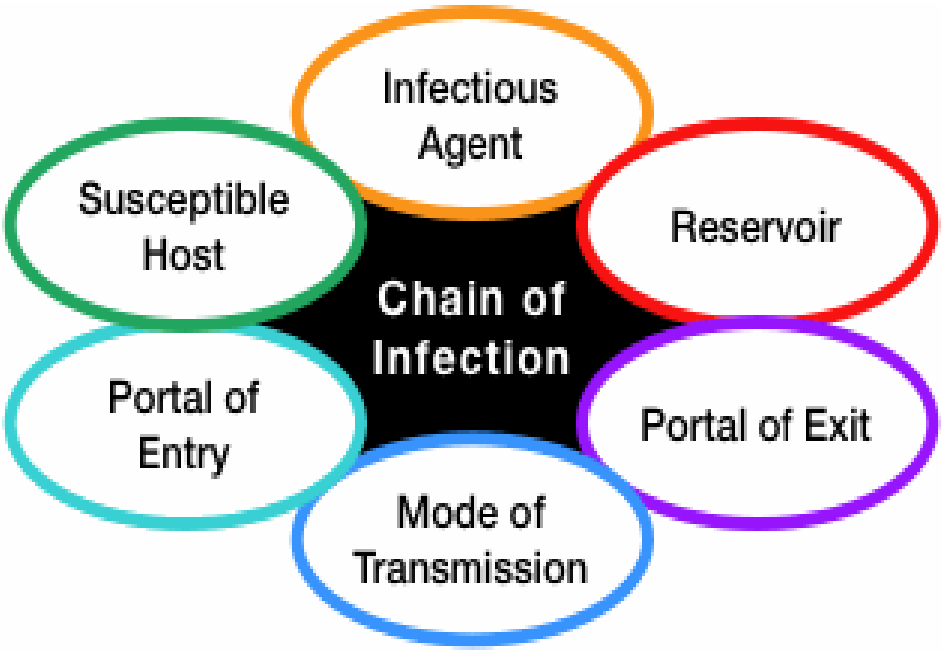


Figure 1.1**:** Components of infection chain/cycle

Elements of The Chain Of Infection

There are six basic elements in chain of infection. These are: infectious agent, reservoir, portal of exit, mode of transmission, portal of entry and susceptible host. Each element are required for an infection to occur and spread as shown by the chain of infection illustrated above in figure 1.1. Each element is described below:

- **Infectious Agent** - are organism including bacteria, virus, fungus, parasites which can **cause infection or an infectious disease**.
- **Reservoir-** is the habitat in which an infectious agent normally lives, grows, and multiplies. Reservoirs include humans, animals, and the environment.
- **Portal of exit**- is a gateway through which the agent leaves the host or reservoir.
- **Mode of transmission** - an agent which exits and develops in its natural reservoir can be transmitted in numerous ways to a susceptible host and get portal of entry. These modes of transmission are classified as:

  Direct Transmission - refers to an immediate transfer of the agent from a reservoir to a susceptible host through direct contact or droplet.

  Indirect Transmission - an agent is carried from a reservoir to the susceptible host by suspended air particles, vectors and vehicles.

  - **Portal of entry**- is the gate way through which an infectious agent enters in to the susceptible host. These portals of entry could be mouth, nose, skin etc.
  - **Susceptible host**- is human being or animal which is liable to take up infectious agents/pathogens and harbors them.

Breaking the Chain of Infection

Preventing the spread of infectious agents control practice requires breaking the chain of infection by removing one or more of the conditions necessary for transmission of the diseases from the reservoir to the susceptible host through practices which;

- Reduce the number of microorganisms present (e.g. hand washing, cleaning of instruments)
- Kill, inhibit or inactivate microorganisms (e.g. hand washing with a waterless alcohol preparation, decontamination of patient care items);
- Create barriers to prevent infectious agents from spreading (e.g. wearing gloves or personal protective equipment);
- Reduce or eliminate risky practices (e.g. by using hands-free technique in the operation room, using gloves and disposable syringes etc.)
- Immunizing susceptible hosts to develop immunity

Self –check question 1.2

1. List basic elements in chain of diseases transmission, and give brief description of each

1.3. Principles of Infection Prevention

Infection prevention and control (IPC) strategy is designed to break the chain of infection. The intervention targeted at the specific links of transmission chain. The guideline issued by the CDC in 1996 involves two level approaches.

Standard precautions: which are the basic set of infection prevention and control strategies which are implemented in health facilities in all times.

Transmission-Based Precautions: are set of IPC intervention for certain highly infectious diseases.

1.3.1. Standard precautions

Standard precautions are the minimum infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where health care is delivered. The aim of standard precautions is to reduce the risk of transmitting microorganisms from known or unknown source of infection within health care settings.

Key Principles of Standard Precaution:

- Consider every client and patient as potentially infectious or susceptible to infection.
- Apply to all patients and clients attending health care facility.
- Apply to all blood, body fluid, secretion, execration (except sweat), mucous membrane and no intact skin.
- The components of Standard Precautions create protective barriers for preventing infections in visitors, patients, and HCWs and are based upon the premise that every person (patient, visitor, or HCW) is potentially infectious and susceptible to infection.

Every person working within a healthcare facility should familiarize themselves with all Standard Precautions and ensure they are compliant at all times.

1.3.2. Transmission-Based Precautions (TBP)

Transmission-Based Precautions (TBPs) are intended for use in patients known or highly suspected of being infected or colonized with pathogens transmitted by:

- Air (tuberculosis, chicken pox, measles, etc)
- Droplet (flu, mumps and rubella); or
- Contact (hepatitis A or E and other enteric pathogens, herpes simplex and skin or eye infections).

Self check 1.3

1. Is the aim of standard precautions to reduce the risk of transmitting microorganisms from known source of infection only? If your answer is true or false what is the reason for your answer?

1.4. Source of Infection

Source of the infection is an object one in which the agent of infection lives and propagates. It can be human being or animal from which the infectious agent is secreted into the environment and from there to individuals.

1.4.1. Human, as a source of infection

A person can be a source of infection in the following cases:

- **During the incubation period of a disease**-some infectious agents can be secreted during incubation period. For example, Hep A and B.
- **Sick man**- a person with clinical symptom of infection can be a source of infection
- **Convalescent**- a person cans secret infectious agents during recovery time.
  Example pertussis
- **Carriers**- a person can also secret infectious agents after complete recovery of specific diseases.
  Example typhoid fever

1.4.2. Environment as a source of infection

Many infectious agents can live in the environment which has favorable for multiplication. Microorganisms inhabits in air, soil, water and other physical maters in the environment. When human being has a contact with these environmental components for different purpose infectious agents can enter into the body and can cause any specific diseases.

1.4.3. Animal as a source of infection:

Communicable diseases can also become transmitted from infected man to susceptible host in health care setting by animal hosts. Animals such as dogs and cats as well as vectors such as flies and rodents which have contact with diseases casing agents can disseminate communicable diseases in health care setting.

Self –check question 1.4

1. What are the sources of infection for diseases in health care setting?

1.5. Infection prevention measures

The following standard precautions and transmission-based Precautions are the basic measures to prevent the infection in health care setting.

1.5.1. Standard precautions as prevention methods

As we discussed early standard precaution is the infection prevention practices that apply to all patient care to reduce the risk of transmitting micro-microorganisms form known or unknown source infection within health care settings.

Components of Standard Precautions:

- Hand Hygiene
- Use of personal protective equipments(PPE): use appropriate PPE for the level of care being given or the potential infection risk associated with an activity, even when there is no known risk of infection.(example glove, mask, eye wear etc.)
- Respiratory hygiene and cough etiquette

- Injection Safety and sharp injury prevention
- Sterilize instruments and devices
- Safe handling of linen and laundry
- Cleaning and disinfecting environmental surface
- . Healthcare waste Management

Hand hygiene

Hand hygiene is the single most important infection prevention and control (IPC). It includes; hand washing, hand antisepsis, antiseptic hand rub and surgical hand antisepsis. The purpose of hand washing is to remove soil and debris from skin and reduce the number of transient microorganisms mechanically. The failure to perform appropriate hand hygiene is considered to be the leading cause of **health care-associated infections** and the spread of multi drug-resistant microorganisms and has been recognized as a significant contribute to outbreaks.

Hand washing: is the rubbing together of all surfaces hands by using safe water, soap and other detergents. Vigorous scrubbing with warm water and soap for at least 15 seconds is important practice to prevent the transmission of micro-organisms.

When to wash hands (critical situations to wash hands):

- Immediately after arriving at and leaving work(the health facility)
- Before and after examining(coming direct contact with)a client/patient
- After touching contaminated instruments or items
- After exposure to mucous membranes, blood, body fluids, secretions or excretions
- Before putting on (wearing) gloves and after removing them (putting off)
- After blowing nose or covering a sneeze
- Before eating or serving food
- Whenever our hands become visibly soiled
- Before and after cleaning the environment
- After visiting toilet

Hands should be washed with soap and clean water or an antiseptic hand rub after removing gloves, because the gloves may have tiny holes which might pass microorganisms and it might be also torn

while using it. This condition gives a chance for grow of bacteria rapidly on gloved hands due to the moist and warm environment within the glove.

How to wash our hands

Steps for routine hand washing: Before starting hand washing practice think a moment about parts of hands usually neglected while washing. Parts of hands usually neglected while washing are; finger tips, palm of hands, back of hands and thumbs.

Figure 1.2. Parts of hands usually neglected while washing.

Hand washing procedures:

- Prepare all the materials needed such as: clean hand towel, soap, sink, running water, nail brush, orange stick and tissue
- Assess hands for cuts and breaks
- Remove jewelries and wrist watch, etc.
- Do not touch any part of the sink and don't let your clothes touch the sink.
- Open the faucet and adjust the flow of water.
- Wet hands and lower forearms under running water. Keep hands in downward position.
- Get the soap and lather thoroughly. Rinse the soap and return it to the soap dish.
- Place one palm over the other working the soap into lather.
- Rub your hands palm to palm, fingers interlaced.

- Rub back fingers to opposing fingers interlocked. Be sure to get underneath the fingernails
- Rotate the right thumb in a rotational manner clasped in left palm and vice versa.
- Rub backwards and forwards while rotating with tops of fingers and thumb of right hand in left and vice versa.
- Brush your nails using nailbrush and remove the debris under the nails using orange stick. Rinse and return them to proper places.
- With hands in downward position, rinse starting from the wrist to fingers.
- Get a towel and dry your hands from fingers to forearms.
- Close the faucet using clean tissue or using your elbow.

Hand Washing Technique

Hand Washing technique with soap and water:

- Wet hands with water
- Apply enough soap to cover
- Rub hands palm to palm all hand surfaces
- Right palm cover left dorsum withInter locked fingers and vice versa
- Palm to palm with fingers Inter locked
- Backs of fingers to opposing palms with finger inter locked
- Rotational rubbing of left t humb clasped in right palmand vice versa
- Rotational rubbing, backand forwards withclasped fingers of right hand left palmand vice versa
- Rinse hands with water
- Dry thoroughly with a single used towel
- Use towel to turn off faucet
- Your hands are safe

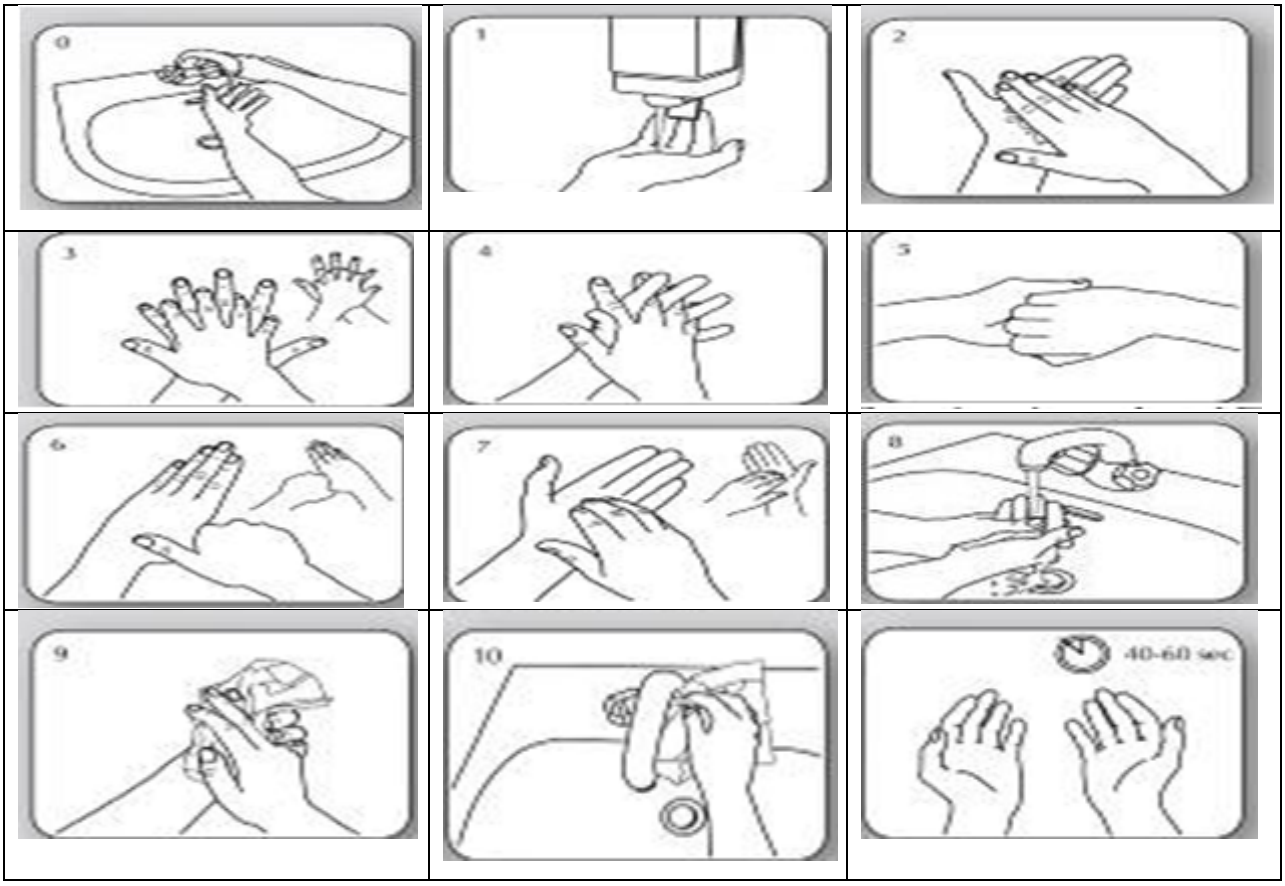


Figure 1.3: Hand washing technique with soap and water

Hand Antisepsis:

The purpose of hand antisepsis is to remove soil and debris and reduce both **transient** and **resident** flora on the hands. The technique for hand antisepsis is similar to hand washing **except** that it involves use different types of soap containing an antimicrobial agent. Hand antisepsis should be done before:

- Examiningorcaringforhighlysusceptiblepatients(e.g.prematureinfants,elderlypatients, patients with advanced AIDS)
- Performing an invasive procedure such as placement of an intravascular device

- Leaving the room of patients on contact precautions (e.g. with hepatitis A or E)or who have drug-resistant infections.

Anti septic hand rub:

Antiseptic hand rub is a process of disinfecting hands in appropriate time and condition to make hand free from infectious agents. Antiseptic hand rub is more effective in killing **transient** and resident flora than plain or medicated soap and water. Hand rubs contain a small amount of an emollient such as glycerin, propylene glycol or sorbitol that protects and softens skin.

The advantages of antiseptic hand rub over hand washing with soap and water are:

- Require less time.
- Act faster
- Are more accessible than sinks.
- Are more effective for standard hand washing than soap.
- Can provide improved skin condition.

A non-irritating, antiseptic hand rub can be made at home and institution level by adding glycerin, propylene glycol or sorbitol to alcohol (2mLin100mL of 60 to 90 percent ethyl or isopropyl alcohol solution) .

The technique for performing antiseptic hand rub is as follows:

Before applying the procedure you should be sure that your hand is relatively clean. If hands are visibly soiled, hand washing with water and detergent should be done first. Apply the following procedures:

- Apply enough (5mL) alcohol-based hand rub to cover the entire surface of hands and fingers.
- Rub the solution vigorously into hands, especially between the fingers and under the nails until dry(for 15 to 30 seconds).
- Do not rinse hands after applying hand rubs.

This type of hand hygiene process is performed for invasive surgical procedures in hospitals. The purpose of surgical hand scrub is to mechanically remove soil, debris and transient organisms and to reduce resident flora prior to performing any surgical procedure and for the duration of the procedure. The goal is to prevent wound contamination by microorganisms from the hands and arms of the surgeon and assistants if there is a break in the integrity of the gloves or gown.

Self –check questions (Hand hygiene)

1. List the parts of hands usually neglected while we perform hand hygiene
2. Perform hand washing by considering each step you have learnt early.
3. Perform anti septic hand rub practically by considering each step you have learnt early

Use of Personal Protective Equipment's

Personal protective equipment refers to a range of barriers and respirators used alone or in combination to protect mucous membranes, airways, skin, and clothing from contact with infectious agents. The most common occupational risk the healthcare personnel face is due to contact with blood and body fluids during routine works like cleaning, instrument processing and patient care. Therefore, before undertaking any procedure the health workers should assess the risk of exposure to blood or body fluids. Based on the suspected risk using appropriate personal protective equipment's is important to break the chain of infection in health care setting.

All personal protective equipment's should be:

- Available close to the point of use and readily accessible
- Stored in a clean / dry area to prevent contamination until required for use
- Preferably single use if reusable there must be a clear policy and SOP for placement in bins after use and removal for laundering and recycling.
- Have an SOP for stock ordering and rotation to ensure there is always an adequate supply based on usage and that older items are always used first. Do not wait for stocks to run out before ordering more.

Types, uses, effectiveness and limitation of personal protective equipment's

Personal protective equipments are equipment used to prevent or minimize exposure to biological, chemical, physical and mechanical hazards. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits.

Common types of personal protective equipment's and area of protection

Table 1.1. Lists of personal protective equipment's and area of protection

Types of personal protective equipment's	**Area of protection**
Head Covering/Caps	Hair and Scalp
Goggle	Eyes
Face Masks	Nose, Mouth and Lower Jaw
Face Shield	Face
Gloves	Hand
Gowns	Upper body, skin and cloth
Apron	Front of the body
Boots	Lower legs and feet
Shoe cover	Shoe

Head Covering/Caps:

Head covers are most commonly used in surgical and procedure areas. Head covers or caps should be large enough to cover the entire scalp and hair. Facial hair is also required to be covered for surgical procedures in sterile areas. Once used it should be disposed or laundered if it is reusable.

Figure 1.4. Surgical head cover

2.1.2. Protective eye wear

Eye wear includes: goggles, safety glass, masks attached shield and face shield. Eye wear protects the staff during accidental splash of blood or other body fluid by covering the eyes. If the eye wear is reusable, it should be decontaminated in accordance with the manufacturer's guidelines. Hands should always be decontaminated after removing the equipment. Remember Personal eye glasses and contact lenses are not considered adequate eye protection.

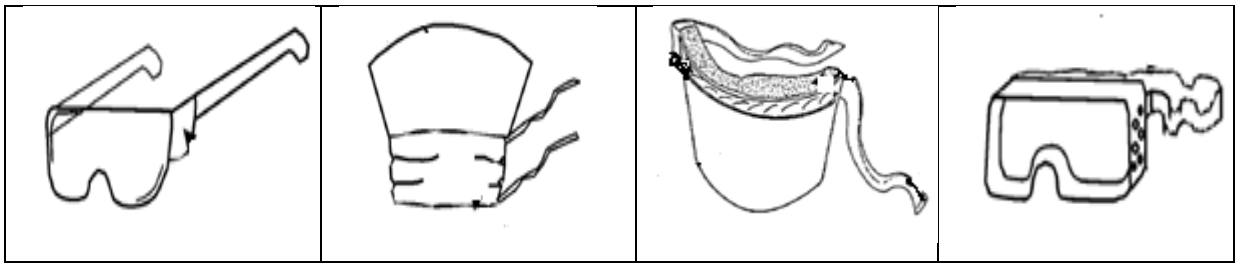


Figure 1.5. Protective eye wear

Masks

Masks used to cover the mouth and nose. Masks made from cotton or paper is comfortable but is not fluid-resistant and is not an effective filter to prevent inhalation of microorganisms transmitted via droplet nuclei (≤ 5 μm). Masks made from synthetic materials provide protection from large droplets (>5 μm) spread by coughs or sneezes. The use of masks during patient care is part of Standard Precautions when there is a potential for splashes or droplet transmission and is part of droplet precautions.

Types of Masks

There are two types of masks:

A. Surgical masks:

Surgical mask can prevent accidental splashes of blood or other contaminated body fluids on the health workers' nose or mouth. This preventive function, however, would not be effective unless the masks are made of fluid-resistant materials and it is not large enough to cover the nose, the lower part of the face, the jaw and all of the facial hair.

When removing the mask, one should handle the masks by the strings, do it with great care as the center of the mask is the most contaminated site of all other parts.

Figure 1.6 **A. Surgical masks**

B. Respirators:

Masks such as: N95, N-99 and N-100named as particulate respirators. This type of masks are worn by healthcare personnel for protection against inhalation exposure to airborne infectious agents that are <5μm. These include infectious droplet nuclei from patients with Mycobacterium tuberculosis, Variola virus (smallpox), SARS-CoV, and dust particles containing infectious particles such as spores of environmental fungi (e.g. Aspergillus sp.).

Figure 1.6 B. Respirators

Gowns:

There are three types of protective gowns used in health care facilities: isolation gowns, surgical gowns, and coverall suits.

Plastic Apron: Aprons keep contaminated fluids off the healthcare worker's clothing's and skin. For example, during invasive procedures, wearing a water resistant apron (disposable or reusable) will not only help to guard the healthcare providers against exposure to blood or body fluids.

Glove:

Healthcare workers wear gloves for the Following reasons:

- To reduce the risk of acquiring infections to the staff from patients
- To reduce the risk of transmitting microorganisms including skin flora from provider (health worker) to clients.
- To reduce cross contamination comes from contaminated hands of the health worker which are transmissible from one patient to another.

Types of gloves:

A. Surgical glove - should be used when performing invasive medical or surgical procedures.

B. Clean examination gloves–provide protection to healthcare workers when performing many of their routine duties. These gloves can be used whenever contact with mucous membrane and non-intact skin is anticipated (e.g. during medical examinations and procedures such as pelvic examination).

C. Utility (heavy-duty) gloves - should be worn when processing instruments, equipment and other items, for handling and disposing contaminated waste, and when cleaning contaminated surfaces.

When to use double gloves

Surgical and examination gloves have the leak rate of 4%. Therefore doubling gloves are important. Health care providers should double glove when:

- The procedure involves coming in contact with large amounts of blood or other body fluids.
- Performing orthopedic procedures in which sharp bone fragments, wire sutures and other sharp edged materials are likely to be encountered.
- Performing surgical procedures lasting more than 30 minutes.

When double gloving, the first glove should be a half size larger than normally worn gloves. The second pair, however, should be the correct size as this will help prevent the hand from cramping.

Key messages for gloves use

To reduce the risk of transmission of infectious disease, gloves should be properly used as follows:

• Hand hygiene with soap and water or hand sanitizer before putting on and taking off gloves.

• Follow the correct steps for taking on and off.

• Remove gloves and perform hand hygiene after completing examination of the patient or procedure that required gloves.

• Change to a new pair gloves if the gloves integrity becomes compromised (e.g. punctured).

• Hand hygiene should be performed between removing the compromised gloves and donning a new pair.

• Avoid unnecessary and inappropriate use of gloves

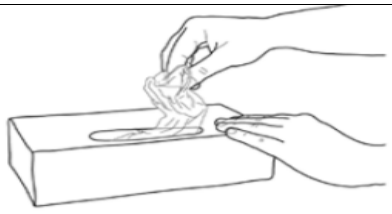
• Reuse of gloves is not recommended.

How to wear and remove gloves

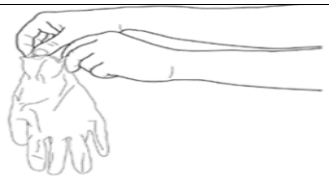
Procedure for wearing sterile gloves:

- Perform hand hygiene before an aseptic procedure'' by surgical hand scrub.
- Check the package for intactness. Open the first non-sterile packaging by peeling it completely off the heat seal (cover) to expose the second sterile wrapper, but without touching it.
- Place the second sterile package on a clean and dry surface without touching the surface. Open the package and fold it towards the bottom so as to unfold the paper and keep it open.
- Using the thumb and index finger of one hand, carefully grasp the folded cuff edge of the glove.
- Slip the other hand into the glove in a single movement, keeping the folded cuff at the wrist level.
- Pick up the second glove by sliding the fingers of the gloved hand underneath the cuff of the glove (includes step7).
- In a single movement, slip the second glove on to the ungloved hand while avoiding any contact/resting of the gloved hand on surface other than the glove to be donned (contact/resting constitutes a lack of asepsis and requires a change of glove) (also includes step 9 and 10).
- If necessary, after donning both gloves, adjust the fingers and inter-digital spaces until the gloves fit comfortably.
- Unfold the cuff of the first gloved hand by gently slipping the fingers of the other hand inside the fold, making sure that any contact with the outer surface of the glove is avoided (lack of asepsis requiring a change of gloves) (includes step13).

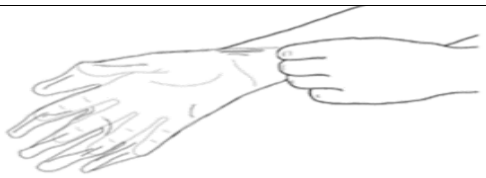
- The hands are gloved and must touch exclusively sterile devices or the previously - disinfected patient's body area.
- Remove the first glove by peeling it back with the fingers of the opposite hand. Remove the glove by rolling it inside out to the second finger joint (do not remove completely) (includes step 16 and 17).
- Remove the other glove by turning its outer edge on the fingers of the partially un-gloved hand.
- Remove the glove by turning it inside out entirely (ball forming) to ensure that the skin of the health-care worker is always and exclusively in contact with the inner surface of the glove.
- Discard gloves.
- Perform hand hygiene after glove removal according to the recommended indication.



1. Take out a glove from the box, taking care to pull it out of the box by the edge of the cuff



2. Continue to hold the glove by the top edge of the cuff only as you slip your fingers into it. Do not touch the fingers or other areas of the glove's surface.



3. Finish donning the first glove by gently pulling it on, holding it by the top edge of the cuff.

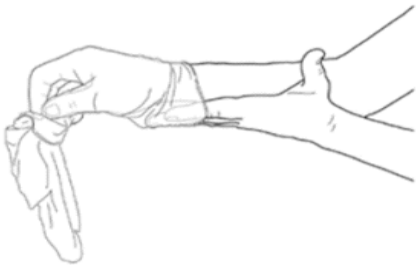
4. Using your bare hand, take a second glove from the box, taking care to lift it out of the box by the edge of the cuff

5. Transfer the glove to your gloved hand by the edge of the cuff. Insert your bare fingers into the glove. To avoid touching the skin of the forearm while pulling the glove on, turn the external surface of the glove to be donned over slightly. Gently finish pulling the second glove up.

6. Once gloved, hands should not touch your face or other surfaces. Gloved hands should only take care of patients or perform other healthcare related activities, like taking a nose or throat sample for testing.

Fig 1.7. How to wear sterile gloves

1. Pinch one glove at the wrist level to remove it, without touching the skin of the forearm. Peel the glove downward and away from hand, allowing the glove to turn inside out



2. Hold the removed glove on the gloved hand. Slide the fingers of the ungloved hand inside between the glove and the wrist. Remove the second glove by rolling it down the hand and over top of the first glove.

3. Discard the removed gloves in an appropriate waste container

4. **Clean your hands with soap and water or alcohol-based hand sanitizer.**

Figure 1.8. How to remove (doff) sterile gloves

Donning surgical sterile gloves at the time of a surgical intervention follows the same sequences except that:

- It is preceded by a surgical hand preparation.
- Donning of the gloves is performed after putting on the sterile surgical gown.
- The opening of the first packaging (non-sterile) is done by an assistant.
- The second packaging (sterile) is placed on a sterile surface and then used for the intervention.
- Gloves should cover the wrists of the sterile gown.

Self-check: questions 1.5.1

1.List common a type of personal protective equipment's used when giving the health service in health institute and at community level? Which part of the body they protect.

Wear the sterile gloves based on the wearing procedures mentioned above, and remove the used glove as per the procedures.

Respiratory Hygiene and Cough Etiquette:

Respiratory hygiene is designed to minimize the risk of transmission of respiratory infections. It is used when for having cough, fever, congestion, rhinorrhea (runny nose).

The Focus area of education of respiratory hygiene/cough etiquette include: -

- Cover the nose and mouth with a disposable tissue when sneezing or coughing. if disposable tissue is not available sneeze into bent elbow
- Discard wasted tissue immediately into a waste bucket. Do not put the tissue into a pocket
- Strictly follow hand hygiene practice after contact with respiratory secretions
- Face away from other people when coughing or sneezing
- Appropriate teaching materials such as posters should be used when educating patients
- Based on diseases condition apply Transmission Based Precautions

- Use surgical masks on the coughing person, when important appropriate. Maintain ideal distance at least 1 meter between persons with respiratory infections in common waiting areas.

Figure 1.9. Sneezing into bent elbow

Injection Safety and Sharp Injury Prevention

In healthcare settings, injuries from needles or other sharps are the number-one cause of occupational exposure to blood-borne infections. Injection safety baseline studies conducted by MOH and MMIS in 2004 and 2005 showed about 74% of injections were unsafe, about 72% of health facilities practiced unsafe disposal and the prevalence rate of needle stick injury was 30 to 35%. It is also reported that almost half (45%) of the community members have a tendency of preferring injections to other preparations

Injection Safety

A safe injection the practice of injection that does not harm the recipient, does not expose the HCW to any avoidable risks, provided by skilled person, using appropriate injection equipment and does not result in waste that is dangerous for the community.

Unsafe injection is a practice of injection that could harm the recipient, and health workers and may result infection.

Risks and impacts associated with unsafe injection practices

Unsafe injection practices can affect health care workers, patients and general community at risk of infection.

Risk to Patients

Patients who are served with unsafe injection practices exposed to different risks which include:

Transmission of blood born infections - infectious agents inoculated into the patient's body through unsafe injection. There are about 40 blood borne pathogens that could be transmitted via injection. The commonest diseases occurred due to unsafe injection are: HBV, HCV, HIV/AIDS are and with grave implications.

Injection abscesses- these are inflammatory conditions ranges from the initial signs of inflammation to big swellings occurring from supportive processes.

Paralysis- if nerves are injured by unsafe injection practice paralysis and trauma is resulted.

Drug/allergic reactions shock - unsafe injection may lead patients to a life threatening condition characterized by sudden collapse of the circulatory system due to immunological response to the injected drug, or other local or systemic allergic reactions.

Risk to health care workers:

Unsafe injection practices can put health care workers at risk of Hepatitis C (HCV); Hepatitis B (HBV); HIV and other blood borne pathogens. HCWs are at an increased risk from blood borne pathogens because they handle sharps, including needles and syringes. It is estimated that 39% of HCV, 37% of HBV, and 4.4% of HIV infection among worldwide are attributable to occupational exposure to sharps injuries.

Best Practices in Injection Safety

Avoid unnecessary injections- injections should only be used when there is life threatening conditions, mal-absorption syndromes and inability to swallow drugs.

Therefore, prescribers and service providers should:

- Give injections only when necessary
- Encourage patients to accept oral medications when possible
- Explain the risks associated with injections to patients
- Educate patients about the need to take oral drugs as prescribed and review these instructions with them.
- Inform patients the potential side effects of medications that is being prescribed

Prevent access to used needles and syringes

- Seal sharp containers for transport to a secure area in preparation for disposal. After closing and sealing sharps containers, never open, empty or reuse them.
- Manage/dispose sharps waste in an efficient, safe and environment-friendly way to protect people from voluntary or accidental exposure to used injection equipment.
- Disposal of used syringes, needles and sharp containers.
- The following guiding principles should be used for disposal of syringes, needles, and sharps containers.
- Dispose all sharps in a safety box immediately after injection.
- If the syringe is a retractable one, make sure to engage the retraction feature before disposing of the syringe.
- Collect used syringes and needles at the point of use in an enclosed sharps container (safety box) that is puncture and leak-proof.
- Do not use boxes that are open, overflowing or punctured. Get a new one instead dispose safety boxes when 2/3 full.
- Dispose of the sharps and sharp containers by burning, burying or encapsulation.
- Always put on a heavy duty gloves when handling sharps containers.
- Safe handling of vials containing medication

Sharps Safety

Sharps are any sharp instrument or object used in the delivery of healthcare services including hypodermic needles, suture needles, scalpel blades, sharp instruments, IV catheters, and razor blades. Safety or sharps box is a puncture and leak-resistant container for disposal of sharps.

Proper management of safety box:

- Can be free-standing or fixed.
- Easily accessible to health worker for easy disposal of needles
- Should not be easily accessible for public
- Dispose when 3/4 full
- Use 1 per defined area of need

Sharps containers-dos and don'ts:

- Do put sharps containers as close to the point of use as possible, ideally within arm's reach.
- Do attach containers to walls or other surfaces if at all possible.
- Do mark them clearly so that people will not unknowingly use them as for discarding other items.
- Do place them at a convenient height so staff can use and replace them easily.
- Do mark the fill line at the three quarters full level.
- Don't shake a container to settle its contents and make room for more sharps.
- Don't place containers in high traffic areas where people could bump into them or be stuck by someone carrying sharps to be disposed of.
- Don't place containers on the floor or anywhere they could be knocked over or easily reached by a child.
- Don't place containers near light switches, overhead fans or thermostat controls where people might accidentally put their hand into them.
- Do not put the following items on the sharp box: latex gloves, IV bags or extension tubes, dressing materials (like adhesive tape and gauze), compresses, cotton pads, empty vials and ampoule broken thermometers

Safe disposal of used needles and syringes

- Use of best practices can help to prevent sharps injuries to HCWs. Other Sharps Safety Dos and Don'ts
- Do wear gloves when using needles
- Do discard needles with syringes and other sharps immediately after use
- Do discard needles and other sharps in sharps container
- Do not walk around with needles and other sharps
- Do use receivers to pass sharps to others and alert them before passing the sharps
- Do not remove break, bend manipulate, or manually remove needles before disposal.
- Do not recap needles after use but if a needle must be recapped, use a single-handed scoop technique.
- Do not leave sharps lying around the facility
- Do not point needles and other sharps at yourself or others

Self check questions 1.5.1.

Unsafe injection exposes the patients and health care workers to risk of infection.

A. Describe the risks posed to patients?
B. Describe the risks posed to Health care workers

Sterilize instruments and devices

In all healthcare settings, reusable medical devices should be handled in a manner that minimizes the risk of service user, health care worker and environmental contact with potentially infectious material. Healthcare workers are increasingly at risk of becoming infected with serious blood borne viruses such as HBV, HCV and HIV.

Processing Medical Devices

Any medical device (instruments and equipment) that is to be reused requires reprocessing: **Cleaning**: A process that physically removes contamination but does not necessarily destroy

microorganisms. Cleaning removes germs and the organic material on which they thrive. Cleaning is a pre-requisite for equipment decontamination to ensure effective disinfection.

Disinfection: A process that reduces the number of viable microorganisms to a level that they are unlikely to be a danger to health but which may not necessarily inactivate some agents such as certain viruses and bacteria spores. Disinfection is carried out using either thermal (moist or dry heat) or chemical means. Items must be cleaned before being disinfected.

Sterilization: a process that destroys all microorganisms on the surface of an instrument or device, to prevent transmission of infection associated with the use of that item

Table 1.2: Categories of items for service user care

Risk category	Level of disinfection/sterilization	Examples
Critical	Sterilization	Reusable surgical instruments
Semi-Critical	High-level disinfection	Respiratory instruments, specula used for vaginal examination ,endoscopes
Non-Critical	Cleaning	Blood pressure cuffs, stethoscopes

According to the WHO soaking of instruments in 0.5% chlorine solution or any other disinfectant prior to cleaning is not recommended for the following reasons:

It may damage/corrode the instruments, especially those made from metals

The disinfectant may be inactivated by blood and body fluids, which could become a source of microbial contamination.

Transportation of contaminated items soaked in chemical disinfectant to the cleaning and disinfection area may pose a risk to health care workers may contribute to the development of antimicrobial resistance to disinfectants.

5.2. Commonly Used Chemical Disinfectants

List and properties of commonly used chemical disinfectants in healthcare settings are:

- Alcohols
- Chlorine and chlorine releasing compounds: including sodium hypochlorite (Chlorine bleach) , calcium hypochlorite or chlorinated lime and sodium dichloroisocyanurate
- Glutaraldehyde
- Iodine and Iodophor solutions
- Hydrogen Peroxide

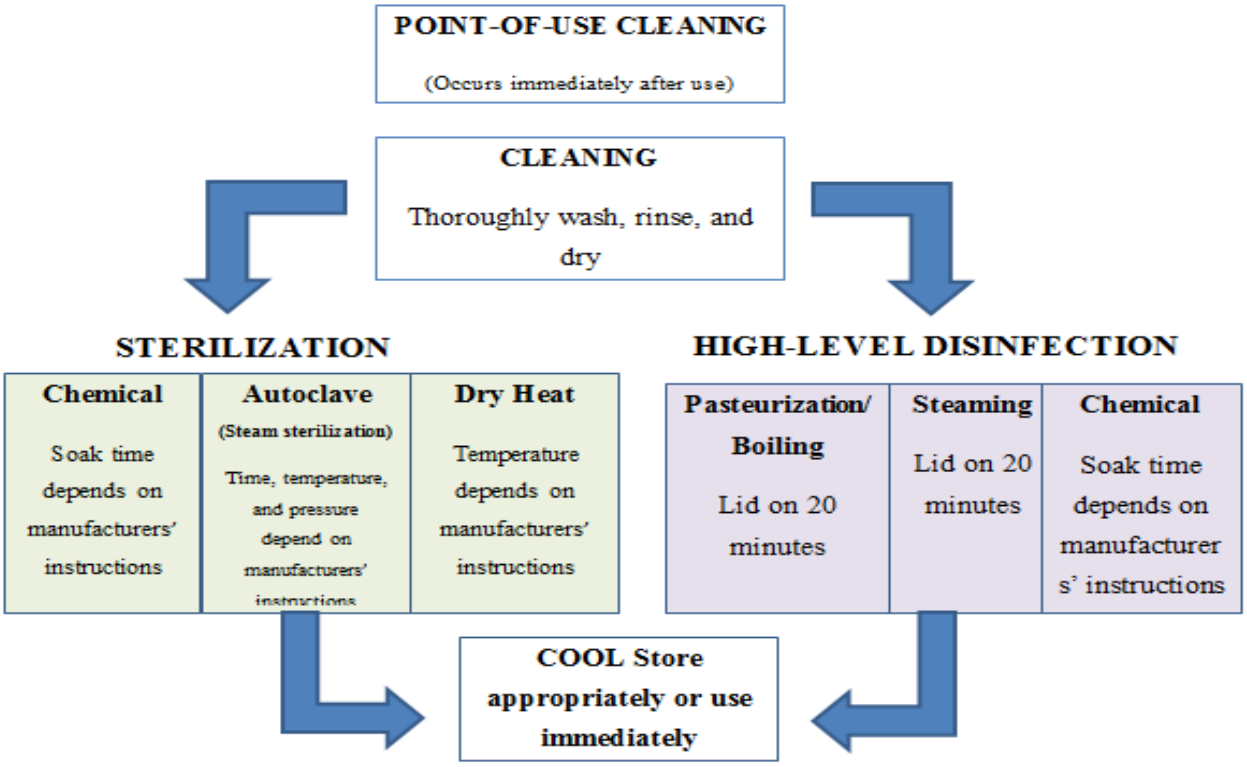


Figure 1.9.Work flow for instrument processing and other medical devices

5.3. Steps in Processing Items

Cleaning:

Cleaning is a critical step in instrument processing because:

- Cleaning is the first step in reprocessing a device after use
- It reduces damage to instruments.
- It makes instruments easier to process.
- Bio-burden and residual cleaning agents remaining on an item can inactivate chemical disinfectants which can result in disinfection and sterilization failures.
- Hinged instruments may have remnants of blood and tissue from the operation. The tubing of hollow instruments may be also full of these soiled materials.
- Therefore, it is important to follow all the necessary steps to properly clean instruments prior to high-level disinfection or sterilization.
- Before transport to the instrument processing area, health care workers should perform point-of-use cleaning - wiping instruments to remove tissue and blood immediately at the conclusion of the procedure.
- Once instruments are in the instrument processing area, cleaning involves thorough cleaning of them with water and a detergent and/or an enzymatic cleaner followed by thorough rinsing, and then drying before further processing.
- It is an essential pre-requisite to ensure effective disinfection or sterilization by reducing the number of microorganisms, especially endospores causing tetanus usually found on soiled instruments and equipment.
- Neither sterilization nor high level disinfection could be effective without prior cleaning.
- Failure to properly clean an instrument may allow foreign material located outside and inside of the device to hinder disinfection and/or sterilization.
- Cleaning is accomplished by using a manual process with cleaning chemicals (detergent) and water, brushing or flushing and thoroughly cleaned prior to disinfection or sterilization, irrespective of available resources.
- One can clean without sterilizing, but one cannot sterilize without cleaning!

Steps of manual cleaning:

- Put on Personal Protective Equipment (PPE) including a water resistant gown, gloves, face mask and head cover. Care should be taken even when wearing heavy-duty utility gloves, to prevent needle sticks or cuts when washing sharps.
- Fill sink or appropriate basin with sufficient warm water for complete immersion of the devices being cleaned
- Add the appropriate quantity of detergent following the manufacturer's instructions for dosage.
- Clean the device under the surface of the water so that aerosols are not produced.
- All devices be disassembled so that all surfaces may be cleaned and disinfected, irrespective of the cleaning method chose.
- Use appropriate brushes to properly clean box locks, lumens and other hard-to-clean areas
- In another sink or basin, completely immerse the device in clean purified water and rinse the device thoroughly.
- Air-dry or hand-dry using a disposable clean, non-linting cloth.
- Items that cannot be cleaned thoroughly should not be reused, but be discarded after use.

Table 1.3: Effectiveness of methods of processing instruments

METHOD	EFFECTIVENESS (kill or remove microorganisms)	END POINT
Cleaning(soap and rinsing with water)	Up to 80%	Until visibly clean
High-Level Disinfection	95%(does not inactivate Endo-spores)	Boiling or chemical For20minutes
Sterilization	100%	High-pressure steam, dry heat or chemical for the

High-Level Disinfection:

High level disinfection is required for instruments that cannot be sterilized in an autoclave or using chemical sterilization methods. Types of high level disinfection are:

Boiling: is a process of disinfecting materials by allowing it for 100 C (212 F) for 20 minutes. This method is the common practice for HLD of instruments and equipment used for semi-critical and sometimes critical procedures as it was the only available option in some low-income countries.

Steaming: is a process of disinfecting instruments and equipments in autoclave by allowing them to steams for 20 minutes.

Chemicals: Ortho- phthalaldehyde (OPA), Glutaraldehydes, Formaldehyde and Peroxide.-are the chemical disinfectants used as high- level disinfectants routinely. These chemicals can achieve high-level disinfection if the items being disinfected are thoroughly cleaned before immersion.

Sterilization: Sterilization is a process in which the destruction of all micro-organisms including bacterial endospores takes place. This can be achieved by either physical or chemical methods and is necessary especially for medical devices penetrating sterile body sites or having direct contact with the blood. Sterilization in health facilities can be achieved by high pressure steam (autoclaves), dry heat (oven), chemical sterilants (Glutaraldehyde or formaldehyde solutions) or physical agents (radiation)

Self check questions 1.5.1

Instruments and equipments used in health care service are categorized as, critical, semi critical and non-critical based on potential of risk. Identify types of instruments and equipments in each category and describe which reprocessing activity fits for them. Justify why you use it?

Safe handling of linen and laundry

Every facility should have a policy on how to manage linen that includes collection, transport and storage of linen on-site. In addition facilities should have a policy for how to manage service users' personal laundry.

Handling used or infectious linen:

- Used linen should be handled carefully, to avoid dispersing skin scales into the environment or onto staff clothing.
- Appropriate PPE should be used when handling used linen
- Infectious linen must be placed directly into an alginate stitched bag or water soluble bag at the location of use for example in the service users room/at the bedside.
- Color coded laundry bags may be used
- Used linen such as sheets must be laundered using a validated temperature disinfection stage, either within an industrial laundry facility or using a temperature validated semi-industrial washing machine.
- Hand hygiene should be performed after handling used linen
- Used linen must not be rinsed or sorted in service user care areas or washed in domestic washing machines
- Infectious linen or clothing should never be manually rinsed as this may cause splashing and contaminate the workers and environment. This includes
- Not soaking infectious linen in basins of water.

Storage of Linen:

- Clean linen should be stored in a designated cupboard or room that is only used for the purpose of storing linen.
- Do not store clean linen beside used linen.
- If using linen trolleys in a care facility ensure the trolley is maintained and cleaned regularly.
- Clean linen should be kept in its plastic wrapping until it is brought to point of use.

Table 1.4: Recommended bag color for storing linens in health care setting

Types of color bags	Name of color	Lines to be stored
	Red bags	For linen from patients with infectious conditions (e.g., Ebola. Lassa fever). Place linen in a strong impervious plastic bag to avoid leakage, label indicating point of origin
	Yellow bags	For used linen. (e.g., visibly soiled with blood or body fluids)
	Black bags	For used linen (e.g., not visibly soiled) from general patient-care wards and departments
	White bags	For clean linen from the laundry
	Green bags	For used (visibly and non-visibly soiled) linen from special departments such as the operating theatre and the labour and delivery wards

Cleaning and Disinfecting Environmental Surface

Cleaning is a process of physically removing infectious agents and physical maters on equipments. Cleaning does not necessarily destroy infectious agents, but it is important to remove dried physical material which can hide microorganisms and affect the effectiveness of disinfection.

Cleaning is an essential precondition to ensure effective disinfection or sterilization. Without good cleaning process neither sterilization nor HLD could be effective. During cleaning process using soap is important because water alone will not remove protein, oils or grease.

Methods of Cleaning

Dry Methods –includes dust attractant mop, dry dusting and sweeping brushes. Dusting and sweeping brushes are not recommended as it may disperse dust and micro-organisms.

Wet Methods – includes scrubbing, mopping and damp dusting

General Principles for Cleaning

- Scrubbing (frictional cleaning) is the best way to physically remove dirt, debris and microorganisms.
- Cleaning is required prior to any disinfection process because dirt, debris and other materials can decrease the effectiveness of many chemical disinfectants.
- Cleaning products should be selected on the basis of their use, efficacy, safety and cost.
- Start cleaning from the least soiled areas to the most soiled areas and from high to low areas so that the dirtiest areas and debris falling on the floor will be cleaned up last.
- Dry sweeping, mopping and dusting should be avoided to prevent dust, debris and microorganisms from getting into the air and landing on clean surfaces.
- Too much or too little water may reduce the effectiveness of disinfectants. Follow instructions for mixing (dilution) when using disinfectants.
- Cleaning methods and written cleaning schedules should be based on the type of the surface, the amount and the extent of the soil present and the purpose of the area.
- Routine cleaning is necessary to maintain the standard of cleanliness.
- Post schedules and procedures of cleaning

Personal protective equipments for housekeeping

Using personal protective equipment such as gloves preferably the utility or heavy duty gloves, protective shoes, plastic or rubber apron, masks, protective eye wears etc are important when performing housekeeping activities.

When to use Personal protective equipments:

- Handling disinfectant cleaning solutions
- Cleaning patient care areas
- Cleaning heavily contaminated areas
- Handling soiled linens
- Handling soiled items and instruments

- Handling or disposing of wastes
- When spills or splashes are expected

How to Prepare a Disinfectant Cleaning Solution

Chlorine-containing solutions (sodium hypochlorite) are excellent and inexpensive disinfectants.

Formula for making a dilute solution from a concentrated solution

- Check concentration (% concentrate) of the chlorine solution.
- Determine total parts of water using the formula below.

Equation 1

$$\text{\% concentrate} = \frac{\text{of chlorine in bleach}}{\text{\% chlorine desired}} - 1$$

Mix 1part concentrated bleach with the total parts water required

Example: Make a dilute solution (0.5%) from 5% concentrated solution

STEP 1: Calculate Parts of water (TP) water

$$\text{Total parts (TP) of water} = \frac{5\%}{0.5\ \%} - 1 = 9$$

STEP 2: Take 1 part concentrated solution and add to 9 parts water. Now you get 0.5% chlorine solution for disinfection

Formula for making a dilute solution from a dry powder:

- Check concentration (% concentrate) of the powder you are using.
- Determine amount of chlorine (gm.) to be add in a liter of water using the formula below.

Equation 2

$$\text{Gram/liter (Gm/lit} = \frac{\%\ \text{dilute}}{\%\ \text{concentrate}} * 1000$$

- Mix the calculated amount of dry powdered with one liter of water.

Example: Make a dilute chlorine solution (0.5%) from a concentrated powder (35%)

STEP 1: Calculate grams/liter:

$$\text{Gram/liter (Gm/lit} = \frac{0.5\%\ \text{dilute}}{35\%} * 1000 = 14.2\ \text{gm/lit}$$

STEP 2: Add 14.2 grams to 1 liter of water. Now you get 0.5% of chlorine solution for disinfection.

How to clean spills of blood and other body fluids by using chlorine solution:

Clean spills of blood, body fluids and other potentially infectious fluids immediately at work place. Consider the following points while cleaning the spills:

- **For small spills**: Remove visible material by using a cloth soaked in a 0.5% Chlorine solution, then wipe clean with a disinfectant cleaning solution. While cleaning do not forget wearing of utility or examination gloves.
- **For large spills**: Flood the area with a 0.5% Chlorine solution leave for 10 minutes and mop up the solution and then clean as usual with detergent and water. While cleaning do not forget wearing of utility or examination gloves.

How to clean soiled and contaminated cleaning equipment:

- Decontaminate cleaning equipment that has been contaminated with blood or body fluids by soaking it for 10 minutes in a 0.5% Chlorine solution or other locally approved and available disinfectants.

- Wash cleaning buckets, cloths, brushes, mops and the like with detergent and water daily or right away if visibly dirty.
- Rinse them in clean water.
- Dry them completely before reuse

Self Check questions 1.5.1

1.Which one is true about handling of used linen?

A. Using PPE is not mandatory while handling used linens
B. Used linen must not be sorted in beside clean linens
C. Use red colored laundry bag for non infectious linens
D. Used linen can be rinsed

2.You have given 70% powder chlorine hypochlorite to disinfect the delivery room in the health post in your locality. Calculate the chlorine powder in gm/liter which is used to form 0.5% chlorine solution for disinfection in your health post.

Healthcare Waste Management

Health-care waste is any wastes whether solid or liquid which are generated from day to day activities in health care setting. It includes all the waste generated by healthcare establishments, research facilities and laboratories. Health care waste management is a complex process which incorporated waste generation, collection, transport, storage, and disposal and involving clinical and non-clinical staff across a facility, and often depends on outside agencies.

Risks Related to Healthcare Waste

Anyone who comes into contact with waste, both in the community and within the facility (HCWs, patients, visitors, laundry workers, cleaners, etc.) may be at risk.

Risks from health care waste include:

- Exposure to pathogenic organisms, harmful chemicals, toxins, or radioactive substances
- Injury from sharp items.

Categories of healthcare wastes:

Categorizing the waste produced in health care facilities is useful to determine how to handle and dispose health care wastes. 75–90% of health care wastes are the ***general waste*** but 10-25% of health care wastes are considered ***hazardous wastes*** which can expose patients and health workers to infection and injuries.

Infectious waste from health care facilities must be handled and disposed of properly because they may carry microorganisms that have the potential to infect individuals who come in contact with them.

*You will learn details in grade 12 waste management module.

1.5.2. Transmission Based Precautions (TBP) As Prevention Methods

Transmission Based Precautions is a set of measures we can put in place to reduce the risk of infection spread when an infection is either suspected or confirmed. The aim of transmission based precautions is to reduce the opportunities for that infection to spread by breaking the chain of infection at the route of transmission**.**

Application of Transmission Based Precautions:

When a service user has a known or suspected infection there are 3 transmission routes to be concerned about, these are: contact, droplet and airborne.

A. **Contact Precautions**:

Contact transmission can be direct (e.g. blood from an infected person comes in contact with a mucous membrane or break in the skin of another person) or indirect (e.g. via shared equipment that has not been cleaned sufficiently, e.g. commodes).Contact precautions should be implemented when there is a risk of direct or indirect transmission of infectious microorganisms that are not effectively contained with Standard Precautions alone. Examples of this are highly infectious skin infections.

There are 5 main contact precautions that should be applied in addition to standard precautions:

- Hand hygiene
- Use of appropriate Personal protective equipments
- Special handling of equipment (including environment, waste and linen management)
- Service user placement
- Minimizing service user movements between service user care areas.

B. Droplet Precautions:

Some infectious microorganisms can be transmitted through the respiratory route, generated through coughing, sneezing or talking. The transmission might be directly from infected person susceptible host, while he/she is coughing/sneezing and indirectly (touching a surface where a person has coughed onto, then transferring the microorganism to your eyes/nose/ mouth via your contaminated hands).Some common 'droplet' microorganisms experienced in community health and social care include influenza, meningitis, mumps, and rubella viruses SARS-CoV-2, COVID-19 etc.

Applying droplet precautions is similar to contact and it also respiratory hygiene and cough etiquette. Avoiding poor ventilation and ensuring adequate distance, ideal greater than 3 meter is recommended.

C. Airborne Precautions:

Airborne precautions prevent transmission of microorganisms that remain infectious over time and distance when suspended in the air. These microorganisms may be inhaled by susceptible individuals who have not had face to face contact with the infectious individual.

Microorganisms' associated with airborne precautions include measles, chicken pox and tuberculosis.

How to apply Airborne Precautions:

The key aspects of applying airborne precautions relate to:

- Standard precautions, including cough/respiratory hygiene

- Appropriate ventilation
- Use of appropriate **Personal protective equipments**, particularly correctly fitted respirators
- Minimizing exposure of people who use healthcare services and healthcare workers to the infectious microorganism
- PPE should be available in a range of sizes to ensure the wearer has appropriately fitting should be easily accessible using dispensing units and should be located outside the room/bay of the service user.
- If staff are unfamiliar with Personal protective equipments donning and doffing, giving orientation is important to ensure the donning and doffing of Personal protective equipments is correct.
- All Personal protective equipments with the exception of a mask can be removed inside the service user's room. Masks should be removed outside the service user's room.
- Health care workers that provide care in the home of a service user should have access to a full range of Personal protective equipments.

When we apply transmission based precautions remember to fully communicate the reason why you are doing this to the service user, care giver and other staff to reduce anxiety and fear and encourage compliance with measures

Self-check questions1.5.2

1. What are the three routes of infection requires transmission based precaution?
2. Based on the above question give at least two conditions and diseases expected to transmit through this transmission routes.

Unit Summary

Infection prevention is a practical, evidence- based approach preventing patient and health care workers from being harmed by avoidable infection.

Elements of the chain infection are: infectious agent, reservoir, portal of exit, mode of transmission, portal of entry and susceptible host

Source of the infection is an object one in which the agent of infection lives and propagates. It can be human being or animal from which the infectious agent is secreted into the environment and from there to individuals.

Standard precautions are the basic set of infection prevention and control strategies which are implemented in health facilities in all times.

Transmission-based Precautions are set of infection prevention and control intervention for certain infectious diseases which are considered as highly transmissible.

Hand hygiene is the single most important infection prevention and control .It includes; hand washing, hand antisepsis, antiseptic hand rub and surgical hand antisepsis.

Personal protective equipment or Personal protective equipments is equipment used to prevent or minimize exposure to hazards such as: biological, chemical, physical (radiological, electrical) and mechanical hazards

A safe injection is the practice of injection that does not harm the recipient, does not expose the health care worker to any avoidable risks

Reusable medical devices should be handled in a manner that minimizes the risk of service user, health care worker and environmental contact with potentially infectious material.

Cleaning is a process of physically removing infectious agents and other organic matters on which they live and thrive

Infectious waste from health care facilities must be handled and disposed of properly because they may carry microorganisms that have the potential to infect individuals who come in contact with them.

Unit Review Questions

You can assess yourself how well you have achieved the stated learning outcomes in this unit by answering the questions below. Write your answers in you note book and discuss with your peers and check your answers with the notes on the self-assessment questions at the end of this module.

1. Which one of the following statement indicates direct mode of infectious diseases transmission?

    A. HIV/AIDs transmitted by unsafe sexual intercourse
    B. Malaria transmitted by anopheles mosquito
    C. Cholera transmitted by contaminated water
    D. Typhus transmitted by the bite of louse

2. Which type of glove is used when processing the used instruments and equipment in health care setting?

    A. Clean examination gloves
    B. Utility(heavy-duty gloves
    C. Surgical glove
    D. None of the above

3. Which one of the following is not true about work place cleaning principle?

    A. When formulating dilution of disinfectant following the manufacturer instruction is important issue
    B. Start Cleaning from the least soiled areas to the most soiled areas
    C. Efficacy is one of the requirement for selection of cleaning materials
    D. Disinfection is prior process activity than cleaning

4. List at least five critical situations which require frequent hand washing practices.
5. What conditions force you to wear double glove when giving health care service to clients?
6. How can we prevent health care workers from needle stick injury?

UNIT 2

Controlling Risk and Hazards

2.1. Introduction

Anticipation, recognition, evaluation and control of those hazards and risks exposing to hazard which are arising in or from the work place is important, because, they may cause sickness, impaired health and well-being, or significant discomfort among workers or among the citizens of the community.

Learning outcomes :

After the accomplishing this unit the students will be able to:

- Describe overview of occupational health and safety
- Identify risk assessment
- Describe safety management system

Key terms: risk, hazard, safety

2.2. Over view of occupational health and safety (OHS)

Occupational health is deals with all aspects of work-related health and safety and has a strong focus on prevention, especially for infectious (such as disease exposures) and non-infectious risks (such as injury).Occupational exposures to sharps injuries are an example of the substantial impact of occupational infections among health care workers. It is estimated that 39% of hepatitis C virus (HCV), 37% of Hepatitis B virus (HBV), and 4.4% of HIV infections among health care workers worldwide are attributable to occupational exposure due to sharps injuries.

Hazard is a situation or item that could cause harm. Risk is the chance, high or low, that a hazard will cause harm, injury or ill health, or the likelihood, or possibility, which harm (injury, illness, death, damage etc) may occur from exposure to a hazard. Risks and hazards should be monitored so they are minimized, protecting the health and wellbeing of all workers and clients.

Hazard identification is the process of examining each work area and work task for the purpose of identifying all the hazards which are ―inherent in the job‖. Work areas include but are not limited to machine workshops, laboratories, and office areas, agricultural and horticultural environments, stores and transport, maintenance and grounds, reprographics, and lecture theatres and teaching spaces.

Risk assessment: Is defined as the process of assessing the risks associated with each of the hazards identified so the nature of the risk can be understood. This includes the nature of the harm that may result from the hazard, the severity of that harm and the likelihood of this occurring.

Risk control: Taking actions to eliminate health and safety risks so far as is reasonably practicable. Where risks cannot be eliminated, then implementation of control measures is required, to minimize risks as far as is reasonably practicable. A hierarchy of controls has been developed and is described below to assist in selection of the most appropriate risk control measure/s.

Monitoring and review: This involves ongoing monitoring of the hazards identified, risks assessed and risk control processes and reviewing them to make sure they are working effectively.

2.3. Risk assessment

Effective infection prevention & control is central to providing high quality healthcare for people who use health and social care services and a safe working environment for those that work in these environments. Everyone who are working in health care setting should be incorporated in risk assessment in his/ her daily practice. IPC Risk Assessment involves two key considerations, which includes:

- Understanding the way particular microorganisms are transmitted, and
- Using this knowledge to identify key infection preventation and control principles to prevent this transmission

Infection risks: are the state in which an individual is at risk to be invaded by opportunistic or Pathogenic agents such as; virus, bacteria, fungus, protozoa, parasites and other microorganisms from endogenous or exogenous sources.

Activities and tasks that put clients and/or other workers at risk

The most common activities and tasks that put the clients and workers at risk are: exposure to chemicals, risk of fire, repetitive use motion/injury, electrical hazard, accidental falls and falling of objects.

Exposure to chemicals: substance such as fumes, gases, liquids, solids, dust, vapors and corrosives can harm the health of health workers and clients. This type of substances induced to people at risk through ingesting the substance, inhaling and absorbing it through the skin.

Fire accident: People in health care setting can expose to fire accident. Therefore the health care institutes should have functional fire extinguishers fixed at appropriate place. All health workers and clients should have adequate information about how to use it and about emergency exit/escape routes.

Repetitive use injury: The parts of body that suffer from repetitive use are the back, shoulder, forearms, wrists and hands.

Injury due to electrical hazards: Workers who work directly with electricity and persons who work with electrical equipment in work place and clients are at risk injuries posed from electricity.

Accidental falls and falling objects: fall accident can occur at any place where people live. Fall accident night be caused from slippery floor; steps that are too high or too low**.** The fall accident might results causing broken bones, bruising etc.

Steps in risk assessment

Risk assessment has five basic steps, which incorporates: risk identification, risk analysis risk evaluation, risk treatment and monitoring and review.

Risk identification –is finding of things and situations that could potentially cause harm to people. The identification process incorporates identifying source and events of risk, their causes and consequences.

Risk analysis – a process that is used to gain a better understanding of the risk identified and the level of risk associated with it. Assessing the level of associated risk takes account of controls in place to mitigate the risk.

Risk evaluation – this is a process to determine if the level of risk is acceptable. If the risk is not acceptable it is essential to consider how to treat the risk. Therefore the purpose of risk evaluation is to assess the level of risk and making decision based on the finding of evaluation and to determine appropriate treatment.

Risk treatment is the process of selecting and implementing measures to modify the risk based on the result of evaluation.

Monitoring and Review: risk monitoring is assessing risks and making informed decisions about managing them. It involves regular reviewing of risks and their potential impact on the services, identify new treats and updating plans and strategies as needed. Therefore, you must monitor the effectiveness of your control measures implemented. You should also review them if, they may no longer be effective, there are changes in the work place that could lead to new risks.

Risk management-is a constant process within an organization. Health & Social Care services should constantly monitor and review their risks, and ensure they are actively putting controls in place to mitigate against these risks, in order to protect their service users, staff, and visitors and ensure continuity of service delivery.

Managing the risks raised in health care setting needs the collaboration of the health system, health service delivering organization, health care workers and individuals.

Basic principles in risk management: there are five basic principles implementing in risk management are:

- Avoid risks
- Identify risks
- Analyze risks
- Evaluate risk and
- Treat the risks

Practical example:

Case Study: Influenza in a Residential Care Setting

A cluster of cases of confirmed influenza occurred in a residential care facility, which were observed after a group activity involving dancing was held in the dining room prior to the midday meal.

It was observed that a resident who was unwell with nasal discharge and cough had attended the group activity and had sat at the dining tables. It was noted that during the meal the ill resident placed used tissues on the dining room table. It was also noticed that a number of service users remained in the vicinity of the dining room post activity as their rooms were a short distance from the dining room. There were no facilities for hand hygiene in the dining room. Six service users reported signs and symptoms consistent with influenza two to three days following the event.

Samples from 4 service users were submitted for laboratory testing and Influenza A virus infection was confirmed in 3 of the 4 samples. Two staff members also developed flu like illness. The vaccination coverage of the service users was 66% and for staff was 41.7%.

How to applying a risk assessment for the above case study on influenza above **case study:**

Establishing the context:

As per the above context, it is not possible to eliminate the risk of spread of acute respiratory virus infection in residential facilities, so it must be managed. The following are risk management process:

Risk identification:

In this case, the risk has been identified as cross-transmission of influenza virus in the context of a risk incident. Note that risk identification should not wait until an incident has occurred.

Risk analysis:

Assembling of a large numbers of service users in one area increases the opportunity for contact and droplet transmission of respiratory virus, but may be important for the service users overall

wellbeing. Attendance at the event by a resident with features of an acute viral respiratory tract infection increased the risk of transmission. Placing used tissues on the table could have increased opportunities for virus transmission. If waste receptacles were used opportunities for transmission would be less. The lack of hand hygiene facilities in the immediate vicinity could have resulted in poor hand hygiene compliance, with staff or service users not decontaminating their hands prior to eating, after sneezing or coughing. Low levels of resident and staff immunization are likely to have contributed to the spread of the infection.

Risk evaluation:

The balance of likelihood and consequences identify this as a 'very high risk' situation requiring additional risk treatment.

Risk Treatment-immediate measures may include:

- Informing the department of public health that there has been an outbreak
- Implement control measures as per infection prevention guidelines
- Providing hand hygiene facilities in common areas and encouraging service users and staff to use them.
- Provide waste receptacles in common areas, so people can dispose of tissues immediately.
- Additional work to promote immunization to all service users and staff

Other measures may include:

- Education of staff and service users on the importance of limiting contact with others if they have a flu like illness and reminding staff to stay home if they have a flu like illness
- Education of staff and service users on hand hygiene, respiratory hygiene and cough etiquette.
- Promoting influenza immunization of service users and staff
- Displaying posters and signage on hand hygiene and respiratory hygiene around the facility on an ongoing basis.

Monitoring and Review

Staff should continue to monitor service users for influenza-like illness and ongoing influenza-like illness surveillance should be heightened during the influenza season.

Immunization rates among staff and residents could be monitored, as well as monitoring the difference in case numbers from previous influenza outbreaks and outbreaks after the measures have been put in place.

Self-check questions 2.3

1. List activities and tasks that put clients and health workers at risk and indicate what should be done to minimize these risks.
2. Which activity is the first in risk management process?
   A. Risk analysis
   B. Monitoring
   C. Risk Treatment
   D. Risk identification

2.4. Safety management system

Occupational health activities for the prevention and management of infections in health care workers:

The goal of occupational health activities is to protect health care workers and their patients from acquiring an infection or any other hazard while working in a health care facility and visiting for service.

These activities are:

- Identifying work-related infection risks and hazards and preventing them
- Ensuring prompt and appropriate management of any occupational exposures to infections or other hazards
- Training all health care workers on infection preventation and control and patient safety practices and how to protect themselves against the risks of occupational exposures to infections and other hazards
- Monitoring and investigating potentially harmful exposures and outbreaks among health care workers Preventing infections by carrying out occupational health activities

Occupational health activities for management of job-related illnesses and occupational exposures:

The following are the key elements for occupational health programs in health care facilities:

- Oversight by a qualified health care professional or team
- Coordination among multiple hospital departments
- Medical evaluation at the start of employment
- Health and safety education and training of all staff
- Immunization programs
- Management of work restrictions and post-exposure treatment for occupational illnesses and exposures
- Counseling on protection from and management of accidental exposure to blood borne and other infectious pathogens
- Maintenance of personnel health records

Prevention strategies for infections relevant to occupational health in health care facilities:

- Prevent occupational exposure of health care workers by the application of Standard Precautions for all patients, at all times, as well as disease- or syndrome-specific Transmission-Based Precautions, to prevent exposures to infectious agents.
- Protect against vaccine-preventable diseases: all health care workers to receive vaccines to protect themselves against vaccine-preventable diseases.
- Manage occupational exposure following the national guidelines for management of occupational exposure to blood and body fluids
- Keep up to date by seeking additional information on specific diseases and local epidemiology

Occupational health activities for specific groups of health care workers:

Pregnant health care workers:

Pregnancy does not increase the risk of acquisition of infection for most occupationally acquired infections, and clinical manifestations are no more severe in pregnant women than in others.

However, pregnant health care workers may be anxious about potential infection and possible harm to their babies.

Laboratory staff

Health care workers in laboratories may be at increased risk of occupational exposure to the pathogens with which they work. Laboratory staff should receive specific training on the risks and how to avoid them.

Emergency response staff

Health care workers that respond to emergencies and transport patients are at a high risk of exposure to blood borne pathogens. Therefore they should have access to HBV vaccination, have adequate PPE and be taught to apply standard Precautions for all patients at all times.

Health care workers exposed to HIV and/or hepatitis B or C

HIV, HBV and HCV are the primary infectious agents that can be transmitted via exposure to bodily fluids. Especial attention is important for these workers.

Unit Summary

Occupational health deals with all aspects of work-related health and safety and has a

strong focus on prevention for infectious and non-infectious risks (such as injury).

Hazard is a situation or item that could cause harm. Risk is the chance, high or low, that a hazard will cause harm, injury or ill health.

Risk Assessment is defined as the process of assessing the risks associated with each of the hazards identified so the nature of the risk can be understood.

The activities and tasks that put the clients and workers at risk are: exposure to chemicals, risk of fire, repetitive use motion/injury, electrical hazard, accidental falls and falling of objects.

Risk assessment has five basic steps, which incorporates: risk identification, risk analysis risk evaluation, risk treatment and monitoring and review.

Five basic principles implementing in risk management are: avoid risks, identify risks, and analyze risks, evaluate risk and treat the risks

Unit Review Questions

You can assess yourself how well you have achieved the stated learning outcomes in this unit by answering the questions below. Write your answers in you note book and discuss with your peers and check your answers with the notes on the self-assessment questions at the end of this module.

1. List the specific groups of health workers who need especial care to prevent infection.

   Why these workers need especial care?

2. What is the difference between hazard and risk?

3. List the group of people who are responsible for risk management in health care setting.

4. The process of selecting and implementing measures is _____

   A. Risk identification
   B. Risk treatment
   C. Risk evaluation
   D. Risk monitoring

5. Case scenario?

In the health centre where you are assigned to serve the community as primary health care worker the number of cases of diarrheal diseases increases significantly since last week. The health workers confirm that there were 5 deaths from diarrhea in that mender. 25 cases come from that area with similar sign and symptoms of diseases and laboratory confirmation are treated and cured. The treatment team identifies some important points which might aggravate the transmission of the diseases while conducting examination.

The points are:

- All cases responds that they have used water from unprotected spring
- More than half of cases and near half of households in that mender have no toilet.
- All households have no habit of treating water at home
- The community have the habit of late to seek treatment while they encounter health problems
- Poor personal hygiene especially poor hand washing is common problem in that mender

Based on the above information, conduct the risk assessment by considering the five basic principles of risk assessment.

Unit Project Work

Project One:

You are one of primary health care worker in the community. One of the responsibilities of primary health care worker is preventing the infection at work place. Assume that in the health post you are working with other health workers, you are assigned to clean floor of delivery room highly contaminated by the spills of blood and body fluids. The head of health post provides 35% powder chlorine hypochlorite to disinfect the floor of delivery room. Now based on the above information perform the following activities:

1. Calculate the chlorine powder in gm/liter which is used to form 0.5% chlorine solution for disinfection.
2. Prepare 0.5% chlorine solution by using safe water
3. Clean the room by considering the condition of contamination

Instructions:

- Every student is expected to perform each activities
- Based on the local condition the instructor can make groups and attend the performance of each student
- Do not be negligence in preventing yourself from infection
- After performing seek the feedback from your instructor to check whether you did well or not.

Answers keys for self check questions

Self-check 1.2:

1. There are six basic elements in diseases transmission chain which are: infectious agent (disease-causing organism, reservoir (habitat for an infectious agent, portal of exit (a gateway through which the agent leaves the host or reservoir), mode of transmission (ways of transmission) and portal of entry (the gate way through which an infectious agent enters in to the susceptible host).

Self check 1.3:

1. **A. False**:
2. Because the aim of standard precautions is to reduce the risk of transmitting microorganisms form both known and unknown source of infection to susceptible host.

Self check 1.4:

1. Sources of infection for diseases in health care setting are many. The major source of infection include: Human being (ill, carrier and a person with in incubation period of any diseases), environment (air, water, soil and any contaminated material) and vectors

Self check 1.5.1

1. Parts of hands usually neglected while washing are; finger tips, palm of hands, back of hands and thumbs.
2. Hand washing is performed based on procedures
3. Anti septic hand rubs performed based on procedures

Self check 1.5.1

Types of Personal protective equipments commonly used are:

- Head covering- provides protection for hair and scalp
- Google- provides protection for eyes
- Face masks-provides protection for face
- Gloves- provides protection for hand
- Gowns- provides protection for-upper body, skin and cloth
- Apron- provides protection for front of the body

- Boots-provides protection for lower legs and feet

2. Glove worn properly based on the wearing and removing procedure

Self check 1.5.1.

A. Unsafe injection exposes patients to different risks. The commonly known harms are:

- Transmission of blood born infections such as HBV, HCV, HIV/AIDS.
- Developing abscesses due to infection
- The nerves injury may cause paralysis and allergic reactions shock

B. Unsafe injection exposes health care workers to many communicable diseases such as

Hepatitis

C. (HCV), Hepatitis B (HBV), HIV and other blood borne pathogens.

Self check 1.5.1

Used instruments and equipments are categorized based on the status of risk the pose to patients and health care workers. The categories includes: critical, semi-critical and non-critical. Regarding the level of disinfection critical items such as reusable surgical instruments needs sterilization, semi-critical such as respiratory instruments, specula and endoscopes needs high level disinfection where as non-critical cleaning such as blood pressure cuffs, stethoscopes need cleaning only.

Self check 1.5.1

B. Do not store clean linen beside used linen is true answer, because if we store it with disinfected linens there is a chance of cross contamination from solid linens to sterile once.

The amount of chlorine (gm.) to be added in 1 liter of water to get 0.5% chlorine solution from 70% chlorine powder is:

Grams of chlorine = $\frac{\text{\% dilute}}{\text{\% concentrate}}$ * 1000

Gram/liter = $\frac{\text{0.5\% dilute}}{\text{70\%}}$ * 1000 = **7.14** gm/lit

Now add 7.14 grams to 1 liter of water. Now you get 0.5% of chlorine solution for disinfection.

Self check 1.5.2

1. The three routes of infection require transmission based precaution are: contact Precautions, droplet precautions and airborne Precautions
2. Common examples of diseases which need transmission based precaution are:
   - Contact precautions: blood from an infected person and contact with contaminated materials
   - Droplet precautions: influenza, meningitis
   - Airborne precautions: measles, chicken pox

Unit two Self-check answers

Self check 2.3.

1. Common activities and tasks that put clients and health workers at risk are: exposure to chemicals, fire accident, and repetitive use injury, injury due to electrical hazards and accidental falls and falling objects. We should have prevention strategies for each.

Strategies to prevent for:-

Exposure to chemicals; Storing in safe place, minimizing contact, using appropriate PPE when there is contact etc

Fire accident: Availing fire extinguisher, educating people how to use it, availing exit routes in building.

Repetitive use injury: Having adequate rest, taking care for body positioning, use appropriate PPE

Injury due to electrical hazards: Regular check up of electrical installation, avoiding unsafe contact and utilization of electrical instruments and equipments, using appropriate PPE etc.

Accidental falls and falling objects: creating work place healthful

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Module III

Basic Kaizen

Contents

Module Description

This module equips students with the necessary knowledge, skills and mindset to understand and apply Kaizen principles effectively. It covers basic principles and importance of Kaizen, waste elimination, and the 5S methodology for workplace efficiency. Through practical exercises, students learn to identify and eradicate waste, ultimately preparing them to drive continuous improvement in future endeavors.

UNIT 1

Basic Kaizen Concepts

1.1 Introduction to Kaizen

Kaizen, originating from Japan, embodies the philosophy of continuous improvement. It emphasizes the relentless pursuit of small, incremental changes in processes, systems, and behaviors to achieve greater efficiency, quality, and effectiveness. The term "Kaizen" itself translates to "change" (kai) for the better (zen), reflecting its core principle of ongoing improvement. At its essence, Kaizen is not a one-time event or a grand overhaul but rather a daily practice ingrained in the culture of an organization. It involves the collective efforts of all employees, from top management to frontline workers, who are encouraged to identify problems, propose solutions, and implement improvements in their respective areas of work. Kaizen fosters a culture of innovation, empowerment, and continuous learning, where even the smallest improvements contribute to significant long-term gains. By embracing Kaizen, organizations strive to stay agile, adaptive, and competitive in a rapidly evolving world.

Learning outcomes:

At the end of this unit, students will be able to:

- Understand meaning of Kaizen and its basic concept
- Understand origin of Kaizen
- Performing basic Kaizen Principles
- Recognize the benefit of Kaizen

Key terms: Kaizen, PDCA, Improvement

1.1.1 The meaning of Kaizen

Kaizen is a Japanese term that translates to "continuous improvement" or "change for the better." It's a philosophy or methodology focused on making incremental improvements in processes, products, or services over time. Rather than seeking major, revolutionary changes, kaizen emphasizes small, gradual improvements that can be implemented by everyone in an organization. This approach encourages employees to constantly look for ways to streamline

processes, reduce waste, and enhance quality, resulting in overall efficiency gains and a culture of continuous improvement within the organization. Kaizen is widely used in various industries around the world as a key element of lean manufacturing and management practices. Kaizen is continuous improvement that is based on certain guiding principles:

And much more! One of the most notable features of kaizen is that big results come from many small changes accumulated over time. However, this has been misunderstood to mean that kaizen equals small changes. In fact, kaizen means everyone involved in making improvements. While the majority of changes may be small, the greatest impact may be kaizen that are led by senior management as transformational projects, or by cross-functional teams as kaizen events.

1.1.2 Origin of Kaizen

Kaizen traces its roots back to post-World War II Japan, a time when the country faced economic devastation and reconstruction challenges. In this context, Japanese industries sought innovative approaches to rebuild their economy swiftly and sustainably. It was during this period that the foundations of Kaizen were laid by visionary leaders and forward-thinking organizations, notably Toyota. Toyota's production system, often referred to as the Toyota Production System (TPS), became synonymous with Kaizen principles. TPS revolutionized manufacturing by introducing concepts such as Just-in-Time (JIT) production, Total Quality Management (TQM), and continuous improvement. These practices enabled Toyota to achieve exceptional levels of efficiency, quality, and flexibility, setting a benchmark for industries worldwide. Over time, the success of TPS and Kaizen philosophy transcended borders, inspiring organizations across diverse sectors and geographies to adopt similar principles. Today, Kaizen has evolved into a globally recognized management philosophy and a cornerstone of operational excellence, driving innovation and improvement across industries and disciplines.

1.2 Principles of Kaizen philosophy

The principles of Kaizen philosophy encompass a set of fundamental beliefs and values that guide organizations in their pursuit of continuous improvement and excellence.

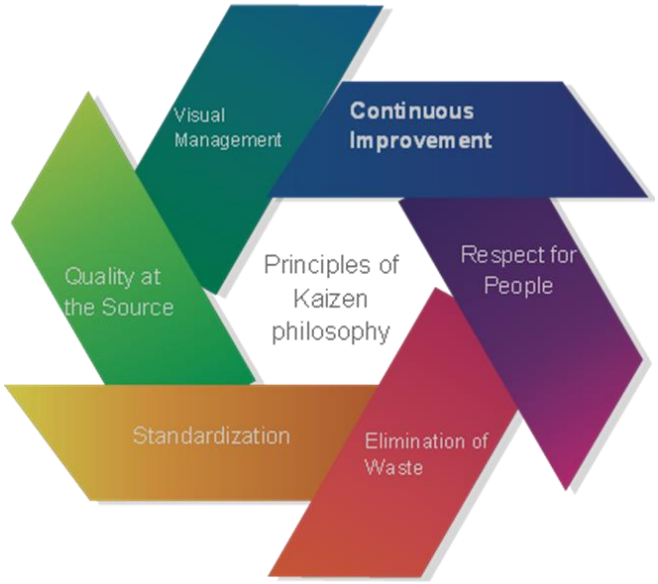


Figure 1.1. Key principles of kaizen

These principles form the cornerstone of Kaizen implementation and are essential for fostering a culture of innovation, collaboration, and sustained growth. Here are the key principles of Kaizen:

- **Continuous Improvement:** Kaizen emphasizes the concept of continuous, incremental improvement in all aspects of operations, processes, and systems. It encourages organizations to constantly seek opportunities for enhancement, no matter how small, to achieve greater efficiency, quality, and customer satisfaction over time.
- **Respect for People:** Central to Kaizen is the belief that every individual within the organization possesses valuable insights, knowledge, and expertise. Therefore, Kaizen promotes a culture of mutual respect, trust, and empowerment, where employees are actively engaged, encouraged to voice their ideas, and given the autonomy to implement improvements.
- **Elimination of Waste:** Kaizen advocates for the identification and elimination of waste in all forms, including overproduction, waiting times, unnecessary motion, defects, and

excess inventory. By reducing waste, organizations can streamline processes, optimize resource utilization, and enhance overall efficiency and productivity.

- **Standardization:** Standardization is essential for ensuring consistency, reliability, and repeatability in processes and operations. Kaizen encourages the establishment of standardized work procedures, protocols, and guidelines to maintain quality, reduce variability, and facilitate continuous improvement efforts.
- **Quality at the Source:** Kaizen promotes the principle of "quality at the source," which means identifying and addressing quality issues at their origin rather than detecting and correcting defects downstream. By instilling a culture of accountability and responsibility for quality among all employees, organizations can prevent errors, defects, and rework, thereby improving product and service quality.
- **Visual Management:** Visual management techniques, such as visual controls, signage, and displays, play a crucial role in Kaizen implementation by making information, processes, and performance indicators easily accessible and understandable to employees. Visual management tools help create transparency, facilitate communication, and support continuous monitoring and improvement efforts.

These principles serve as guiding principles for organizations embarking on the Kaizen journey, helping them create a conducive environment for innovation, teamwork, and sustainable growth. By embracing these principles, organizations can foster a culture of continuous improvement, drive operational excellence, and achieve long-term success in today's dynamic and competitive business landscape.

Self check questions 1

1. Describe the significance of continuous improvement in the context of kaizen philosophy. How does it contribute to organizational success?
2. Explain the role of Toyota's production system(TPS) in shaping the principles of kaizen. How did TPS revolutionize manufacturing practice?
3. Identify and discuss three key principles of kaizen philosophy outlined in the next. How do these principles contribute to fostering a culture of continuous improvement within organizations?

4. How does kaizen promote employee empowerment and engagement in the improvement process? Provide examples of how employees can actively participate in kaizen initiatives.

1.3 Key Concepts of Continuous Improvement

Continuous Improvement (CI) is an ongoing effort to improve products, services, or processes incrementally over time. It is a fundamental principle in various management philosophies, such as Total Quality Management (TQM) and Lean Management. Key concepts of continuous improvement include:

1.3.1 Incremental changes vs. radical improvements

- **Incremental Changes:** These are small, gradual adjustments made to existing processes, products, or services. They are often easier to implement and less disruptive to the organization.
- **Radical Improvements:** Also known as breakthrough improvements, these involve significant and transformative changes to processes or products. They can lead to substantial gains in efficiency, quality, or innovation but may require more resources and time to implement.

Table 1: **Incremental changes vs. radical improvements**

Criteria	Kaizen (Incremental Changes)	Innovation (Radical Improvements)
Effect	Long term not breakthrough	Short-term breakthrough
Steps	Small steps	Big steps
Teamwork	Permanente action with gradual rising effects	Incidental action with immediate effect
Change	gradual and permanent	Sudden and single
Engagement	All	Chosen leaders
Approach	Team effect, process approach	Individual ideas and actions
Work method	Maintenance and improvement	Extinguishing and rebuild
Ideas	Conventional knowhow and traditional technology	Usage of technology, breakthrough, new innovation and theory
Practical requirements	Small investment, big effort	Big investment, small effort

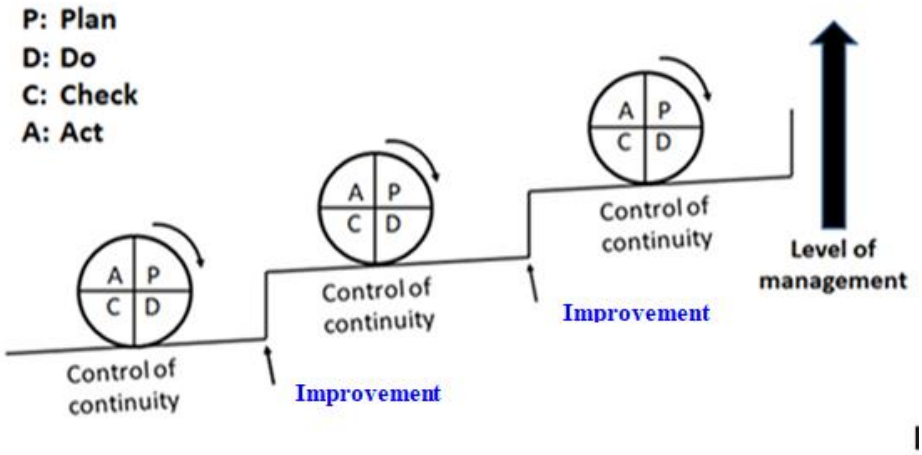
Orientation	For people	For technology
Assessment criteria	Process and engagement in achieving of better result	Result directly affect on profits

1.3.2 The PDCA Cycle: A Blueprint for Continuous Improvement

The Plan-Do-Check-Act Cycle (PDCA Cycle) is a four-step model for systematic problem solving and continuous improvement. It offers a simple and structured way for resolving business-related issues and creating positive change. This framework is widely recognized as the basis for enhancing the quality of processes, products, and services by following a logical sequence of four steps: Plan, Do, Check, and Act.

The PDCA cycle model can be applied in most kinds of projects and improvement activities, whether they are breakthrough changes or smaller incremental enhancements. For example, it can be effectively utilized when aiming to enhance employee skill levels within an organization, change the supplier of a product or service, or increase the quality of care and patient engagement within a hospital.

A common practical example of the PDCA cycle can be illustrated when dealing with customer complaints. This scenario involves steps like reviewing, categorizing, and prioritizing the existing complaints, generating potential solutions for addressing the most frequent complaints, conducting pilot surveys with sample customers to test new options, collecting and analyzing customer data and feedback, and ultimately implementing lessons learned on a larger scale. The above steps represent the PDCA cycle in action



The Figure 1. 2. PDCA Cycle Model

The Four Phases of the PDCA Cycle

The PDCA cycle begins with the Planning phase which involves the identification of the problem and objectives. During this phase, a collaborative effort is made to agrees on the problem to be solved or the process to be improved. Subsequently, an in-depth analysis of the existing as-is situation is conducted, alternative solutions are identified, and the most promising solution is selected and scheduled for implementation.

In the Do phase, the selected solution is put into action on a limited scale. This phase also involves ongoing progress measurement, data collection, and feedback gathering to facilitate subsequent analyses.

The Check phase involves analyzing the collected data and feedback and comparing the outcome against pre-established objectives. This phase allows to evaluate how well the solution has worked and where further enhancement may be needed. Additionally, it involves the identification of unexpected issues and the gathering of key learning. It is important to note that the Do and Check phases may need to be repeated until the desired results are achieved.

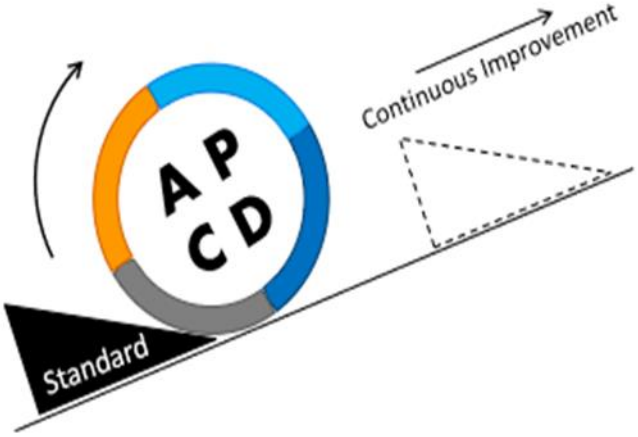


Figure1. 3. PDCA and Standardization

The Act phase is the point at which the chosen solution is fully integrated. This phase requires taking actions based on the insights acquired from the Check phase. A plan for full-scale implementation is carried out, considering the associated costs and benefits. The Act phase also concerned with standardizing, documenting, sustaining the improved process, as well as integrating it into the organization's system.

The utilization of the PDCA cycle doesn't necessarily stop once the Act phase is completed. The improved process often becomes the new baseline, which may prompt a return to the Plan phase. Multiple iterations of the PDCA cycle may be essential for a permanent resolution of the problem and the attainment of the desired future state. Each cycle brings one closer to their goals and extends their knowledge further.

1.3.3 Employee involvement and empowerment

Continuous improvement relies heavily on the participation and engagement of employees at all levels of the organization. Employees are encouraged to identify problems, suggest solutions, and actively participate in improvement initiatives.

Empowerment involves giving employees the authority, autonomy, and resources to make decisions and implement changes in their work areas. This fosters a culture of ownership and accountability for improvement.

1.3.3 Quality Circles and teamwork

Figure 1.4: Quality Circle

Quality circles are small groups of employees who voluntarily come together to identify, analyze, and solve work-related problems within their area of expertise. These circles promote teamwork, collaboration, and shared responsibility for quality and improvement. They provide a forum for employees to exchange ideas, share best practices, and contribute to organizational goals.

Continuous improvement is not a one-time initiative but rather a continuous journey towards excellence. By embracing these key concepts and methodologies, organizations can foster a culture of innovation, efficiency, and quality that drives sustainable growth and competitiveness.

1.4 Benefits of Implementing Kaizen

Implementing Kaizen, a Japanese philosophy of continuous improvement, offers a range of benefits to organizations. Here's a breakdown of the key advantages:

1.4.1 Increased Productivity and Efficiency:

- Streamlined Processes: Kaizen encourages the analysis and optimization of processes to eliminate bottlenecks, redundancies, and unnecessary steps.
- Standardized Work: By standardizing procedures and best practices, Kaizen ensures consistency and efficiency across operations.
- Continuous Flow: Kaizen aims to establish continuous flow production, reducing lead times and increasing throughput.
- Just-in-Time (JIT) Production: Kaizen principles align with JIT production, enabling organizations to produce goods only as needed, minimizing inventory holding costs and maximizing resource utilization.
- Automation and Technology Integration: Kaizen encourages the adoption of automation and technology to enhance efficiency and reduce manual workloads

1.4.2 Cost Reduction and Waste Elimination:

- Identification of Waste: Kaizen methodologies, such as value stream mapping and gemba walks, help identify and categorize different types of waste, including overproduction, inventory excess, waiting time, defects, transportation, motion, and underutilized talent.

- Kaizen Events: These focused improvement activities bring together cross-functional teams to address specific areas of waste and inefficiency, resulting in targeted cost reductions and process improvements.
- Cost-Benefit Analysis: Kaizen promotes a culture of cost-consciousness and continuous improvement, encouraging employees to identify cost-saving opportunities and implement solutions that offer a favorable return on investment.

1.4.3 Improved Quality and Customer Satisfaction:

- Root Cause Analysis: Kaizen emphasizes the importance of root cause analysis to identify and address the underlying factors contributing to quality defects and customer dissatisfaction.
- Error Proofing (Poka-Yoke): Kaizen encourages the implementation of error-proofing techniques to prevent mistakes and defects before they occur, ensuring consistent quality and reliability.
- Customer Feedback Integration: Kaizen involves gathering and incorporating customer feedback into improvement efforts, aligning products and services with customer needs and expectations.
- Continuous Feedback Loops: Kaizen promotes the establishment of continuous feedback loops to monitor and improve quality performance over time, fostering a culture of continuous learning and adaptation.

1.4.4 Employee Morale and Satisfaction:

- Empowerment and Involvement: Kaizen empowers employees at all levels to contribute ideas, suggestions, and solutions for improvement, fostering a sense of ownership and pride in their work.
- Skill Development: Kaizen provides opportunities for skill development and cross-functional collaboration through participation in improvement teams, training programs, and knowledge sharing initiatives. Quality circles are small groups of employees who voluntarily come together to identify, analyze, and solve work-related problems within their area of expertise. These circles promote teamwork, collaboration, and shared

responsibility for quality and improvement. They provide a forum for employees to exchange ideas, share best practices, and contribute to organizational goals.

- Continuous improvement is not a one-time initiative but rather a continuous journey towards excellence. By embracing these key concepts and methodologies, organizations can foster a culture of innovation, efficiency, and quality that drives sustainable growth and competitiveness.
- Recognition and Rewards: Kaizen recognizes and rewards employee contributions to improvement efforts, reinforcing a culture of recognition, appreciation, and motivation.
- Job Enrichment: Kaizen encourages job enrichment by assigning employees meaningful tasks and responsibilities related to improvement projects, enhancing job satisfaction and engagement.

Self check question 2

1. What are the main differences between incremental changes and radical improvements in the context of continuous improvement?
2. Describe the four phases of the PDCA Cycle briefly.
3. How does employee involvement contribute to continuous improvement efforts within an organization?
4. What are quality circles, and how do they support teamwork and improvement initiatives?
5. Name two benefits of implementing Kaizen related to increased productivity and efficiency.

Examples of Successful Kaizen Practices

- **Case 1. Toyota Production System (TPS)** Toyota is renowned for its implementation of Kaizen principles in its production processes. TPS emphasizes continuous improvement, employee empowerment, and waste reduction. For example, Toyota implemented "Just-in-Time" production, where parts are only ordered and used when needed, reducing inventory costs and improving efficiency.
- **Case 2.** Kaizen in Retail Retail giants like Walmart have integrated Kaizen into their operations to optimize inventory management and enhance customer service. Walmart

uses Kaizen principles to improve store layouts, reduce shelf restocking times, and minimize waste in its supply chain, resulting in improved customer satisfaction and increased profitability.

- **Case3. Kaizen in** a local bakery **Small Businesses:** Even small businesses can benefit from Kaizen practices. For example, a local bakery implemented Kaizen to improve its baking processes, reduce waste, and enhance product quality. By involving employees in brainstorming sessions and implementing small, incremental changes, the bakery achieved higher efficiency and customer satisfaction.

Unit summary

Kaizen is a Japanese philosophy that emphasizes continuous improvement, focusing on small, incremental changes to achieve greater efficiency, quality, and effectiveness. The term "Kaizen" translates to "change for the better" and is not just about small changes, but also about everyone involved in making improvements. Kaizen has its roots in post-World War II Japan, where it was adopted by industries such as Toyota, which became synonymous with the Kaizen philosophy.

The Kaizen philosophy is built on several key principles. Continuous improvement is at the heart of Kaizen, emphasizing the need for ongoing improvement in all aspects of operations. Respect for people is also a key principle, promoting a culture of mutual respect, trust, and empowerment where employees are actively engaged and encouraged to voice their ideas. Elimination of waste is another important principle, as is standardization, which ensures consistency, reliability, and repeatability in processes and operations. Quality at the source is also a key principle, which means identifying and addressing quality issues at their origin.

A Kaizen board is a bulletin board used to disseminate information about Kaizen activities at the workplace or company. It serves as a means of management-employee communication, helping to foster employees' sense of participation, recognition, and motivation in Kaizen activities. In addition to the Kaizen board, employee involvement and empowerment are critical components of continuous improvement. Employees are encouraged to take ownership of their work and identify areas for improvement, which helps to foster a sense of responsibility and accountability.

The PDCA cycle is a four-step model for systematic problem-solving and continuous improvement. The cycle consists of Planning, Doing, Checking, and Acting. It is used to enhance the quality of processes, products, and services by following a logical sequence of four steps.

Quality circles are small groups of employees who voluntarily come together to identify, analyze, and solve work-related problems within their area of expertise. These circles promote teamwork, employee engagement, and continuous improvement.

Overall, Kaizen is a powerful philosophy that can help organizations improve their efficiency, quality, and effectiveness by promoting continuous improvement and employee involvement. By embracing the principles of Kaizen and using tools such as the Kaizen board and PDCA cycle, organizations can create a culture of continuous improvement that benefits both employees and customers.

Unit Review Questions

Part I: Choose the best answer

1. Which one of the following is true about kaizen?
   A. Change for better
   B. Reduce productivity
   C. Continuous improvement
   D. A& C
2. The origin of kaizen is_____
   A. England
   B. Korea
   C. Japan
   D. Ethiopia
3. Which one of the following is the benefit of kaizen?
   A. To make work place more pleasant
   B. To improve customer satisfaction
   C. To develop members' capability
   D. All
4. Kaizen refers to _____
   A. Continuous improvement
   B. Intermittent improvement
   C. Discontinuous improvement
   D. Radical improvement
5. In the process of Kaizen, improvements are accomplished gradually in small increments.
   A. True
   B. False
6. Who is encouraged to participate in the practice of Kaizen within organizations?
   A. Only top management
   B. Only frontline workers
   C. Only middle management
   D. All employees from top management to frontline workers

7. What is the purpose of the PDCA cycle in continuous improvement?
    A. To identify problems but not implement solutions
    B. To execute improvement plans without measuring results
    C. To provide a framework for iterative improvement
    D. To involve employees in decision-making without empowerment

UNIT 2

Identify and Eliminate Waste

2.1 Introduction to Waste

In Japanese, "muda" translates to "waste." In the context of Kaizen, muda refers to any activity or process that does not add value to the final product or service from the customer's perspective. Identifying and eliminating muda is crucial for improving efficiency, reducing costs, and enhancing overall quality.

Within a kaizen culture, **waste** is anything that doesn't add value from the customer's perspective. It includes activities that consume resources, increase the cost of products or services but contribute zero value to the customer, and therefore should be eliminated. **Waste Analysis** is one of the core principles of kaizens' thinking that involves the identification, quantification, elimination, and prevention of waste. It is also one of the easiest ways an organization can improve its operations.

Waste takes many forms and can be found at any time and in any place. Additionally, the application of waste analysis is universally relevant across manufacturing, service, and office environments. Many classifications of waste exist, with the **Eight Wastes** model being a widely adopted framework across multiple industries. Categorizing waste into these eight forms makes them easier to identify and helps identify priorities for action. In the next sections, we'll elaborate more the eight types of waste.

Learning outcome:

At the end of this unit, students will be able to:

- Understand the concept waste
- Identify various types of waste
- Develop strategies to eliminate waste
- **Key terms:** Waste/Muda

Activity

Dear students, discuss the following Waste questions with your peers

a. How can you define waste in your own context?
b. Can you list down example of wastes?
c. Can you identify any instances of time waste in your routine activities?
d. Discuss the importance of adopting a continuous improvement mindset in waste reduction efforts. How does this mindset contribute to organizational success?

Self-Check 2

Dear students, discuss the following Waste questions with your partners/

A. What are some examples of physical waste that you encounter in your daily life or work environment?
B. Can you identify any instances of time waste in your routine activities?
C. . Have you noticed any energy wastage practices in your home or workplace?
D. How about financial waste?
E. Can you think of any instances where money is spent unnecessarily or inefficiently?

2.1.1 What is Muda/waste?

Waste is any action or step in a process that does not add value to the customer. In other words, waste is any process that the customer does not want to pay for. The original seven wastes (Muda) was developed by Taiichi Ohno, with the **Eight Wastes** model being a widely used framework today.

There are two types of wastes: obvious wastes and hidden wastes. It is important to uncover and eliminate the latter since they are usually bigger. Wastes take the shape of an iceberg; the tip consists of the obvious wastes while the seen bulk under the water contain the hidden wastes. Wastes are not necessarily ugly, and most are outside the waste can! Waste can be in the form of unnecessary output, input, or processing. It can be in the form of materials, stocks, equipment, facilities, manhours, utilities, documents, expenses, motion, and other activities that do not add value.

Self-check questions 3

1. Define waste according to the context of Kaizen philosophy.
2. Explain the difference between obvious wastes and hidden wastes.

3. Provide examples of different forms.

2.2 Types of Waste

Waste is one of the biggest enemies of manufacturing efficiency and profitability. It can increase your costs, lower your quality, and reduce your customer satisfaction. But how do you identify and eliminate waste in your manufacturing processes? One of the most widely used methods is based on the concept of Muda.

Muda is a Japanese word that means waste or futility, and it refers to any activity that does not add value to the product or service. According to the lean philosophy, there are seven types of Muda that you need to eliminate or minimize in manufacturing/Service processes. In this unit, we will explain what these types are and how you can measure and reduce them using some practical examples.

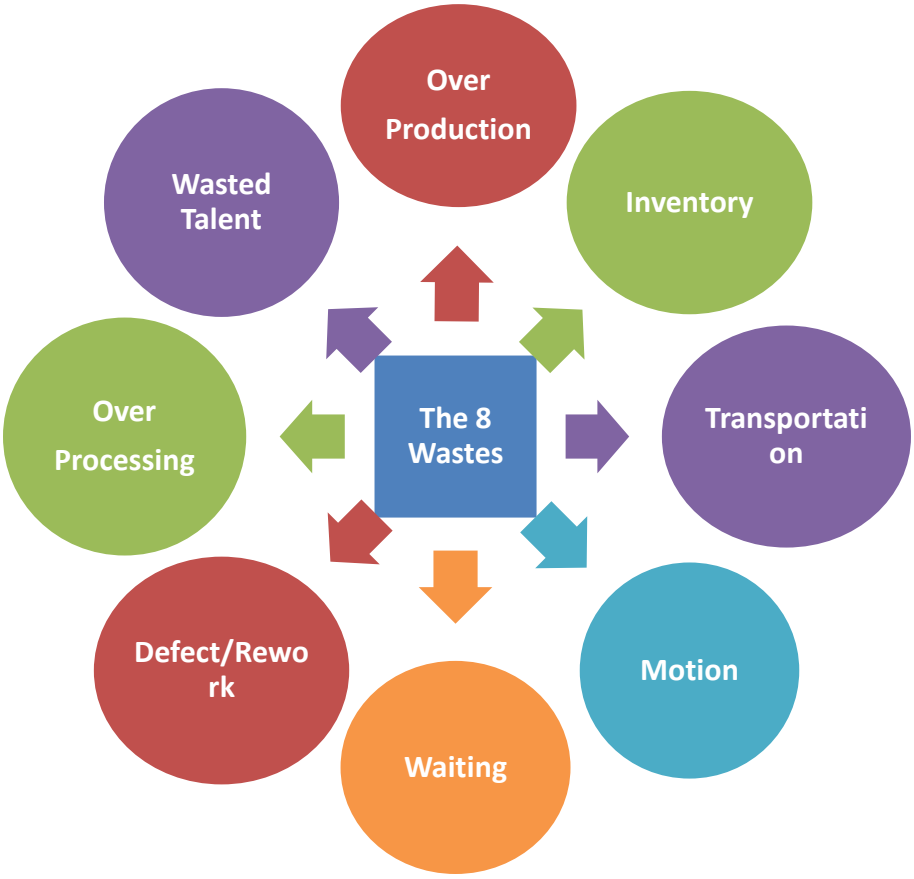


Figure 5: The 2.1 wastes/Muda

Following are types of waste: -

1. Overproduction:

Over-production is producing greater quantities or making more of something than what is actually demanded or required by the customer. It is thought to be the worst of the eight wastes as it contributes in creating the other types of waste. Over-production consumes more materials, promotes a batch and queue system, increases lead times, hides quality problems, and may prevent other activities from taking place.

Figure 2.2. Overproduction

Examples

- Creating parts or information not needed by the downstream process.
- Producing faster than the downstream process or customer demand.
- Producing information that will never be used or sending reports that will never be looked at.
- Printing multiple versions of the same publication hoping that you will distribute all.

Improvement Ideas

- Produce only what customers want and when they want it.
- Produce as close to the schedule as possible.
- Implement Pull and Kanban

2. Excess inventory:

Excess inventory involves having more materials or information than what is actually needed. Inventory takes up valuable space, creates the need for more manpower and equipment, ties up money that can be used elsewhere, and has a significant impact on working capital and

operational costs. While some inventory is necessary, most processes can be managed more efficiently to minimize excess inventory.

Figure 2.3. Basic types of inventories

Examples

- Storing raw materials ahead of requirements.
- Expired, obsolete, and held-for-inspection inventory.
- Archiving documents that are not required and will never be used in the future.
- Storing computer programs that will never be used on hard drives.
- Keeping outdated and duplicated files.
- Giving people documentation they will never read.

What causes it?

- Overproduction; in many cases down to line imbalances or large batch sizes
- Poor sales or distribution performances, often connected to large minimum purchase standards
- Misunderstanding the market need or overestimating future business performance

Why is excessive inventory a waste?

- Inventory takes unnecessary space.
- Money spent on inventory can be used in more worthwhile endeavors.
- When problems occur with the product, product inventory is suspect and needs to be reviewed.
- It cost money to store inventory including bins, carts, shelves, etc.

Improvement Ideas

- Keep track of inventory levels.
- Reduce unnecessary safety stocks.
- Avoid buying in bulk unless you are sure you will use all of it.
- Apply line balancing and Kanban.

3. Transportation Waste

While transportation is a necessary element of any production process, excessive or inefficient transportation is considered a form of waste, known as **Transportation Waste.** Transportation waste can involve movement from one jobsite to another or from a material laydown area to the work area. Why is this problem? Among other things, this waste is a productivity killer, and it exposes your materials to the potential for damage

Excessive transportation often results from poor layout of the production facility, inadequate storage planning, or suboptimal supply chain management. Transportation waste not only increases the time it takes for a product to move through the production process, but can also lead to damage or loss of materials, increased costs, and heightened risk of accidents or injuries.

Generally, transportation waste is the unnecessary movement of manufacturing resources outside of the area where production occurs.

Not all transportation is waste, but unnecessary movement adds expense and risk without adding value. Because customers won't pay for things that don't add value, manufacturing waste can hurt your company's competitiveness and profitability.

Figure 2.4. Transportation waste

Examples

- Having the raw material storage area and the loading area at opposite ends.
- Storing office supplies far away from the office area.
- Moving documents for approval or seeking authorization.
- Moving patients from department to department
- Unnecessary movement of products from production to sale
- Unnecessary movement of materials or products in the production process
- Unnecessary movement of tools or equipment in the production process

What causes it?

- Poor route planning and distant suppliers or customers
- Unnecessarily complex material flows or production processes
- Disorganized workplaces which fail to minimize transit distances or expense.

Why is transportation a waste?

- You do not add value to the product as it is being moved
- Movement time costs the company money.
- Possible product damage during the movement.
- Possible product misplacement.
- Unnecessarily waste of energy to move the product.
- Costs of moving product including carts, bins, rollers and automation

Improvement Ideas

- Find ways to reduce the distance between work areas.
- Relocate items to be closer to where the work is performed.
- Try to transport in bulk and in both directions.

4. Motion Waste

Motion waste/unnecessary motion/movement, or wasted motion, refers to the movement performed by individuals that is not required and will not add value to the product or service. Not only does this consume time and energy, but it can also increase health and safety issues, impacting operational reliability. Unnecessary movement often results from inadequate workplace layout design or poor ergonomic considerations or inefficient work processes, leading to fatigue, injuries, and reduced productivity

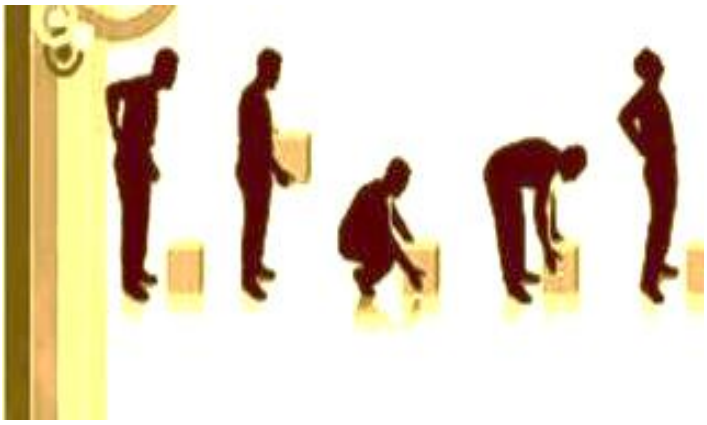


Figure 2.5. Muda of Motion

Examples

- Moving too much or travelling farther than necessary to accomplish a task.
- Having to walk back and forth to get tools during maintenance.
- Having to bend or twist because of poor ergonomic design.
- Placing printers and photocopiers far away from offices.

What causes it?

- Poorly designed production facilities
- Non-standardized production processes
- Unclear flows of materials, down to either poor operational management or poor training

Improvement Ideas

- Evaluate the flow and layout to identify chances to streamline the process.
- Relocate the required tools at the point of use.
- Improve workplace ergonomics.
- Assembly lines can minimize worker movements
- Clear categorization and availability of needed tools or equipment
- Effective training procedures and easily accessible and actionable standard operating procedures

5. Waiting-Time Waste

Waiting refers to the idle time resulting from unnecessary delays within a process. It occurs when a product is not being processed or in transport, or when an individual is waiting for a work or service to get completed, and that costs time and money. Any time a product or an individual is waiting, there is no value being added, lead times are increased, and wasted time is transferred to the customer in the form of increased costs.

When two interdependent processes are not synchronized, idle time is produced, and we have waiting waste.

Figure 2.6.waiting Time waste

Examples

- Waiting for a teacher to start class
- Waiting for the maintenance department to repair a breakdown.
- Waiting for the changeover to be completed.
- Waiting for a slow machine to operate.

- Waiting for a preceding operator to complete his/her work.
- A customer waiting for a service.
- Waiting for a meeting to start.
- Experiencing poor computer system performance.

Improvement Ideas

- Observe what keeps people waiting.
- Measure waiting time and make it visible.
- Allocate more resources at the bottleneck areas to increase their capacities.
- Improve scheduling and coordinate.

6. Over Processing Waste

Over processing means putting more into a product than is valued by the customer. The goal is to do only the level of processing that matches usefulness and necessity. Similar to motion, this type of waste is very hard to notice and eliminate in business.

Over-processing will increase machining time, material handling time and add more process steps. Due to over processing the cost of the product is increased that will pay by the customer. For reducing over processing on products, consider standard job specifications for manufacturing.

An example of over processing in production is painting unseen areas. Machines that are over processing because the whole process flow is directed through them are also an example of this kind of waste. Over processing can also be a result of unnecessary production steps, using older, outdated methods, or not having standard work plans. It can also be caused by slow approval process.

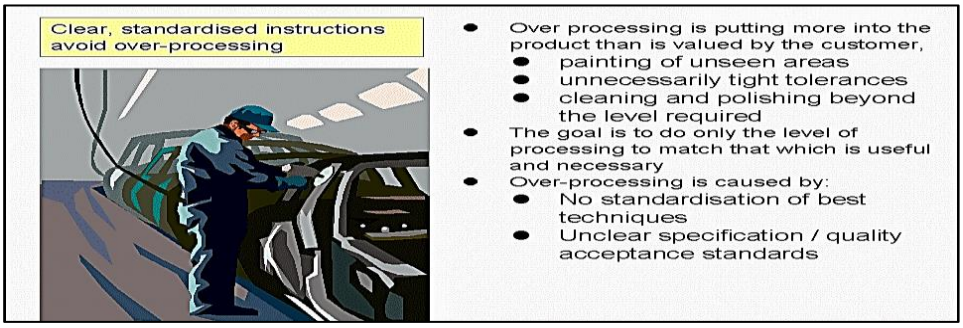


Figure 2.7.over-processing

Examples

- Repeating work which has already been done (mixing a mixed cup of coffee).
- Painting areas that are exposed to dirt or corrosion.
- Using tools that are more precise or using the wrong tool.
- Completing reports in a level of detail that is not required.
- Duplication of work and filling multiple forms with repeated data.

Improvement Ideas

- Find ways to do less and to use less.
- With every task try just do it once.
- With every document try to just touch it once.
- Provide clear standards for every process.
- Understand customer values

7. Defects Waste

Defects and errors occur when a product or service fails to fulfill its intended purpose, or when the production process does not complete perfectly right the first time. This waste is the most obvious type of waste and the easiest to relate. Whenever a defect occurs during a production process, extra costs are incurred as a result of scrapping or reworking the defective products. Moreover, if it conveyed to the customer, additional costs are incurred as a result of customer returns and negative reputation.

Figure 2.8. Defect

Examples

- A manufacturing faulty part that requires rework or needs to be scrapped.
- Producing the wrong product.
- Delivering a product to the wrong destination.
- Not on time in full delivery.
- Typos and spelling mistakes in a resume.
- Missing information or incorrectly completing an application.
- Customer receives the wrong service or nothing at all.

What causes it?

- Poor management of the production processes
- Inadequate suppliers or third party production elements
- Unclear specifications and poor manufacturing documentation

Improvement Ideas

- Find where the error occurs and analyze the root causes.
- Solve the problem as early as possible.
- Avoid multitasking and mind wandering.

8. Unused Human Skills

Not using the potential and creativity of employees and failing to involve them is a waste. Organizations employ individuals for the specific skills they possess, and it is wasteful not to

leverage their many other skills and capabilities. Many companies recognize that their most valuable assets are their employees. It is only by exploiting the ideas and skills of employees that companies can reduce the other types of waste and enhance their overall performance.

Examples

- When employees are not effectively engaged in the process.
- When the right person is not available at the right place.
- When the person performing the work is overqualified.

Improvement Ideas

- Make the most of brainstorming and other idea gathering techniques.
- Implement an idea system and encourage employees to make improvement suggestions.
- Ensure that the ideas and suggestions are well heard.
- Show respect and confidence for all by letting them solve their daily problems as owners.

Self-check questions 4

1. What is Muda, and why is it crucial in both manufacturing and service sectors?
2. Provide examples of overproduction waste in both manufacturing and service industries, and discuss its negative impacts.
3. How does excess inventory affect both manufacturing and service processes, and what strategies can be employed to minimize it?
4. Define transportation waste in the context of both manufacturing and service, and suggest practical approaches to mitigate it.
5. Explain waiting-time waste and its implications in both manufacturing and service operations, along with methods for effective reduction.

2.3 Understanding Waste in the Workplace

2.3.1 Value-added vs. non-value-added activities:

- Value-added activities: These are activities that directly contribute to meeting customer needs and requirements. They enhance the quality, functionality, or features of the final product or service and are perceived as valuable by the customer.
- Non-value-added activities: Non-value-added activities are those that do not contribute to meeting customer needs and requirements. They include tasks, processes, or steps that add no value to the final product or service and are considered wasteful. Identifying and eliminating non-value-added activities is essential for improving efficiency and reducing costs in the workplace.

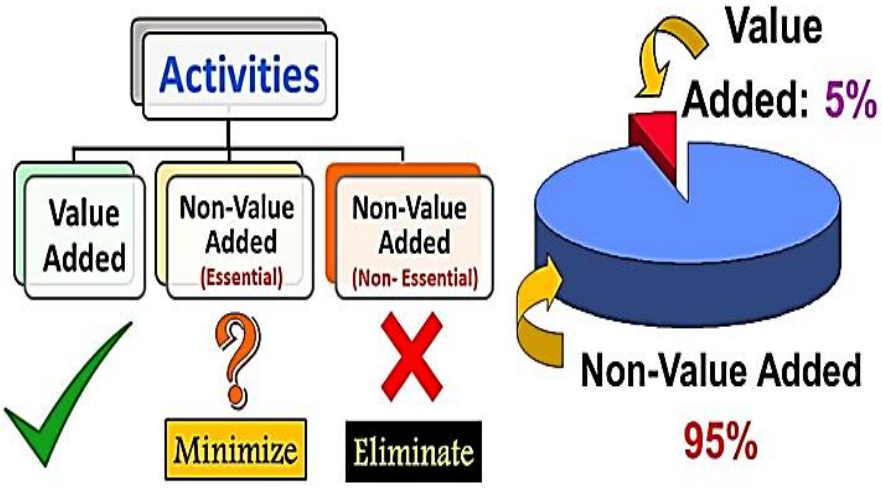


Figure 2.9. value adding vs non-value adding activities

2.3.2 Sources and Effects of Waste in Production Processes:

Sources of waste:

- Waste in production processes can arise from various sources, including overproduction, waiting times, transportation inefficiencies, unnecessary motion, over processing, excess inventory, and defects or errors in products or services. Eliminating these sources of Muda is the primary goal of lean manufacturing to improve efficiency, quality and productivity.

- The 5M+S framework is a useful tool for identifying sources of Muda (waste) in production processes.

The 5M stands for:

- **Man (People)** - Untrained workers performing unnecessary motions, lack of skills, poor ergonomics
- **Machine** - Outdated equipment causing frequent breakdowns and defects
- **Material** - Excess inventory of obsolete parts, poor quality materials
- **Method** - Unclear work instructions leading to over processing, inefficient processes
- **Measurement** - Lack of process control data to detect defects early/The +S represents:
- **Surroundings** - Poor layout, lighting, noise, temperature causing worker fatigue and errors

Effects of waste: Waste negatively impacts productivity, efficiency, and profitability in the workplace. The effects of Muda, or waste, in production processes can be detrimental to organizations in various ways:

- **Increased Costs**: Waste leads to unnecessary consumption of resources such as materials, labor, energy, and time. This results in higher production costs, reducing profitability and competitiveness.
- **Reduced Productivity:** Waste creates inefficiencies in production workflows, leading to delays, bottlenecks, and idle time. This reduces the overall productivity of the organization and limits its capacity to meet customer demand.
- **Poor Quality:** Muda often leads to defects, errors, and rework in the production process. This results in lower product quality, increased customer complaints, and higher costs associated with warranty claims and returns.
- **Excess Inventory:** Overproduction and inefficient inventory management practices result in excess inventory levels. This ties up capital, occupies valuable storage space, and increases the risk of obsolescence or spoilage.
- **Long Lead Times:** Waste such as waiting, transportation delays, and inefficient processes contribute to longer lead times for delivering products to customers. This reduces responsiveness to customer needs and increases the risk of losing business to competitors.

- **Employee Frustration:** Waste in the form of inefficient processes, poor communication, and underutilization of talent can lead to frustration and disengagement among employees. This affects morale, job satisfaction, and retention rates.
- **Environmental Impact:** Some forms of waste, such as excessive energy consumption, pollution, and waste generation, have negative environmental consequences. This can harm the organization's reputation, lead to regulatory compliance issues, and incur additional costs for environmental remediation.
- **Loss of Competitive Advantage:** Organizations that fail to address waste effectively risk losing their competitive advantage in the market. Competitors who can produce higher quality products more efficiently are likely to capture market share and outperform them.

2.3.3 Visual Management Tools for Waste Identification:

Visual management is a business management approach that communicates important information in a visual and real-time manner. It is a system of labels, signs, markings, information displays, and visual guides instead of written instructions. Kaizen organizations rely significantly on visual management to detect abnormalities, reinforce standards, and ensure stability and safety are maintained in the workplace. Visual management is particularly important during the early phase of Lean implementation.

Figure 2.10. Visual Board

A good illustration that demonstrates the power of visual management is found in road signs, traffic lights, and lane markers on the road. The messages they convey are so clear that when you see a traffic light for example, you know exactly what you should be doing. Research has consistently demonstrated that people tend to learn and process information more effectively when presented visually. Our brains inherently respond with greater speed and accuracy to colors, shapes, patterns, graphics, and pictures. Just as road signs are easier to understand than written signs, workplace visuals are easier to understand than written instructions. Therefore, incorporating effective workplace visuals can yield positive impacts on safety, productivity, quality, and on-time delivery.

Visual management includes a wide range of visual controls that help making all workplace elements and processes more visually apparent. These visual controls can be:

- Informative to show identity, directions, strategic goals, customer expectations and compliance requirements.
- Instructional to communicate SOPs, work-related information, and workplace organization and maintenance activities.
- Result-oriented to display the status of processes, projects, production, productivity and performance.

Many techniques and principles rely on visual management

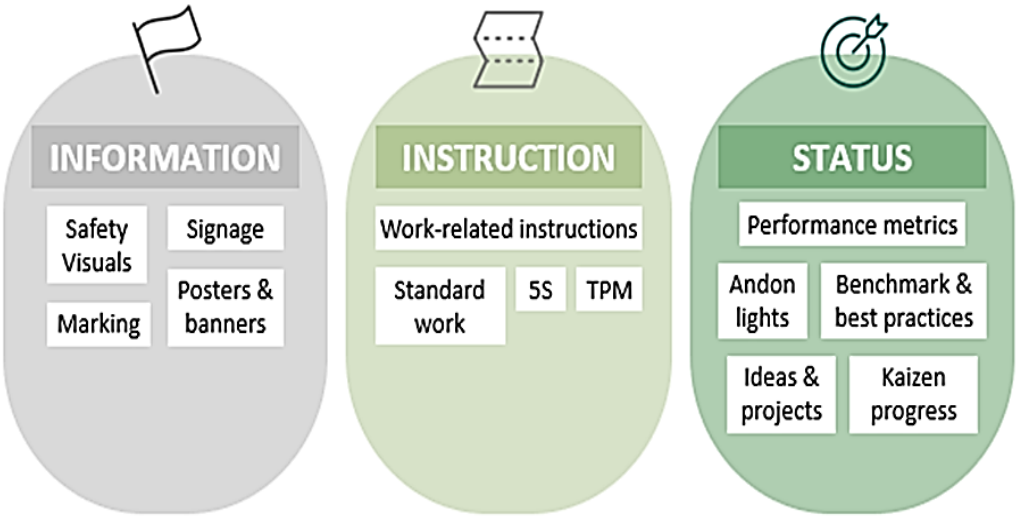


Figure 2.11. Visual Management techniques

Kaizen board

Kaizen board is a bulletin board set up at a workplace or in a publicly accessible place in the factory or the company in order to disseminate information about the Kaizen activities at the workplace and the company. Information put up on the board includes various Kaizen- related news and announcements, either company-wide one or particular workplace related.

It is a means of management -employee communication. Information sharing in this manner helps foster employees' sense of participation, recognition and motivation in Kaizen activities.

Every working team has to prepare and use a Kaizen board. This encourages for the teams to work “as independent as possible” and transforms their ideas to improvements. As long as every team uses a Kaizen board, it becomes also easy for the management to be informed at any time, just by walking around and checking the information on the board. In general, a Kaizen board is important for:

- Continuous Kaizen activity in a company or organization.
- Participation of all employees during Kaizen activity through Suggestion system.
- Employees including management to know about Kaizen performance in their work area or organization.
- Employees and management to know about production plans and performance.

The size of a Kaizen board should be 2 times a flip chart paper. It has four corners or parts depending on the information displayed.

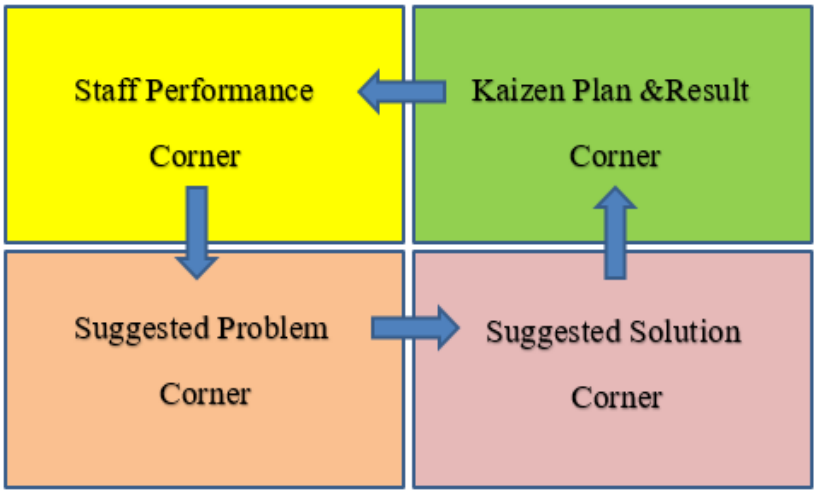


Figure 2.12. Kaizen Board

- The "**staff performance corner**" shows the actual performance of the staff and the gabs and training needs. The staff performance can be shown on the Kaizen board using different colors such as red for low performer, blue for average performer, and green for best performer.
- The "**Kaizen plans & results corner**" shows the results generated from implementing Kaizen activities. Improvement graphs can be displayed and should be updated regularly at least on weekly basis. If the results are below the planned target, the team has to discuss and find the root cause and implement solution
- The "**suggested problems corner**" is the place where every team member's ideas or identified problems are posted. The posted problems have to be discussed and solved by the teams and the solutions should be displayed on the next corner i.e. "suggested solutions corner".
- The "**suggested solutions corner**" displays the solutions suggested for known problems. And the solution ideas have to be implemented and the results achieved have to be shown on the "Kaizen results corner".

2.4 Identifying and Eliminating Muda

2.4.1 Gemba Walks and Observation Techniques:

Gemba walks involve going to the actual workplace, observing operations, and engaging with employees to understand work processes, identify inefficiencies, and uncover sources of waste. By being on the "gemba" (the actual place where work is done), managers and leaders gain valuable insights into waste and opportunities for improvement.

Figure 2.13. Gemba Walks and Observation Techniques

Gemba walks are a powerful tool for understanding and improving processes by directly observing the actual work being done. Here are some key techniques for conducting effective Gemba walks and observations:

Prepare for the Walk

- Define a clear purpose and scope for the walk
- Prepare questions, checklists, and tools to guide the observation
- Inform the team ahead of time to put them at ease

Observe and Engage

- Start at the end of the process and work backwards
- Observe the process as a whole, not just individual steps
- Look for value-added vs non-value-added activities, wastes, and inefficiencies
- Trace the flow of materials, information, and people
- Compare the actual process to the standard process
- Interview employees with open-ended questions to gain their perspective
- Avoid disrupting the process or providing solutions on the spot

Document Findings

- Record observations, ideas, and findings
- Take photos or videos to document the process
- Avoid preconceived notions and keep an open mind

Follow Up

- Discuss learnings with the team and determine improvement opportunities
- Implement changes and return to the Gemba to verify results
- Regularly conduct Gemba walks as part of continuous improvement

The key is to go to the actual place of work, observe the process, engage employees, and identify opportunities to streamline operations and eliminate waste. Proper preparation, an open mindset, and follow-through are essential for Gemba walks to be effective.

2.4.2 Root Cause Analysis for Waste:

Root Cause Analysis (RCA) is a systematic method used to identify and address the underlying causes of problems or waste in a process. The goal of RCA is to eliminate the root cause of the problem, rather than just treating its symptoms. Here's a step-by-step guide to conducting a Root Cause Analysis for waste identification and elimination:

Figure 2.14.: Root cause vs symptom

Step 1: Define the Problem

- Identify the specific problem or waste that needs to be addressed.
- Clearly define the problem statement, including the scope, impact, and any relevant metrics.

Step 2: Gather Data

- Collect relevant data and information related to the problem.
- Review documents, records, and reports to understand the process and identify potential causes.
- Conduct interviews with stakeholders, including employees, customers, and suppliers.

Step 3: Identify Potential Causes

- Brainstorm potential causes of the problem using tools such as:
    - Fishbone diagrams (Ishikawa diagrams)
    - Cause-and-effect diagrams
    - Pareto charts
    - Flowcharts
- Identify potential causes based on the data and information gathered.

Step 4: Analyze Causes

- Evaluate each potential cause using tools such as:
    - Failure Mode and Effects Analysis (FMEA)
    - Fault Tree Analysis (FTA)
    - Systemic Failure Analysis
- Identify the most likely cause of the problem.

Step 5: Identify Root Causes

- Use the analysis results to identify the root cause of the problem.
- A root cause is defined as the underlying cause that has led to the problem, rather than a symptom or immediate cause.
- Ensure that the root cause is specific, measurable, achievable, relevant, and time-bound (SMART).

Step 6: Develop Action Plan

- Based on the identified root cause, develop an action plan to address it.
- Identify specific steps to eliminate or mitigate the root cause.
- Assign responsibilities and establish timelines for implementation.

Step 7: Implement and Monitor

- Implement the action plan and monitor its effectiveness.
- Track progress and adjust the plan as needed.
- Continuously evaluate and improve the process.

2.5 Continuous Improvement Mindset in Waste Reduction:

Adopting a continuous improvement mindset is essential for sustaining waste reduction efforts over time. The concept of a continuous improvement mindset in waste reduction emphasizes the ongoing effort to identify, address, and eliminate waste within an organization. It involves fostering a culture of innovation, learning, and proactive problem-solving where employees at all levels are engaged in seeking opportunities for improvement. Here's how this mindset contributes to waste reduction:

Proactive Identification of Waste: Employees are encouraged to continuously observe and analyze processes to identify sources of waste. By being proactive in waste identification, organizations can address inefficiencies before they escalate and negatively impact productivity and quality.

Empowerment and Involvement: Cultivating a continuous improvement mindset empowers employees to take ownership of waste reduction initiatives. When employees feel empowered and involved in the decision-making process, they are more likely to actively participate in waste reduction efforts and contribute innovative solutions.

Iterative Problem-Solving: Embracing a continuous improvement mindset involves adopting an iterative approach to problem-solving. Instead of viewing waste reduction as a one-time effort, organizations continuously seek opportunities for improvement, implement solutions, evaluate outcomes, and make further refinements.

Learning Culture: Organizations with a continuous improvement mindset prioritize learning and knowledge sharing. They encourage employees to experiment with new ideas, learn from both successes and failures, and share best practices across teams and departments. This culture of learning fosters creativity, innovation, and continuous improvement.

Data-Driven Decision-Making: A continuous improvement mindset emphasizes the importance of data-driven decision-making in waste reduction efforts. By collecting and analyzing data

related to process performance, organizations can identify trends, root causes of waste, and opportunities for improvement, enabling more informed decision-making.

Leadership Support and Alignment: Leadership plays a crucial role in fostering a continuous improvement mindset. Leaders should actively support and promote waste reduction initiatives, allocate resources, and provide guidance to ensure alignment with organizational goals and objectives.

Sustained Focus on Improvement: Finally, a continuous improvement mindset ensures that waste reduction efforts remain a priority over time. Organizations regularly revisit and review their waste reduction strategies, adapt to changing circumstances, and continuously strive for excellence in all aspects of operations.

Unit Summary

The concept of "Muda" or waste is a fundamental principle in the philosophy of Kaizen, a continuous improvement approach.

Muda refers to any activity or process that does not add value to the final product or service from the customer's perspective.

This can include unnecessary steps, redundant processes, and inefficient use of resources. Identifying and eliminating waste is crucial for improving efficiency, reducing costs, and enhancing overall quality.

There are eight types of waste that can be identified in the workplace, including overproduction, excess inventory, transportation waste, motion waste, waiting-time waste, over processing, defects, and unused human skills. Overproduction occurs when more products or services are produced than what is needed by the customer, while excess inventory refers to having more materials or information than what is needed. Transportation waste involves moving materials or products unnecessarily, while motion waste refers to unnecessary movement performed by individuals. Waiting-time waste occurs when employees are idle due to delays or inefficiencies, while over processing involves doing more processing than what is valued by the customer. Defects waste refers to errors or defects in products or services, while unused human skills refer to failing to utilize the skills and creativity of employees.

By identifying and eliminating these types of waste, organizations can achieve significant improvements in efficiency and productivity. For example, eliminating overproduction can reduce inventory costs and improve cash flow, while reducing motion waste can improve employee safety and reduce ergonomic hazards. By adopting a culture of continuous improvement and eliminating waste, organizations can achieve sustainable growth and competitiveness, and deliver high-quality products and services to their customers.

Unit Review Questions

Part I: Answer the following questions

1. Unnecessary Motion is any movement of people that does not add _____to the product.
   A. Cycle Time
   B. Value
   C. Defects
   D. Muda
2. Reaching or straining to reach a tool is an example of what type of waste?
   A. Motion
   B. Processing
   C. Transportation
   D. Inventory
3. The primary difference between the wastes of motion and transportation is that with transportation we are moving goods or inventory and with motion people are moving without goods or inventory.
   A. True B. False
4. Defects are caused by ----------
   A. Inadequate training
   B. Skill shortage
   C. Operator error
   D. all

5. Waste of correction includes additional work performed on product or service
   A. True B. False
6. Which one is over processing waste?
   A. Idle equipment
   B. Painting unseen areas
   C. Excessive movement of worker
   D. Poor lay out

Part II: Matching

A	**B**
1. Producing ahead of what's actually needed	A. Motion
2. More materials or information than is required	B. Inventory
3. Unnecessary movement of people and equipment	C. Defect
4. Idle time waits	D. Over production
5. Unnecessary steps in the production process	E. Transportation
6. Rework and scrap due to poor quality	F. Waiting
7. Moving things; shipping, conveyors (Materials, equipment, people)	G. Process

Project Work

- Look around your school, among the seven type of waste which types of wastes are noticeable in your school compound.
  1. What do you think the causes of waste?
  2. What do you suggest to control these wastes?

UNIT 3

5s procedure

3.1 Meaning of 5S

The 5S methodology is an improvement tool for organizing and maintaining a disciplined and productive workplace. It facilitates the creation of a better working environment by reducing waste while improving efficiency, safety and quality. 5S represents five fundamental practices that starts with the letter 'S'. It is commonly applied by manufacturing facilities in production lines, storage areas, maintenance areas, and offices. It is now being increasingly applied across diverse industries including health care, logistics, hospitality and construction.

Rooted in Japanese management principles, 5S was originally developed by Toyota as an integral component of their Lean production system. It is considered an important component of Lean Thinking and a prerequisite for driving other Lean techniques such as TPM and flow optimization. Many companies start their Lean transformation journey with 5S because it is one of the easiest Lean techniques and exposes some of the most visible examples of waste. Many experts believe that you need to be successful with 5S so you don't struggle with the other techniques during Lean implementation.

Learning outcomes:

At the end of this unit, students will be able to:

- Understand basic concepts of 5s procedures
- Perform 5S activities
- Promote and maintain 5s culture

Key terms: 5s, Red gate,

Details of 5S approach

5S: **S**ort- **S**et- **S**hine- **S**tandardize- **S**ustain

Figure 3.1. Five **S**

Table 3.1. The 5Ss are: listed by Japanese, English and Amharic language

Japanese	English	Amharic	
Seiri	Sort	ማጣራት	The first step in 5S is to eliminate all the things in the workspace that are not being used and store them away. If a tool are material is not used on a daily basis, eliminate it from the workstation.
Seiton	Set in Order	ማስቀመጥ	The second step is to arrange the items used on a daily basis so that they can be easily accessed and quickly stored. Your goal is to make eliminate any unnecessary movements and actions by the worker to make his process as efficient as possible.
Seiso	Shine	ማፅዳት	Next is to get everything cleaned and functioning properly. The goal is to remove all the dirt and the grime and to keep it that way on daily basis. You want to get it clean and keep it clean.
Seiketsu	Standardize	ማላመድ	The fourth step is to develop a routine for sorting, setting and shining. Standardize creates a system of tasks and procedures that will ensure that the principles of 5S are performed on a daily basis
Shitsuke	Sustain	ማስቀጠል	In the last step, you want to create a culture that will follow the steps on a daily basis. The chief objective of sustain is to give your staff the commitment and motivation to follow each step, day in and day out.

2.6 Benefit of Implementing 5S

- Improves safety and ergonomics
- Promotes flow
- Reduces searching
- Reduces unplanned downtime
- Improve quality
- Enhances teamwork
- Tackles waste
- Improves productivity
- Eliminates distractions
- Reduces inventory and space
- Instills the discipline to follow standard work
- Encourages visual control
- Exposes problems
- Enhances self-management

3.3 Relationship between 5S and Kaizen philosophy

The relationship between 5S and Kaizen philosophy is fundamental in driving continuous improvement and organizational excellence. 5S and Kaizen are closely intertwined concepts that complement each other in the pursuit of efficiency, quality, and waste reduction within an organization.

Relationship between 5S and Kaizen:

a) **Foundation for Continuous Improvement:** 5S, a methodology focused on workplace organization and efficiency, lays the groundwork for improvement by creating a clean, organized, and safe work environment. Kaizen, on the other hand, is a philosophy of continuous improvement that emphasizes making small, incremental changes over time. Together, 5S provides the foundation for Kaizen to thrive by establishing an ideal workplace environment conducive to continuous improvement

b) **Sustaining Improvement Gains:** 5S helps sustain the gains achieved through continuous improvement efforts by ensuring that the workplace remains organized, efficient, and conducive to ongoing enhancements. As employees engage in Kaizen activities to improve

processes and products, the principles of 5S ensure that the workplace organization is maintained even as changes are implemented, thus supporting the sustainability of improvements over time.

c) **Cultural Impact:** Both 5S and Kaizen foster a culture of continuous improvement within an organization. While 5S encourages employees to constantly seek ways to enhance workplace organization, Kaizen motivates them to identify opportunities for process and product improvements. Together, these philosophies instill a culture of continuous learning, innovation, and efficiency throughout the organization, driving sustained growth and development

In essence, the relationship between 5S and Kaizen is symbiotic, with 5S providing the groundwork for continuous improvement initiatives driven by the principles of Kaizen. By integrating these methodologies, organizations can create a culture of excellence, efficiency, and innovation that leads to sustained improvements and operational excellence

Self-check questions 5

1. What is the 5S methodology, and how does it improve workplace efficiency?
2. Describe each of the five steps of 5S and their practical applications.
3. What are the key benefits of implementing 5S in an organization?
4. How does 5S relate to the concept of continuous improvement?

Explain the symbiotic relationship between 5S and the Kaizen philosophy

3.4 The 5S Phases

The term 5S is an abbreviation for five Japanese words: **seiri**, **seiton**, **seisou**, **seiketsu**, and **shitsuke**. These five words are often translated into English as: **sorting**, **setting in order**, **shining**, **standardizing**, and **sustaining.**

Figure 3.2.the 5s phases

3.4.1 Sort/seiri

This phase refers to the practice of going through all the items within the workplace and keeping only what is actually needed. Items which are excess to requirements should either be stored offsite, sold, scraped, or discarded. The main idea behind this phase is to clear the area from distractions to concentrate on what remains in the workplace. This leads to less clutter and wasted time, frees up valuable space, and creates a more streamlined workplace.

Definition of Sort

Sort, the first pillar of 5S, means classifying items in the workplace in to two categories – necessary and unnecessary - and removing all the unnecessary items that are not needed for current operations. It corresponds to the Just In Time (JIT) principle of "only what is needed, only in the amount needed, and only when it is needed." The workplace is full of unused machines, jigs, dies, rejects, work-in-process, raw materials, supplies, parts, shelves, containers, desks, workbenches, files, carts, racks, pallets and other items. People tend to hang onto parts, thinking that they may be needed for the next time. They see an inappropriate machine or equipment and think that they will use it somehow. In this way, inventory and equipment tend to accumulate and get in the way of everyday activities. This leads to a massive build of waste in companywide or in the whole workshop. An easy rule is to remove anything that will not be used within the next 30 days. A ceiling on the number of necessary items should be established. Red-tag holding area can also help to evaluate the need of an item instead of simply getting rid of it. This greatly reduces the risk of disposing of an item that is needed later that will be explained in detail in the next contents.

Benefits of sort activity

Implementing this first pillar creates a work environment in which space, time, money, energy, and other resources can be managed and used most effectively. Sorting can lead to a much safer workplace. By clearing out the items you no longer need, people will have more room to work and things like trip hazards and items falling off shelves will be greatly reduced. Sorting also improves work flow since there is less clutter to deal with and will most definitely increase productivity in both production and office environments. Problems and annoyances in the work flow are reduced, communication between workers is improved, and product quality

is increased, and productivity is enhanced. If the first pillar is not well implemented, the following types of problems occur:

1. The factory or a workshop becomes increasingly crowded and hard to work in.
2. Unnecessary lockers, shelves, cabinets and items make communication between employees difficult.
3. Time is wasted in searching for parts and tools.
4. Increase unnecessary maintenance cost of unneeded inventory and machinery.
5. Excess stock-on-hand hides other types of problems in production.
6. Unneeded items and equipment make it harder to improve the process flow

Before **After**

Figure 3.3.sorting activity

Implementing sort activity:

It is not always easy to identify unneeded items in a factory or workshop. Workers seldom know how to separate items needed for current production from unnecessary items. The following procedures will help in implementing sort activity.

Sorting is a step that involves selecting what you need to complete the job and removing everything else from your work area.

- Focuses on eliminating unnecessary items from the workplace
- Categorize equipment, furniture, tool in your working place into the following 3 categories

1. Necessary 48
2. Unnecessary
3. May not necessary\

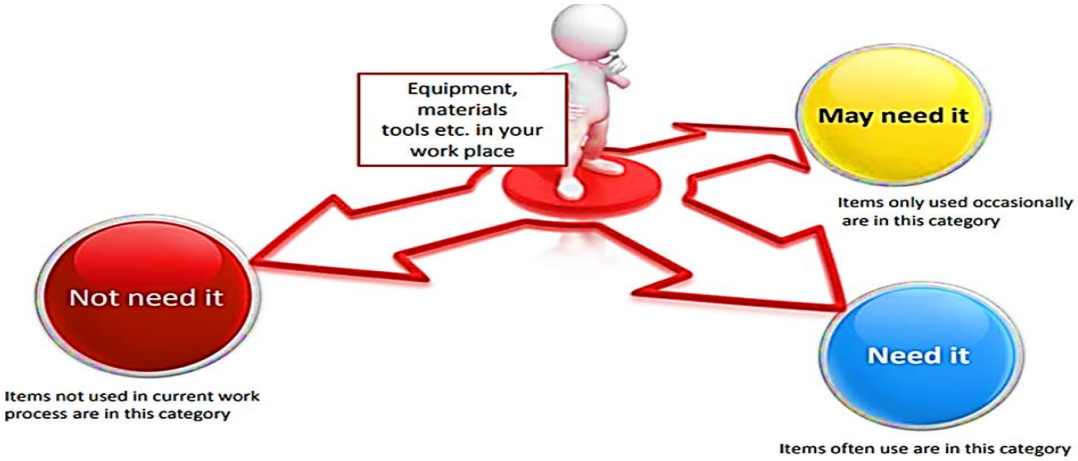


Figure 3.4. Identifying necessary vs necessary items

Overview of red tagging

The Red-Tag Strategy is a simple method for identifying potentially unneeded items in the factory or workshop, evaluating their usefulness and dealing with them appropriately. Red tagging means putting red tags on items in the factory or workshop that need to be evaluated as being necessary or unnecessary. A Red tag is a red colored tag used to identify items no longer needed in a particular work area.

The red tags catch people's attention because red is a color that stands out. An item with a red tag is asking three questions:

- Is this item needed?
- If it is needed, is it needed in this quantity?
- If it is needed, does it need to be located here?

Once these items are identified, they can be held in a "Red Tag Holding Area" for a period of time to see whether they are needed, disposed of, relocated, or left exactly where they are

Figure 3.5 Red Tag Holding Area.

Steps/procedures in Red tagging

The red-tagging process in a department or work area can be broken down into seven steps.

- Step 1: Launch the red-tag project.
- Step 2: Identify the red-tag targets.
- Step 3: Set red-tag criteria.
- Step 4: Make red tags.
- Step 5: Attach red tags.
- Step 6: Evaluate red-tagged items.
- Step 7: Document the results of red-tagging.

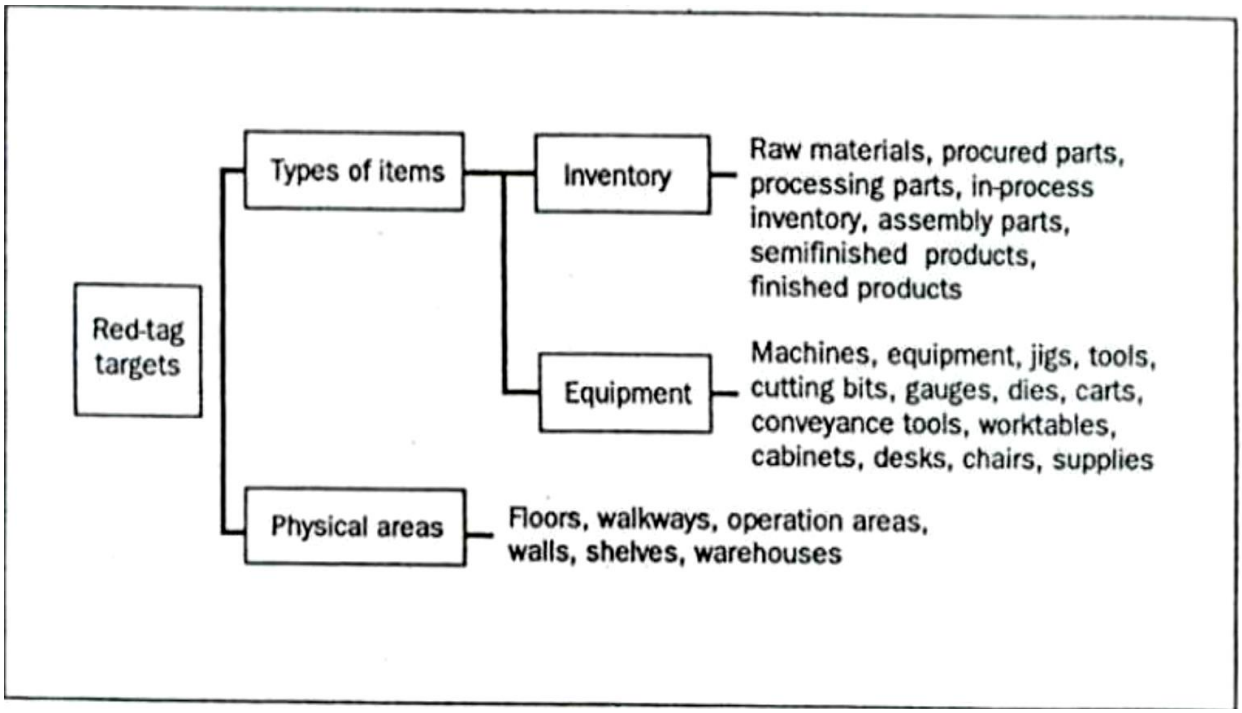


Figure 3.6. Red tag flow

. **Identifying Necessary Vs. Unnecessary Items:**

- This step involves assessing all items within a work area to distinguish between those that are necessary for current operations and those that are unnecessary or redundant. Employees are encouraged to critically evaluate each item based on its usefulness, frequency of use, and contribution to workflow efficiency. Necessary items are those that directly support daily tasks, promote safety, or align with organizational objectives. Unnecessary items include obsolete tools, expired materials, excess inventory, and items that have accumulated over time but are no longer needed for day-to-day operations. The goal is to streamline the work area by removing unnecessary items, reducing clutter, and creating a more organized and efficient workspace

Types of unnecessary items

Some of types of unnecessary items are:

- Defective or excess unneeded items that accumulate
- Outdated or broken jigs and dies
- Worn-out bits, inserts
- Outdated or broken tools or inspection equipment
- Old rags and other cleaning supplies 52
- Electrical tools/equipment with broken cords
- Outdated posters, signs, notices, and memos
- Place “Red tag” for categorization of items to identify unnecessary items
- Move unnecessary items(broken tools, obsolete jigs and fixtures, scrap and excess raw material etc.) to central stored area
- Free up valuable floor space (Space utilization)

3.4.2 Set in Order/ seiton:

Definition of set in order

Set in order means arranging necessary items so that they are easy to use and labelling them so that anyone can find them and put them away. The key word in this definition is “anyone”. Set in order can be implemented only when the first pillar- sort is done first.

No matter how well you arrange items, set in order can have little impact if many of the items are unnecessary and not sorted. Similarly, if sorting is implemented without setting in order, it is much less effective. Where necessary items should be placed should be made clear for anyone to immediately find them and return them easily. Hence, Sort and Set in order work best, when they are implemented together.

To effectively implement the 5S methodology, the Set in Order phase follows the completion of the Sort phase, ensuring that unnecessary clutter is eliminated before organization begins. Set in Order aims to establish a standardized and consistent system for storing and retrieving tools and materials. This involves arranging items in a manner that optimizes accessibility and efficiency. The user must devise this system based on the frequency of use and the associated processes. Setting in order involves organizing items in a logical manner, ensuring they are

easily found and identifiable. Once unnecessary items are removed, the remaining ones are arranged to facilitate easy access and immediate recognition of their proper place.

This strategic organization minimizes wasted time and motion, streamlines workflow processes, and enhances overall efficiency within the workspace.

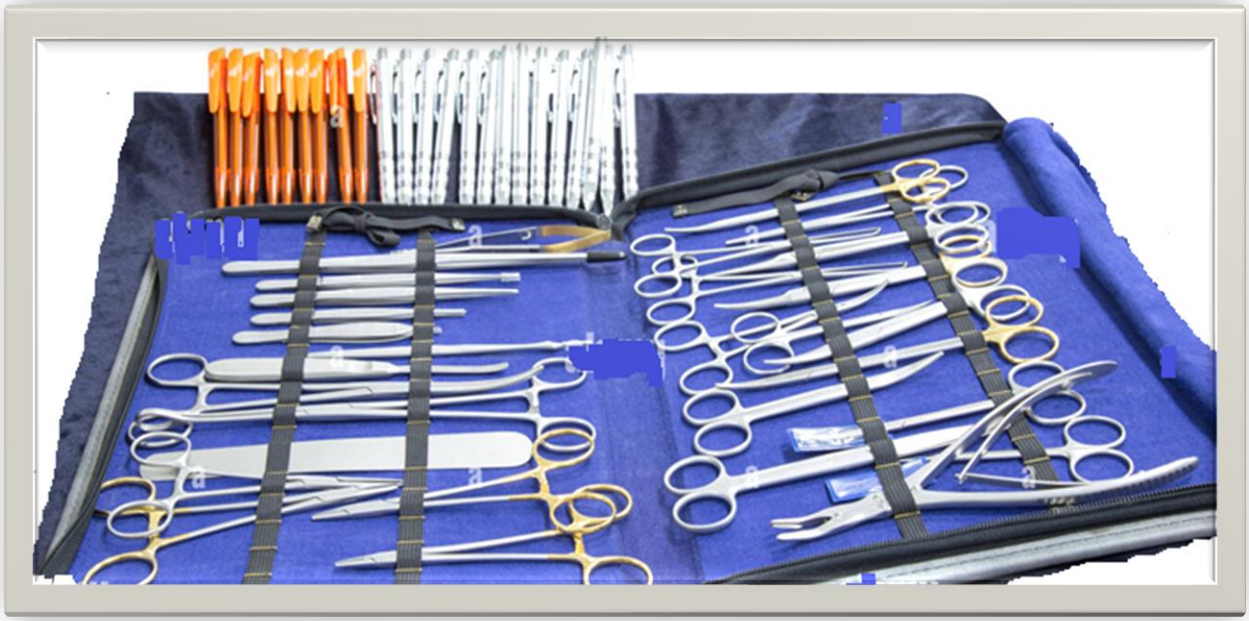


Figure 3.7.Set in order example

Implementing set in order activity

In implementing set in order pillar, we use visual controls so that communications became easy and smooth. For example, we can visually know where items are placed and where to return them and so on. A visual control is any communication device used in the workplace that tells us at a glance how work should be done. Through visual controls, information such as where items belong, how many items should be placed there, what the standard procedure is for doing something, the status of work in process etc can be communicated.

Procedures for Set in order

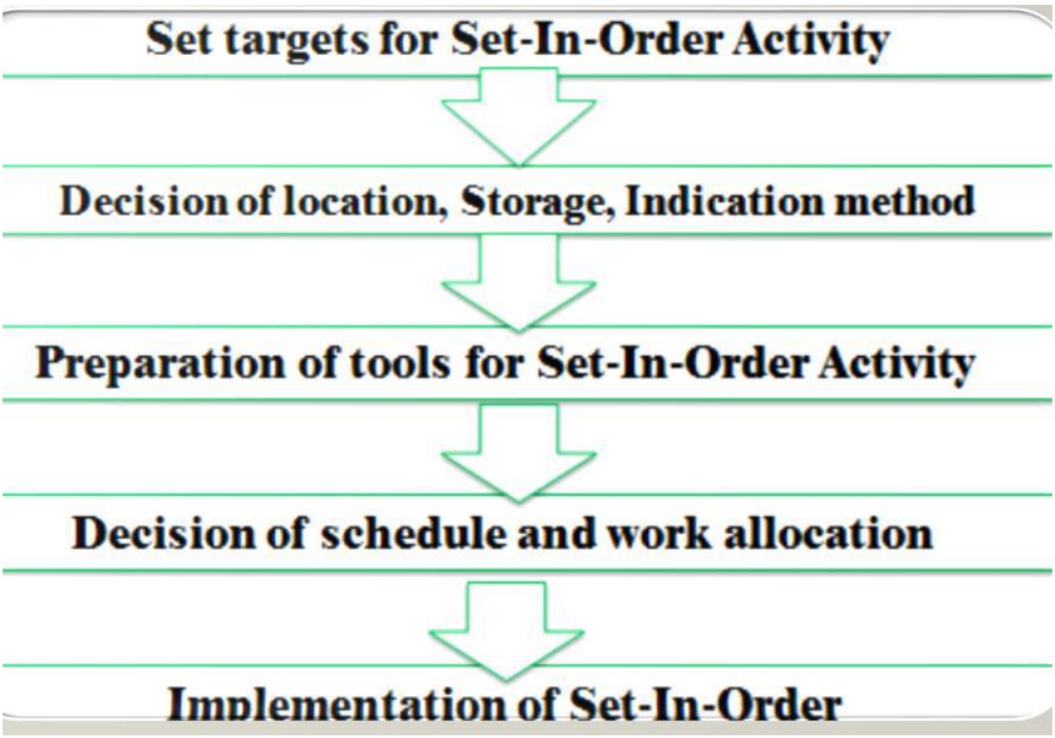


Figure 3.8. Set in order example

There are some principles for deciding best locations for tools and equipment. Jigs, tools and dies differ from materials, equipment, machinery and parts in that they must be put back after each use. Some of the principles for jigs, tools and dies also apply to parts, equipment, and machinery. These are:

- Locate items in the workplace according to their frequency of use. Place frequently used items near the place of use. Store infrequently used items away from the place of use.
- Store items together if they are used together, and store them in sequence in which they are used.
- Make storage places larger than the items stored there so that they are physically easy to remove and put back.
- Store tools according to function or product. Function-based storage means storing tools together when they have similar functions. This works best for job-shop production. Product-based storage means storing tools together when they are used on the same product. This works best for repetitive production

Some guidelines to consider:

- If items are used together, store them together.
- Put frequently used items closest to the user.
- Place items so the user doesn't need to bend or twist much to access them.
- Arrange tools and materials in order of use.
- Identify the best location for each essential item
- Place each essential item in its assigned location
- After use immediately return each essential item to its assigned location
- Regularly check that each essential item is in its assigned location
- The Set in Order step utilizes several strategies to accomplish its goals

Three Rules for Storage Space

- Get rid of all unnecessary items
- Decide proper storage layout/classification
- Standardize names

Table.3.9. Priority frequency of use

Priority	**Frequency of use**	
Low	Once a year	Throw away Store in distant place
Average	Once every 2-6 months Once a month Once a week	Store together Somewhere in the office
High	Once a day Once an hour	Carry or keep at your workplace

Example of “Setting” activities

- Labeling, numbering, zoning for clear identification of storage areas to keep necessary items
- Set necessary items matching with workflow to minimize unnecessary movement and transportation time

Labels and Signs

A key component of any organizational program, labeling is the easiest way to quickly and visually identify proper placement of tools, materials, and equipment. For example, drawers of tool chests can be labeled with their contents so employees can easily find what they need. The floor can even be labeled indicating where trash cans, machinery, and other equipment should be placed so these things always find their way back to where they belong.

Figure 3.10.Labels and Signs

once everything is properly labeled; it's easier for employees to keep 5S in focus on a daily basis. If they ever forget the location of something, the answer is right in front of them.

Line Marking

Painted or taped lines are often associated with safety (pedestrian paths, forklift and equipment paths, etc.), but they are also very useful for marking work areas, as well as locations for pallets, raw materials, finished goods, shipping, and other static locations. By marking the boundaries of these areas, you'll make it easier for employees and visitors to make sense of space.

Figure 3.11.Line Marking

These techniques can be used for work cells of any kind. They will improve workflow and result in improved productivity. Additionally, misplaced items and equipment are easy to spot.

Tool/shadow board

Tool outlining means creating a visual outline of your tool so you can quickly return it to its proper home. For pegboards and other hanging tool systems, this is done by placing painted or vinyl cutouts of your tools behind those tools. Vinyl tool outlines work well since they are easy to apply and require no maintenance.

This method is called shadow boarding. These methods of organizing tools are simple but effective. They make organization more visual.

Figure 3.12. Tool outlining

Workplace layout optimization:

- **Flow Analysis:** Analyze the flow of work within the workspace to identify inefficiencies or bottlenecks. Observe how materials and workers move through the space and look for opportunities to streamline processes.
- **Zone Segregation**: Divide the workspace into zones based on the type of work being performed or the frequency of use. This allows for better organization and prevents congestion by keeping similar activities grouped together.
- **Ergonomic Considerations:** Design workstations and layouts with ergonomics in mind to minimize strain and fatigue on workers. Ensure that tools and materials are easily accessible without requiring excessive reaching or bending.
- **Flexibility and Adaptability**: Create layouts that can be easily adjusted or reconfigured to accommodate changes in workflow or production requirements. This may involve using modular furniture or mobile workstations that can be rearranged as needed.
- **Safety Compliance:** Ensure that the layout adheres to safety regulations and guidelines, with clear pathways for movement and adequate space around machinery and equipment. Regularly review and update the layout to address any new safety concerns or hazards.

Some of the strategies used in this phase are

- Assign positions for all equipment, tools, parts and materials.
- Store items by frequency of use and at the point of use.
- Organize normal items in modular cabinets, drawers, shelves and racks.
- Organize small items into storage bins, boxes and cans.
- Organize large items in standard well-labeled floor or outside areas.
- Change to an open storage system. Eliminate locks and covers as they hide secret inventory and lost parts and tools.
- Improve wiring organization.
- Place shared tools on shadow boards.
- Use different colored paint or tape to assign tools for different departments or individuals.

- Use functional carts when conducting changeovers, maintenance or cleaning.
- Ensure safety equipment is easily accessible.
- Keep clear standardized labels on work areas, doors, shelves, boxes, bins and hangars.
- Use tape or paint to mark and label floors, isles, storage areas, parking areas, delivery areas, staking areas, and the locations of safety equipment. Stack pallets correctly and ensure FIFO is being followed.
- Use colors and labels to define inventory levels and reorder triggers. Use a tool checklist to ensure all the proper tools are available.

Before **After**

Before **After**

Figure 3.13 work place lay out optimization

3.4.3 Shine/ Seiso

The shine step of 5S is a crucial part of the 5S methodology that focuses on cleanliness and organization. The objective of the shine step is to thoroughly clean and remove any dirt, dust, or debris from the work area, equipment, and tools. By maintaining a clean and organized workspace, it helps to improve safety, efficiency, and productivity.

The shine step involves tasks such as sweeping, mopping, dusting, and wiping down surfaces. It also includes regular maintenance and inspection of equipment to ensure they are in good working condition. Regular cleaning helps to prevent equipment breakdowns, reduce errors, and improve overall work quality.

Overall, the shine step of 5S helps to create a clean and organized work environment that promotes employee morale and productivity.

Figure 3.14. Shining example and tools

Cleaning and Maintenance Standards:

- **Establish Clear Standards**: Define the level of cleanliness expected in different areas (e.g., workstations, common areas, restrooms) according to industry regulations and company policies.
- **Documentation**: Maintain written guidelines outlining specific cleaning procedures, including the frequency of tasks and the products/tools to be used.
- **Training**: Train staff on proper cleaning techniques, safety protocols, and the importance of maintaining hygiene standards.

- **Inspection and Audits**: Regularly inspect premises to ensure compliance with cleaning standards. Conduct periodic audits to identify areas for improvement.
- **Adaptability**: Remain flexible to adjust cleaning protocols based on changing needs, such as during peak hours or in response to special events.
- **Daily Cleaning Routines and Responsibilities:**
- **Assigned Tasks**: Clearly define daily cleaning tasks for each staff member or team, including responsibilities for specific areas or equipment.
- **Schedule**: Develop a cleaning schedule that ensures all necessary tasks are completed each day without disrupting workflow.
- **Checklists**: Provide employees with detailed checklists outlining tasks to be performed, with checkboxes for verification.
- **Supervision**: Assign a supervisor or team leader to oversee cleaning activities and ensure tasks are completed to standard.
- **Feedback Mechanism**: Encourage staff to report any maintenance issues or cleaning deficiencies promptly, allowing for swift resolution.
- **Creating a Safe and Pleasant Work Environment:**
- **Safety Protocols**: Implement safety measures to prevent accidents or injuries, such as proper storage of cleaning chemicals, use of personal protective equipment (PPE), and adherence to ergonomic guidelines.
- **Comfortable Facilities**: Maintain a comfortable indoor environment through temperature control, adequate ventilation, and proper lighting.
- **Aesthetic Appeal**: Keep the workspace visually appealing by minimizing clutter, organizing supplies, and incorporating decorative elements where appropriate.
- **Employee Well-being**: Consider amenities like rest areas, hydration stations, and healthy snack options to promote employee comfort and wellness.
- **Communication**: Foster open communication channels for employees to voice concerns or suggestions regarding the work environment, demonstrating a commitment to their satisfaction and safety.

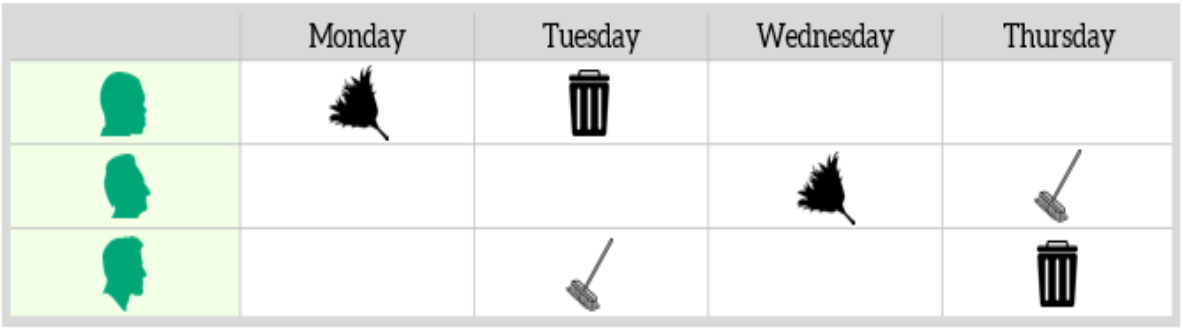


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Figure 3.15. Duty schedule showing which tasks must be performed, when, and by whom

3.4.4 Standardize

Keeping the workplace clean and tidy is a real challenge and can only be achieved if standards are established and adhered to. The **standardize** phase involves implementing clear guidelines for maintaining cleanliness and orderliness. Over time, these standards should be updated to streamline 5S practices, ensuring continued simplicity and ease of implementation.

Developing and Documenting Standardized Work Procedures:

- **Initial Assessment**: Begin by assessing the current state of the workplace to identify areas for improvement and establish baseline standards.
- **Define Procedures**: Develop clear, step-by-step procedures for each stage of the 5S methodology (Sort, Set in order, Shine, Standardize, Sustain).
- **Documentation**: Document these procedures in a comprehensive manual or guidebook accessible to all employees. Include visual aids, such as diagrams or photos, to enhance understanding.
- **Standardization Criteria**: Establish criteria for what constitutes successful implementation of each 5S stage, ensuring consistency across departments or teams.
- **Continuous Improvement**: Encourage ongoing refinement of procedures based on feedback from employees and observations of effectiveness in practice.

Training and Communication on 5S Standards:

- **Employee Training**: Provide thorough training sessions to familiarize employees with the principles and objectives of the 5S methodology.

- **Role-Specific Training**: Tailor training programs to address the specific roles and responsibilities of different staff members within the organization.
- **Interactive Workshops**: Conduct interactive workshops or hands-on simulations to reinforce key concepts and practical application of 5S principles.
- **Communication Channels**: Establish regular communication channels, such as meetings, newsletters, or digital platforms, to disseminate information about 5S initiatives and updates.
- **Leadership Support**: Ensure that organizational leaders actively endorse and promote the importance of 5S practices, leading by example in their own workspaces.
- **Monitoring and Auditing Compliance with 5S Practices:**
- **Regular Inspections**: Schedule routine inspections to assess adherence to 5S standards across different areas of the workplace.
- **Checklists and Metrics**: Develop comprehensive checklists or metrics to evaluate performance against established 5S criteria.
- **Auditing Procedures**: Conduct formal audits to verify compliance with standardized work procedures and identify areas requiring corrective action.
- **Feedback Mechanism**: Encourage employees to provide feedback on 5S implementation, including suggestions for improvement or recognition of exemplary practices.
- **Continuous Evaluation**: Continuously monitor progress and track key performance indicators related to 5S practices, adjusting strategies as needed to maintain or improve compliance levels.

3.4.5 Sustain

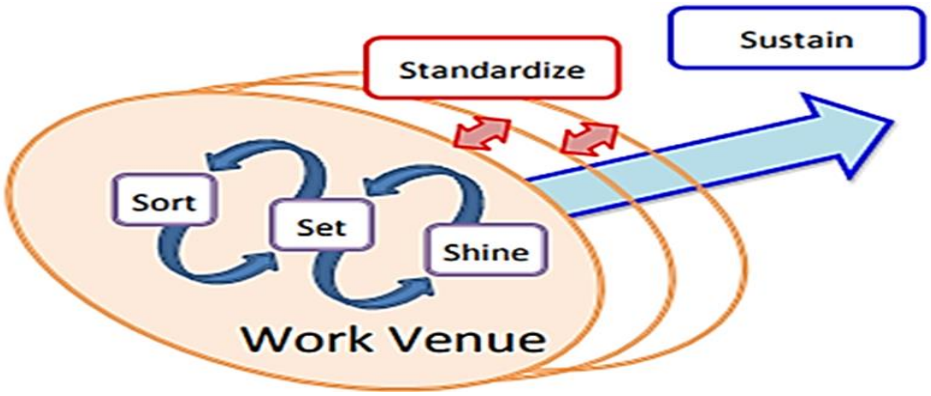

Figure 3.16. **Consistent practices of 5S**

Once the first four phases have been implemented, attention must shift to sustaining what has been accomplished. **Sustaining** is the disciplined application of the first four 'S' practices to ensure the effectiveness and longevity of the 5S program. This phase proves to be one of the most challenging parts of implementation, as many companies have found themselves with cluttered and dirty workplaces again after their initial attempt to implement 5S.

5S has a tendency to fail when there is a lack of ownership from the top and when leadership does not place continuous focus on it. Leadership must buy-in and be personally committed to ensure the success of the 5S program. They must establish a culture where 5S excellence is expected and nothing less is tolerated. Adequate planning, training, monitoring, and a formal system of accountability must exist in order for the 5S program to ensure its successful continuation.

Creating a Culture of Continuous Improvement:

- **Employee Involvement**: Foster a sense of ownership and involvement among employees by encouraging their active participation in identifying areas for improvement.
- **Feedback Mechanisms**: Establish channels for employees to provide feedback on current processes and suggest ideas for enhancement.
- **Kaizen Events**: Organize periodic Kaizen (continuous improvement) events focused on specific areas or processes, bringing together cross-functional teams to brainstorm and implement improvements.

- **Training and Education**: Offer training sessions and workshops on continuous improvement methodologies, empowering employees with the skills and mindset necessary to drive positive change.
- **Leadership Support**: Ensure that organizational leaders actively champion the importance of continuous improvement, allocating resources and providing guidance to support ongoing initiatives.

Reward and Recognition Systems for 5S Adherence:

- **Performance Metrics**: Define clear metrics for evaluating adherence to 5S principles, such as audit scores, efficiency gains, or cost savings.
- **Incentive Programs**: Implement incentive programs that reward individuals or teams for demonstrating exemplary adherence to 5S standards. This could include monetary rewards, recognition ceremonies, or other incentives tailored to organizational culture.
- **Peer Recognition**: Encourage a culture of peer recognition, where employees acknowledge and celebrate each other's contributions to maintaining a clean and organized workplace.
- **Continuous Feedback**: Provide regular feedback to employees on their performance related to 5S practices, highlighting areas of improvement and recognizing achievements.
- **Public Acknowledgment**: Showcase examples of 5S success stories and best practices across the organization, reinforcing the value of adherence to 5S principles.

Incorporating 5S Principles into Daily Routines and Habits:

- **Training and Reinforcement**: Integrate 5S training into onboarding processes for new employees and provide ongoing reinforcement through regular reminders and refresher courses.
- **Visual Management**: Use visual cues such as signage, color coding, and floor markings to remind employees of 5S principles and facilitate adherence to standardized processes.
- **Daily Huddles or Stand-Ups**: Start each workday with brief huddles or stand-up meetings to review priorities, reinforce 5S expectations, and address any immediate concerns.

- **Gemba Walks**: Conduct regular Gemba walks (on-site observations) to assess adherence to 5S principles firsthand, providing opportunities for coaching and reinforcement.

- **Lead by Example**: Encourage leaders and supervisors to model desired behaviors by consistently following 5S principles in their own workspaces and interactions.

3.5 Implementing and Sustaining 5S in the Workplace

Implementing and sustaining 5S in the workplace involves a systematic approach to organization, cleanliness, and efficiency. Here's a breakdown of key steps:

Step 1 : Initial Assessment and Planning:

- **Assess Current State:** Evaluate the current workplace conditions, identify areas for improvement, and determine the scope of the 5S implementation.
- **Set Objectives:** Define clear objectives and targets for 5S implementation, aligning them with organizational goals and priorities.
- **Create Implementation Plan:** Develop a detailed plan outlining specific task, timelines, resource requirements, and responsibilities for each stage of the 5S process.

Step 2: Training and Education:

- **Employee Training:** Provide comprehensive training to all employees on the principles, benefits, and techniques of 5S.
- **Hands-on Workshops:** Conduct hands-on workshops and simulations to reinforce learning and demonstrate practical application of 5S concepts.
- **Leadership Engagement:** Ensure active involvement and support from organizational leaders to champion the 5S initiative and promote employee buy-in.

Step 3 : Implementing 5S Stages:

- **Sort (Seiri):** Identify and remove unnecessary items from the workplace, categorizing items as necessary or unnecessary based on their value and frequency of use.
- **Set in Order (Seiton):** Organize remaining items in a systematic manner, assigning designated locations for storage and ensuring easy accessibility.
- **Shine (Seiso):** Establish cleaning routines and procedures to maintain cleanliness and orderliness in the workplace, promoting a safe and hygienic environment.

- **Standardize (Seiketsu):** Develop standardized work procedures and visual controls to sustain the gains achieved through Sort, Set in Order, and Shine stages.
- **Sustain (Shitsuke):** Implement mechanisms to sustain the 5S practices over the long term, including regular audits, performance monitoring, and continuous improvement initiatives.

Step 4 : Monitoring and Continuous Improvement:

- **Regular Audits:** Conduct periodic audits to assess adherence to 5S standards, identify areas of non-compliance, and track progress over time.
- **Feedback Mechanisms:** Solicit feedback from employees on the effectiveness of 5S practices and opportunities for improvement.
- **Kaizen Events:** Organize Kaizen events to facilitate continuous improvement efforts, encouraging cross-functional collaboration and problem-solving.

Step 5 : Recognition and Reward Systems:

- **Recognition Programs:** Implement recognition programs to acknowledge and reward individuals or teams for their contributions to 5S adherence and improvement initiatives.
- **Incentives:** Offer incentives such as bonuses, certificates, or extra time off to motivate employees to actively participate in 5S activities.
- **Peer Recognition:** Foster a culture of peer recognition where employees acknowledge and appreciate each other's efforts in maintaining a clean and organized workplace.

Step 6 : Documentation and Communication:

- **Documentation:** Maintain comprehensive documentation of 5S procedures, standards, audit results, and improvement initiatives for reference and future training.
- **Communication Channels:** Establish effective communication channels to disseminate information, updates, and best practices related to 5S implementation across the organization.

3.6 Strategies for Overcoming Challenges in Sustaining 5S Practices:

- **Leadership Commitment:** Secure commitment and support from organizational leaders to prioritize and sustain 5S practices, allocating resources and providing visible leadership.
- **Employee Engagement:** Foster employee ownership and accountability for 5S practices through involvement in decision-making, training, and recognition programs.
- **Continuous Training:** Provide ongoing training and reinforcement of 5S principles to ensure employees understand their roles and responsibilities in maintaining a clean and organized workplace.
- **Feedback Mechanisms:** Establish feedback mechanisms for employees to report issues, suggest improvements, and participate in problem-solving related to 5S practices.
- **Regular Audits and Inspections:** Conduct regular audits and inspections to assess compliance with 5S standards, identify areas for improvement, and track progress over time.

Unit Summary

5S is a process and method for creating and maintaining an organized, clean, and high performance workplace.it enables anyone to distinguish between normal and abnormal conditions at a glance. It is the foundation for continuous improvement, zero defects, cost reduction, and a safe work area.

5S is a systematic way to improve the workplace, our processes, and our products through production line employee involvement.

Sort (Seiri): Identify and remove unnecessary items from the workplace, categorizing items as necessary or unnecessary based on their value and frequency of use.

Set in Order (Seiton): Organize remaining items in a systematic manner, assigning designated locations for storage and ensuring easy accessibility.

Shine (Seiso): Establish cleaning routines and procedures to maintain cleanliness and orderliness in the workplace, promoting a safe and hygienic environment.

Standardize (Seiketsu): Develop standardized work procedures and visual controls to sustain the gains achieved through Sort, Set in Order, and Shine stages.

Sustain (Shitsuke): Implement mechanisms to sustain the 5S practices over the long term, including regular audits, performance monitoring, and continuous improvement initiatives

Leadership Commitment: Secure commitment and support from organizational leaders to prioritize and sustain 5S practices, allocating resources and providing visible leadership.

Employee Engagement: Foster employee ownership and accountability for 5S practices through involvement in decision-making, training, and recognition programs

Employee Training: Provide comprehensive training to all employees on the principles, benefits, and techniques of 5S.

Unit Review Questions

Part I. Answer the following questions correctly

1. One of the following is used to implement the third pillar of 5s- shine?
   A. Brush
   B. Hammer
   C. Hack saw
   D. Chipping hammer
2. All necessary and unnecessary items are categorized in the sorting activities
   A. True
   B. False
3. Which one is an example of shine activities?
   A. Daily sweeping and mopping of floor, bath room, corridor etc.
   B. Regular cleaning and maintenance of equipment and tools
   C. Periodical check for changes in equipment and the service area
   D. All
4. Red tag tool is used for sort activity when the items are necessary
   A. True
   B. False
5. Which one is NOT a benefit of Shine?
   A. Customer satisfaction
   B. Happier employees
   C. Improved quality
   D. inventory reduction
6. 5S should be implemented by only one person per department to save time and avoid confusion.
   A. True
   B. False

7. Which of the following is not an advantage of implementing 5S technique?

   A. To improve work efficiency
   B. To standardize work practices
   C. To improve work discipline
   D. To create a dirty workplace

8. Which of the following from the 5S technique means 'to separate out all unnecessary things and eliminate them'?

   A. Sort
   B. Standardize
   C. Sustain
   D. Shine

9. Which of the following is the correct order of 5s implementation?

   A. Sort , sustain , shine , standardize, set in order
   B. Sort , standardize , shine, set in order , sustain
   C. Sort , shine, set in order, standardize , sustain
   D. Sort, set in order, Shine, standardize, sustain

Part II Matching

A	B
1. Sort	A. Clean to inspect
2. Straighten	B. Create standards so abnormalities are easily recognized.
3. Shine	C. Apply positive tension to ensure gains are maintained.
4. Standardize	D. Get rid of the things you no longer need.
5. Sustain	E. Get a place for everything and put everything in its place.

3.7 Project Work

From your school compound select one from the following work place and apply 5s

a. Office
b. Library
c. Store
d. Department
e. Laboratory

Follow the following procedure for implementing 5s

1. Take a picture of the current status of your workplace.

2. Sort to separate anything that is needed and necessary from what is not needed.
3. Organize the things you need so that there is a place for everything and everything has a place. You should be able to find anything in just a few seconds.

4. Clean the workplace and get rid of things that make it difficult to maintain cleanliness, such as boxes on the floor that prevent you from being able to clean the entire surface label them and store them in labeled drawers, instead.
5. Take a second picture after the entire day's work, for review.

Answers for Self check questions

Unit 1 Self-check answers

Answers to self-check questions 1

1. Continuous improvement is vital in Kaizen, driving ongoing small enhancements to adapt, increase efficiency, and maintain competitiveness.
2. Toyota's Production System (TPS) influenced Kaizen by introducing JIT production, TQM, and continuous improvement, setting a global benchmark.
3. Three key Kaizen principles are: Respect for People, advocating for employee engagement; Elimination of Waste, promoting efficiency; and Quality at the Source, ensuring accountability for quality.
4. Kaizen empowers employees by involving them in problem-solving and improvement initiatives, fostering a culture of collaboration and innovation.

Answer to self-check questions 2

1. Incremental changes involve small, gradual adjustments, while radical improvements are significant and transformative changes.
2. The four phases of the PDCA Cycle are Plan, Do, Check, and Act.
3. Employee involvement enhances problem-solving and fosters a culture of ownership and accountability.
4. Quality circles are small groups of employees who collaborate to solve work-related problems.
5. Kaizen benefits include streamlined processes and standardized work procedures, leading to increased productivity and efficiency.

Unit 2 Self-check answers

Answer to self-check questions 3

1. Waste, in the context of Kaizen, refers to any activity or process that does not add value to the final product or service from the customer's perspective.
2. Obvious wastes are easily identifiable, while hidden wastes are more challenging to uncover but often have a larger impact.

3. Examples of waste include unnecessary output, input, or processing, such as excess materials, stocks, equipment, facilities, manhours, utilities, documents, expenses, motion, and other activities that do not add value

Answer to self-check questions 4

1. Muda" means waste in Japanese, and it's any activity that doesn't add value to the final product or service.
2. Overproduction is making more than what's needed, causing resource waste and delays in both manufacturing and services.
3. Excess inventory means having more materials than necessary, leading to space, cost, and working capital issues in manufacturing and services.
4. Transportation waste is unnecessary movement of materials or information, resulting in increased time, costs, and risk in both manufacturing and services.
5. Waiting-time waste is idle time due to delays, which increases lead times and costs without adding value in manufacturing and service

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MODULE IV

FIRST AID

Contents

Module Description

This module equips students with essential knowledge, attitude, and practical skills to respond effectively in emergency medical situations. It focuses on recognizing signs and symptoms of conditions requiring immediate first aid, assessing a victim's condition, managing life-threatening emergencies, handling injured or ill individuals, and evaluating a patient's status and first aid needs. The course combines classroom instruction with hands-on practice, ensuring students develop confidence and competence to act as effective first responders. Upon completion, participants will be prepared to provide vital first aid support in various settings.

Learning Outcomes

At the end of this module the student's will be able to:

- Recognize first aid
- Assess client condition
- Identify medical emergencies
- Provide first aid for individual who seek lifesaving care
- Handle victim
- Perform evaluation of client

UNIT 1

Recognizing First Aid

1.1. Introduction

First aid is the care given when an accident or sudden illness occurs or immediate care given to a person who has been injured until he / she is taken to health facilities.

Providing proper and timely first Aid in emergency situations requires the ability to quickly and effectively recognize a client's condition. First responds can increase the likelihood of a successful outcome by using effective assessment skills to prioritize actions, identify potentially life-threatening conditions, and start appropriate care. For emergency response to be delivered in a safe and efficient manner, it is imperative to comprehend the significance of client evaluation in the context of First Aid.

Learning Outcomes

After completing this unit, the students will be able to:

- Describe first aid
- Explain common terms related to first aid
- Identify key aspects of first aid

  Key terms: injury, life-threatening, first aid

1.2. Concepts of First Aid

First aid is the initial assistance given to a person who has been injured or suddenly becomes ill before professional medical help arrives. It is a crucial skill that anyone can learn and apply, as it can make a significant difference in saving lives and reducing the severity of injuries. The primary goal of first aid is to preserve life, prevent further harm, and promote recovery. By administering timely and appropriate first aid techniques, you can stabilize a person's condition and provide comfort and reassurance until medical professionals take over.

First aid is not a substitute for professional medical care, but it plays a vital role in providing immediate support in emergency situations. It is important to remember that every second counts, and your quick actions can significantly impact the outcome for the injured or ill person. In order to provide effective first aid, it is essential to have a basic understanding of common injuries, illnesses, and medical emergencies. This includes recognizing signs and symptoms, knowing how to assess the situation, and applying appropriate techniques to address the specific needs of the individual.

Key aspects first aid include

- **Assessing the Situation**: The first step in providing first aid is to assess the situation and ensure your safety as well as the safety of others. Identify any potential hazards or dangers before approaching the injured or ill person.
- **Ensuring ABC**: The "ABC" of first aid stands for Airway, Breathing, and Circulation. It involves checking for an open airway, ensuring the person is breathing, and assessing their circulation (pulse). If any of these are compromised, appropriate actions such as clearing the airway or performing cardiopulmonary resuscitation may be necessary.
- **Calling for Help**: If the situation is serious or beyond your ability to handle, call the emergency services or ask someone nearby to do so. Professional medical assistance is crucial in severe cases.
- **Providing Basic Life Support**: Basic life support techniques, such as cardiopulmonary resuscitation are used to maintain blood circulation and oxygenation when a person's heart or breathing has stopped. Cardiopulmonary resuscitation involves chest compression and rescue breaths.
- **Managing Bleeding and Wounds**: Controlling bleeding is important to prevent excessive blood loss. Techniques such as applying direct pressure, elevating the injured area, and using pressure dressings can help manage bleeding. Cleaning and dressing wounds properly can reduce the risk of infection.
- **Handling Fractures and Sprains**: Immobilizing fractures and supporting sprained joints help prevent further injury. Techniques like splinting and applying ice packs can aid in reducing pain and swelling.

- **Dealing with Burns and Scalds**: First aid for burns involves cooling the affected area with cool running water, covering the burn with a clean cloth, and seeking medical attention for severe burns.
- **Recognizing and Responding to Medical Emergencies**: First aid also includes recognizing signs and symptoms of medical emergencies such as heart attacks, strokes, seizures, allergic reactions, and providing appropriate initial care until professional help arrives.
- **Providing Emotional Support**: Offering reassurance, comfort, and staying calm can greatly help individuals in distress. Ensuring their emotional well-being is an important part of first aid.

Common medical terminology uses in first Aid

Anybody can more easily provide the appropriate first aid in an emergency if they are familiar with the following medical terminologies. It is crucial to remember, however, that in addition to first aid, prompt access to expert medical assistance should always be sought. Remember that the primary goals of first aid are to provide temporary support and stabilize the patient until medical personnel arrive to handle the problem.

- Cardiopulmonary Resuscitation: is a lifesaving technique performed on individuals experiencing cardiac arrest or cessation of breathing. It involves a combination of chest compression and rescue breaths to maintain blood circulation and oxygenation until professional medical help arrives.
- Hemorrhage: refers to uncontrolled or excessive bleeding from a blood vessel.
- Fracture: is a break or crack in a bone caused by trauma or injury.
- Sprain: occurs when the ligaments surrounding a joint are stretched or torn due to sudden twisting or wrenching movements.
- Anaphylaxis: is a severe and potentially life-threatening allergic reaction to an allergen, such as certain foods, medications, or insect stings.
- Seizure: is a sudden, uncontrolled electrical disturbance in the brain that can cause a variety of symptoms, including muscle convulsions, loss of consciousness, and altered behavior.

- **Burns**: are injuries to the skin and underlying tissues caused by heat, chemicals, electricity, or radiation.
- **Cardiac Arrest**: Cardiac arrest refers to the sudden cessation of the heart's pumping action.
- **Stroke**: occurs when there is a disruption in the blood supply to the brain, leading to cell damage and loss of brain function.
- **Hypovolemia**: refers to a decreased volume of blood circulating in the body, often caused by severe bleeding or fluid loss.
- **Dislocation**: A dislocation occurs when the ends of a bone are forced out of their normal position at a joint.
- **Myocardial Infarction**: commonly known as a heart attack, occurs when the blood flow to the heart muscle is blocked, leading to tissue damage.
- **Diabetic Emergency**: can occur when a person's blood sugar levels become too high (hyperglycemia) or too low (hypoglycemia).
- **Pneumothorax**: is a condition characterized by the presence of air in the space between the lungs and the chest wall, causing lung collapse.
- **Heat Exhaustion**: is a heat-related illness that occurs due to prolonged exposure to high temperatures and inadequate fluid intake. It is characterized by symptoms such as excessive sweating, weakness, dizziness, and nausea.
- **Frostbite**: is a condition that occurs when tissues freeze due to exposure to extremely cold temperatures.
- **Concussion**: is a mild traumatic brain injury resulting from a blow or jolt to the head. It can cause temporary loss of consciousness, confusion, headache, and dizziness.
- **Shock**: is a life-threatening condition that occurs when the body's organs and tissues do not receive enough blood flow and oxygen. It can be caused by various factors, including severe bleeding, trauma, or severe infection.
- **Choking**: happens when an object or food becomes lodged in the throat, blocking the airway. It can lead to difficulty breathing or complete obstruction.
- **Hypothermia**: occurs when the body loses heat faster than it can produce, resulting in a dangerously low body temperature.

- **Hyperthermia**: is a condition characterized by an elevated body temperature due to excessive heat exposure or strenuous physical activity in hot environments. It can range from heat exhaustion to heatstroke, which is a medical emergency.
- **Drowning**: occurs when a person's airway becomes blocked by water or other fluids, leading to respiratory distress and potential loss of consciousness.
- **Asthma Attack**: is a sudden worsening of asthma symptoms, such as wheezing, shortness of breath, coughing, and chest tightness.
- **Allergic Reaction**: occurs when the body's immune system overreacts to a substance, known as an allergen, resulting in symptoms such as itching, hives, swelling, and difficulty breathing.
- **Fainting**: also known as syncope, is a temporary loss of consciousness caused by a temporary decrease in blood flow to the brain. It can be triggered by various factors, such as low blood sugar, dehydration, or emotional stress.
- **Disinfection**: is the process of reducing or eliminating microorganisms, such as bacteria and viruses, from surfaces or objects to prevent the spread of infection.
- **Tourniquet**: is a device, such as a band or strap, used to compress or constrict blood vessels to stop severe bleeding from an extremity. It is typically used when direct pressure or other measures are inadequate or impractical. Applying a tourniquet should be done carefully and as a last resort, as it can cause tissue damage if left in place for too long.
- **Automated External Defibrillator (AED)**:is a portable device that delivers an electric shock to the heart in cases of sudden cardiac arrest.
- **Secondary Survey**: is a systematic assessment conducted after addressing any immediate life-threatening conditions in a first aid situation.
- **Abdominal Thrusts**: also known as the Heimlich maneuver, are a technique used to clear a blocked airway in a conscious person who is choking.
- **Sign**: Objective, observable, and measurable indication of a disease, condition, or injury that can be detected by healthcare providers.
- **Symptom**: Subjective indication or experience reported by an individual that cannot be directly observed by others.

1.2. Self-check questions

1. What is the primary goal of first aid?
2. Why is it important to assess the situation before providing first aid?
3. When should you call for professional medical help during a first aid situation?
4. Define the following medical terminologies used in first aid:
    A. CPR
    B. Hemorrhage
    C. Fracture
    D. Anaphylaxis

5. What is the difference between a symptom and a sign?

Unit Summary

The most important skills for first aid assessment are the ability to quickly evaluate a situation, recognize potentially life-threatening conditions, and provide urgent treatment until professional medical care arrives. The main goals are to preserve life, prevent further harm, and accelerate healing. A thorough understanding of common injuries, illnesses, and medical emergencies is necessary to identify when first aid is needed. Knowing the signs and symptoms allows first responders to provide focused, immediate care.

Familiarity with medical terminology is also essential. Knowing terms like CPR, hemorrhage, fracture, anaphylaxis, and others enables better communication with medical professionals and more effective first aid. People who have knowledge of medical conditions, injuries, and terminology can make valuable contributions to the first aid process. This allows them to rapidly assess the situation, identify critical issues, and provides appropriate assistance right away, improving the chances of a positive outcome for those in need.

Unit Review Questions

1. The primary objective of first aid recognition is:

   A. To assess the situation quickly
   B. To identify life-threatening conditions
   C. To provide immediate support
   D. To communicate effectively with medical professionals

2. Why is it important to have a comprehensive understanding of common injuries,illnesses, and medical emergencies in first aid recognition?

   A. To communicate effectively with medical professionals
   B. To assess the severity of a situation
   C. To provide timely and targeted assistance
   D. All of the above

3. Familiarity with medical terminologies contributes to effective first aid recognition by:

   A. Enabling accurate communication with medical professionals
   B. Facilitating understanding of signs and symptoms
   C. Enhancing teamwork during emergencies
   D. All of the above

4. Which of the following is an example of a life-threatening condition that requires immediate support during first aid recognition?

   A. Minor cut
   B. Sprained ankle
   C. Cardiac arrest
   D. Nosebleed

5. How does first aid recognition contribute to preserving life, preventing further harm, and promoting recovery?

   A. By providing immediate support until professional help arrives
   B. By assessing the severity of the situation
   C. By administering appropriate first aid techniques
   D. All of the above

UNIT 2

Assessment of Client Condition

2.1. Introduction

First aid involves a thorough assessment of the client's condition to determine the nature and severity of the injury or illness. This assessment helps prioritize care and provide necessary support to preserve life and prevent further harm. It is crucial to approach the situation with caution and ensure your own safety. The **ABC**s of first aid are assessed, including the client's Airway, Breathing, and Circulation. The client's specific injuries or medical conditions are evaluated, including visible injuries, bleeding, deformities, and complaints of pain. If bleeding occurs, direct pressure should be applied, fractures or sprains immobilized, shock signs should be recognized, and allergic reactions should be addressed. Emotional support is essential during the assessment, and the information gathered will guide subsequent actions. If the client's condition is serious or beyond your expertise, professional medical help should be sought.

Learning outcomes:

After completing this unit, the students will be able to:

- Identify emergencies problems
- Assess vital signs of the client with emergencies
- Gather information about victim and emergency condition
- Monitor and document the client condition.

Key terms: assessment, client, Emotional support, vital signs

2.2. Emergency Assessment and Recognition

The general procedures for determining emergency circumstances are outlined below.

- Observation: Get started by taking in the surroundings and the people in question. Seek out any overt indications of danger, damage, or distress. Observe any odd scents, sounds, or visual signs that might point to a crisis.

- Gather information: Get as much information as you can about the circumstances as soon as you can. This may entail conversing with onlookers, victims, or witnesses. Inquire to learn more about the incident, the parties involved, and any particular worries or symptoms.
- Scene safety: Before continuing, make sure that everyone is safe, including yourself. Examine the area for any potential dangers, such as poisonous materials, fire, or continuing fighting. Prioritize your own safety and think about contacting for expert help if the situation is dangerous.
- Main assessment: Evaluate every person concerned about the emergency in a main manner. Check to see if they have a pulse, are breathing, and are cognizant. This preliminary evaluation aids in the identification of urgently life-threatening illnesses, such as cardiac arrest or serious bleeding, that need for prompt medical attention.
- Secondary assessment: Carry out a more thorough secondary assessment after dealing with any urgent life threats. This is a methodical assessment of the patient's wounds or symptoms. In order to aid determine the proper care or intervention, look for any more injuries, evaluate vital signs (blood pressure, respiration rate, and pulse), and gather more information.
- Recognize symptoms and signs: Acquire the ability to identify typical symptoms and indicators connected to various emergency situations. Heart attacks, strokes, allergic reactions, respiratory problems, seizures, and severe injuries are among the conditions covered by this. Knowing these telltale indications and symptoms can help you make wise choices and respond appropriately.
- Document and report: It is essential to document the assessment findings and communicate them to the appropriate authorities or healthcare professionals. Accurate and timely reporting helps ensure a coordinated response and continuity of care.
- Ongoing monitoring: Continuously monitor the individuals involved and reassess their condition as necessary. Emergency situations can evolve rapidly, so it's important to adapt your response and interventions accordingly. Prioritize care: Sort the necessary care or interventions based on your assessment. Assign resources in

accordance with the situation's urgency and severity. This could be giving first assistance, contacting the police, clearing a location, or carrying out emergency response plans.

Recognize all these actions offer a broad framework for determining what constitutes an emergency. Depending on the emergency's circumstances and nature, several protocols might apply.

Principle of assessment

- Be calm and confident.
- Talk, listen & reassure the conscious causality.
- Check safety of casualty and of yourself
- Check for breathing, bleeding and level of consciousness
- Get others to help / (Emergency Medical Staff)
- Components of assessment process

2.2 Self-check question.

1. What are the procedures involved in the initial assessment of an emergency situation?
2. Gathering information is important in assessing emergency situation. Why?

2.3. Asses vital signs of client

2.3.1 Introduction

Measuring vital signs in first aid is crucial for identifying medical emergencies, assessing severity, monitoring treatment effectiveness, making informed decisions, communicating with healthcare professionals, recognizing complications early, and providing a baseline for comparison. Abnormal vital signs can indicate the need for immediate medical attention, while accurate documentation enables effective communication with healthcare professionals. Monitoring vital signs over time helps determine the effectiveness of interventions and treatments, and providing a baseline for future comparisons helps track progress and detect deviations from normal.

Basic Life Support (BLS) involves the initial ABC assessment and management of individuals who are sick or injured. This crucial care can be provided by trained

individuals, both medical and non-medical, until the person can receive definitive medical treatment.

The primary objectives of the BLS primary assessment, often referred to as the “3 Ps," are as follows:

- **Preserve life**: The immediate focus is on conducting a thorough ABCD assessment and implementing appropriate management techniques. This ensures that the person's airway, breathing, circulation, and disability are promptly evaluated and addressed.
- **Prevent further injury**: In cases of trauma, special attention is given to protecting the cervical spine (C-spine) to avoid exacerbating any potential spinal injuries. This precautionary measure helps minimize the risk of additional harm.
- Promote recovery: BLS providers support recovery by administering supplemental oxygen when necessary, preventing aspiration of fluids or foreign objects, and managing pain effectively. These interventions contribute to a safer and more comfortable. Following the BLS protocol, responders can provide immediate care and support while waiting for more advanced medical assistance. It is important to note that BLS should always be complemented by seeking professional medical help as soon as possible in severe or life-threatening situations.

Self-Check 2.3.1

1. What are the primary objectives of the BLS primary assessment?
2. Why is measuring vital signs in first aid crucial?

2.3.2 Vital Signs' Significance in First Aid

- **Early Medical Emergency Detection**: Life-threatening illnesses such as shock, heart attack, or stroke can be detected with the use of vital signs. Vital signs that are abnormal may require emergency medical intervention.
- **Severity Assessment**: Objective information is provided by vital signs to determine the extent of an illness or injury.

- **Tracking Response to Treatment**: By tracking vital signs over time, healthcare professionals may keep an eye on how well interventions and treatments are working.
- **Making Informed judgments in First Aid Situations**: Vital signs offer vital information that is essential for making well-informed judgments.
- **Communication with Healthcare providers**: Good communication with healthcare providers is made possible by accurate vital sign documentation.
- **Early Complication Recognition**: Vital signs aid in the early detection of complications or alterations in a patient's health.
- **Baseline for Comparison**: Vital indicators offer a starting point for comparisons in the future.

Self-check 2.3.2

1. How do vital signs contribute to early detection of life-threatening emergencies in first aid?
2. What is the role of vital signs in making informed judgments during first aid situations?
3. Why are accurate vital sign documentation important for communication with healthcare providers in first aid?

2.3.3 Definition of taking vital signs

Taking vital signs are defined as the procedure that takes the sign of basic physiology that includes temperature, pulse, respiration and blood pressure. If any abnormality occurs in the body, vital signs change immediately.

Figure 2.1. Equipment’s required for taking vital signs

Equipment required taking vital signs

- **Blood Pressure Cuff**: Basic sphygmomanometer with inflatable cuff and pressure gauge.
- **Stethoscope:** Basic stethoscope with chest piece and earpieces. Acoustic stethoscopes suitable for students learning vital signs.
- **Thermometer:** Digital thermometer recommended for ease of use and accuracy.
- **Stopwatch or Timer**: Handheld or digital timer for accurate pulse rate or respiratory rate assessments.
- **Pen and Paper or Vital Signs Chart**: Students can record vital sign measurements using a pen or pencil and paper or a printed or electronic chart.
- **Pulse oximetry**: is a painless, noninvasive method of measuring the saturation of oxygen in a person's blood.
- Equipment availability and specific requirements may vary depending on school resources and budget.

Self-check question 2.3.3

1. What is vital sign?
2. List all the necessary equipment’s to take vital sign

2.3.4 Measuring Temperature

For students studying community health nursing, taking precise temperature readings is a critical competency. It aids in evaluating and keeping track of community members' health conditions. A temperature reading is a crucial indicator that can reveal important details regarding the existence of a fever or possible diseases.

Technique for Measuring Temperature

- Wash hands thoroughly with soap and water or hand sanitizer.
- Select a clean, digital thermometer for ease of use and accuracy.

- Prepare the individual by explaining the procedure and assisting them in a suitable position for temperature measurement.
- Oral Temperature Measurement Process
    - Use a disposable probe cover on the thermometer.
    - Open mouth and place the thermometer under the tongue.
    - Keep mouth closed and breathe through nose.
    - Wait for recommended time (30 seconds to 1 minute) or until thermometer signals completion.
    - Remove thermometer and read the temperature on the display.
    - Normal range for oral temperature is 36.5°C to 37.5°C.

Figure .2.2. Measuring of oral temperature

Axillary Temperature Measurement:

- Ensure dry armpit.
- Place thermometer in center of armpit.
- Hold arm against body for 3 to 5 minutes.
- Remove thermometer and read temperature on display.
- Normal range: 35.9°C to 36.9°C (96.6°F to 98.4°F)

Figure .2.3. Measuring Axillary Temperature

Other Temperature Measurement Methods

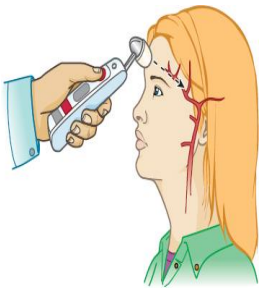
Rectal temperature measurement:

- Lubricate thermometer probe with water-soluble lubricant and insert into rectum.
- Normal range: 36.6°C to 38°C (97.9°F to 100.4°F).

Figure. 2.4. Measuring Rectal Temperature

6.1. Temporal artery or forehead temperature measurement

- Follow manufacturer's guidelines, place probe on forehead or temple area.
- Normal range: 35.8°C to 37.5°C (96.4°F to 99.5°F).



A. Measuring forehead

B. Measuring temporal temperature

Figure .2.5. Measuring forehead and temporal temperature

Temperature Measurement Considerations:

- Age-Specific Guidelines: Different methods for infants, children, and adults.
- Infection Control: Proper hygiene, including cleaning and disposable probe covers.
- Accuracy Verification: Regular checks based on manufacturer's instructions or calibration guidelines.
- Documentation: Accurate recording of temperature measurement, time, and method.
- Professionalism and Communication: Respect for privacy, clear communication throughout the procedure.

Accurately measuring one's body temperature is a critical competency for medical practitioners. High school students participating in the level one community health program can guarantee accurate temperature assessments by adhering to the right procedures and guidelines. This will help in the detection of fever and the tracking of temperature variations in the body.

Self-Check question 2.3.4

1. What is the normal range for oral temperature measurement?
2. How is axillary temperature measured
3. What are some considerations for temperature measurement?

2.3.5. Taking pulse

For health professionals- which include high school students enrolled in community health programs- taking a pulse measurement is an indispensable skill. When assessing a person's

cardiovascular health, a pulse measurement can reveal important details about their heart rate and rhythm.

Technique for Measuring Heart Rate

- Wash hands thoroughly with soap and water or hand sanitizer.
- Locate the pulse site at radial, carotid, brachial, or femoral arteries.
- Position the individual in a comfortable position and encourage relaxation.
- Find the radial pulse by placing index and middle fingers on the wrist's thumb side.
- Use a stopwatch or timer to count the number of pulsations felt within a specific time frame.
- Calculate the heart rate by multiplying the number of beats counted by 2 for 30 seconds and directly representing it for one minute.

Pulse Measurement Considerations

- Accuracy: Ensure fingers are placed over artery without excessive pressure.
- Communication: Explain procedure and provide reassurance.
- Respect privacy and professionalism.
- Recording and Documentation: Accurately record location, time, and heart rate.
- Use appropriate documentation methods like a pulse log or electronic medical record system.

Normal Range

- The normal resting heart rate for adults is typically between 60 and 100 beats per minute.
- In children, heart rate varies with age
- Newborns (0-3 months): 70-190 beats per minute.
- Infants (3-6 months): 80-160 beats per minute.
- Babies (6-12 months): 80-140 beats per minute.
- Toddlers (1-3 years): 80-130 beats per minute.
- Preschoolers (3-5 years): 80-120 beats per minute.
- School-age children (6-12 years): 70-110 beats per minute.
- Adolescents (12-18 years): 60-100 beats per minute.

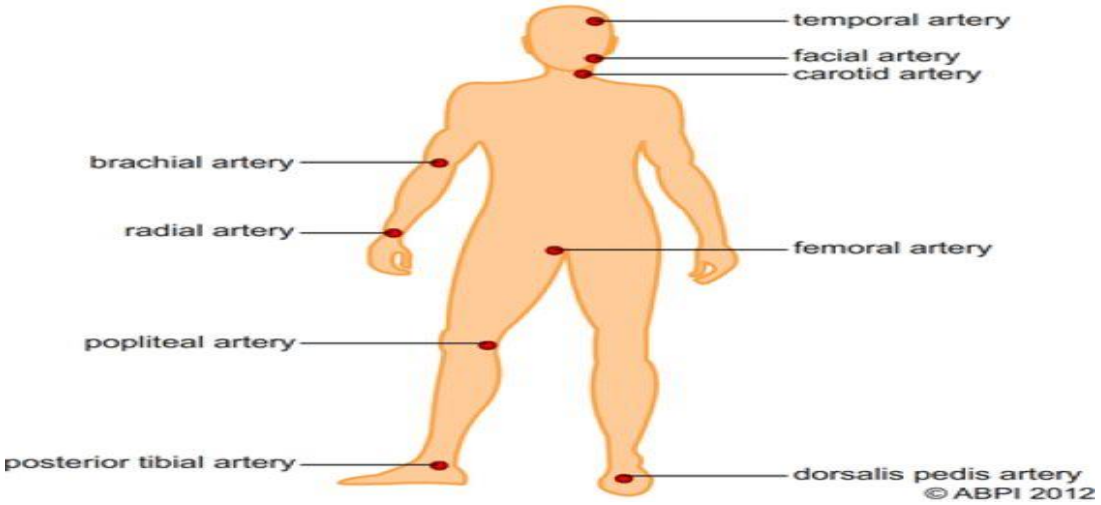


Figure 2-6. Sites to take pulse

Figure 2.7.Common sites to take pulse rate

Self -check question 2.3.5

1. How is the pulse measured?
2. What is the normal range for resting heart rate in adults?
3. What are the sites to take pulse?

2.3.6 Taking Respiration

Respiration refers to the process of breathing in and out, which gives the organism oxygen and expels carbon dioxide. It allows the diaphragm and chest to move, which permits the lungs to exchange gases.

Assessing Respiratory Rate

- Prepare the Individual: Ensure comfort and cooperation by explaining the procedure and arranging for a relaxed position.

- Observe Chest Movements: Visually observe the rise and fall of the chest or gently feel the movements.
- Count the Respirations: Use a stopwatch or timer to count the number of complete breaths for a specific time frame.
- Document the Respiratory Rate: Accurately record the respiratory rate, noting the number of breaths per minute and any irregularities.

Respiratory Rate Assessment in Community Health Nursing

- Normal Respiratory Rate: Adults' resting respiratory rate is 12-20 breaths per minute.
- Communication: Maintain clear communication with the individual, reassurance, and respecting privacy.
- Accuracy: Focus on chest movements and count each complete breath. Repeat measurements if irregularities or inconsistencies are observed.
- Recording and Documentation: Accurately record the respiratory rate, including the time of measurement. Use appropriate documentation methods like vital signs chart or electronic medical record system.

Figure 2.8.Counting respiratory rate

Normal ranges for respiratory rate in different age groups

- Newborns (0-1 month): 30-60 breaths per minute
- Infants (1-12 months): 25-40 breaths per minute
- Toddlers (1-3 years): 20-30 breaths per minute
- Preschoolers (3-5 years): 20-30 breaths per minute

- School-age children (6-12 years): 14-22 breaths per minute
- Adolescents (12 years and older): 12-20 breaths per minute

It's crucial to remember that these ranges are only suggestions and could change slightly based on the specific source and situation. In addition, variables like emotional mood, sickness, and degree of exertion might affect respiratory rates. When evaluating someone's respiratory rate, always take the whole clinical picture into account. For more detailed instructions, speak with medical professionals or consult reliable sources.

Self-Check questions 2.3.6

1. What is the purpose of measuring respiratory rate?
2. What is the normal range for respiratory rate in adults?
3. How can accuracy be ensured when counting respiratory rate?
4. How does respiratory rate vary in different age groups?
5. Why is it important to document the respiratory rate accurately?

2.3.7 Taking blood pressure

One of the most important skills for high school students studying community health services is taking blood pressure. Assessment of blood pressure aids in the diagnosis of hypertension and the assessment of cardiovascular health.

Method for Measuring Blood Pressure

- Prepare the Person: Assure their comfort and cooperation while outlining the process.
- Pick the Right Cuff: Select a cuff size that covers 80% of the diameter of the upper arm and is appropriate for the person's arm circumference.
- Position the Cuff: Center the brachial artery over the lower edge of the cuff, about 2.5 cm above the elbow bend.
- Palpate the Brachial Artery: Locate the brachial artery on the inside of the arm with your fingertips.
- Inflate the Cuff: Shut off the air valve and continue pumping air until the blood pressure rises over the predicted systolic level.
- Deflate the Cuff: To deflate the cuff gradually, slowly open the air valve. Listen for the first sound, which indicates the systolic pressure, and keep deflating until the sounds stop (this indicates the diastolic pressure).

N.B. Take Note of the Blood

Considerations

1. Normal Blood Pressure Ranges:

- The normal blood pressure for adults is typically around 120/80 mmHg.
- Blood pressure ranges can vary based on age, sex, and individual circumstances.

2. Age-Specific Blood Pressure Ranges

- Normal blood pressure ranges for different age groups include:
- Newborns (0-1 month): 60-90/20-60 mmHg
- Infants (1-12 months): 70-100/50-70 mmHg
- Children (1-10 years): 80-110/50-70 mmHg
- Adolescents (11-17 years): 90-120/60-80 mmHg

Figure .2.9.Measuring blood Pressure

Self Check questions 2.3.7

1. What is blood pressure?
2. How is blood pressure measured?
3. What are the two numbers in a blood pressure reading?
4. What is considered normal blood pressure?

Unit Summary

Vital signs are important measurements that provide information about a person's physiological status. They include temperature, blood pressure, pulse, and respiration rate.

Temperature: Temperature is a measure of the body's internal heat. It is typically measured using a thermometer and can be taken orally, rectally, tympanically (eardrum), or axillary (under the arm). Normal body temperature ranges from 36.5 to 37.5 degrees Celsius (97.7 to 99.5 degrees Fahrenheit).

Blood Pressure: Blood pressure is the force exerted by circulating blood against the walls of the arteries. It is measured using a sphygmomanometer and reported as two numbers: systolic pressure over diastolic pressure. Normal blood pressure is around 120/80 mmHg, with systolic pressure representing the pressure during heart contraction and diastolic pressure representing the pressure during heart relaxation.

Pulse: Pulse refers to the rhythmic expansion and contraction of arteries as a result of the heartbeat. It is measured by locating pulse sites, such as the radial artery (wrist), carotid artery (neck), or femoral artery (groin), and counting the number of pulsations per minute. The normal resting heart rate for adults is typically between 60 and 100 beats per minute.

Respiration: Respiration refers to the process of inhaling and exhaling air. Respiratory rate is the number of breaths taken per minute. It is measured by observing the rise and fall of the chest or feeling chest movements. The normal resting respiratory rate for adults is typically between 12 and 20 breaths per minute.

Monitoring vital signs is crucial in assessing a person's overall health and detecting any abnormalities or changes that may require medical attention. These measurements provide valuable information for healthcare professionals in making diagnoses, monitoring treatment effectiveness, and ensuring patient well-being.

Unit Review Questions

1. What are ABC rules in first aid?

A. Assess, Bandage, Call for help

B. Airway, Breathing, Circulation

C. Apply pressure, Bind the wound, Check for allergies

D. Administer CPR, Bandage the wound, Check for consciousness

2. What is the purpose of following the ABC rules when giving first aid service for victims?

A. To ensure the comfort of the victim

B. To prevent infection in the wound

C. To prioritize the most life-threatening conditions

D. To gather information about the incident

3. Which of the following vital signs should be assessed when evaluating a client with an emergency condition?

A. Blood type

B. Body temperature

C. Height and weight

D. Respiratory rate

4. What is the normal range for adult respiratory rate?

A. 10-20 breaths per minute

B. 30-40 breaths per minute

C. 60-80 breaths per minute

D. 60-80 breaths per minute

5. While assessing the client's pulse, you should check for:

A. Blood pressure

B. Heart rate

C. Oxygen saturation

D. Body temperature

6. What is the normal range for adult heart rate at rest?

A. 30-50 beats per minute

B. 60-100 beats per minute

C. 120-140 beats per minute

D. 160-180 beats per minute

7. When assessing blood pressure, it is measured using two values: systolic and diastolic. Which of the following represents a normal blood pressure reading for adults?

A. 90/60 mmHg

A. 120/80 mmHg

B. 140/90 mmHg

C. 160/100 mmHg

UNIT 3

Providing First Aid for Emergency Conditions

3.1 Introduction

Emergency condition identification is a crucial aspect of community health service. Even though high school students may not possess the comprehensive medical training of healthcare professionals, they can still play a vital role in providing immediate first aid during emergencies. This unit will outline some common emergency conditions that high school students studying Community health service should know, such as respiratory distress, blood circulation issues, and acute diseases. It will also provide an overview of the first aid measures they can take to stabilize individuals and ensure their well-being until professional medical help arrives.

Learning outcomes

After the completion of this unit, the students will be able to:

- Provide first aid for common respiratory emergencies
- Provide first aid for common cardiovascular emergencies
- Provide first aid for common musculoskeletal emergencies
- Provide first aid for common emergencies problems

  Key terms: emergency, stabilize individuals, distress

3.2 Acute respiratory diseases

A. Airway parts and their function

- Mouth to breathe and chew food.
- Nose filtering, heating the air we breathe. Keep it moist

The throat is divided into two parts. It starts at the top of our neck and there are two bangs in this area; one is the alimentary canal, whose function is to transport the chewed food to the stomach. Another one is called Air pipe. Its job is to receive air from the mouth and nose and transfer it to the lungs. Because these organs are close to each other, when we eat and talk, when we laugh, the part that closes the windpipe opens, so food can get into the windpipe or windpipe and block the windpipe, which can lead to serious problems and even death.

In order to facilitate the diffusion of oxygen into the bloodstream and move air into the lungs, humans need a respiratory system. Furthermore, it takes in and releases waste carbon dioxide from the blood. The anatomy of the airways and the blood's process of receiving oxygen are described here.

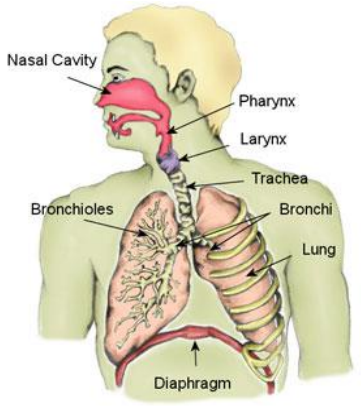


Figure. 3.1. Anatomy of Respiratory system

B. Blood circulation system

The primary function of the tiny, muscular organ known as the heart is to pump blood to and from the body's numerous organs. The four chambers make up the human heart. They are referred to as the left auricle, left ventricle, right auricle, and right ventricle. The top chambers are referred to as the atrium or auricle. The ventricle is the term for the lower chambers. The way the blood is pumped is explained as follows:

From the body → Right Auricle → Right Ventricle → Pulmonary Artery → Lungs → Pulmonary Vein → Left Auricle → Left Ventricle → To the body

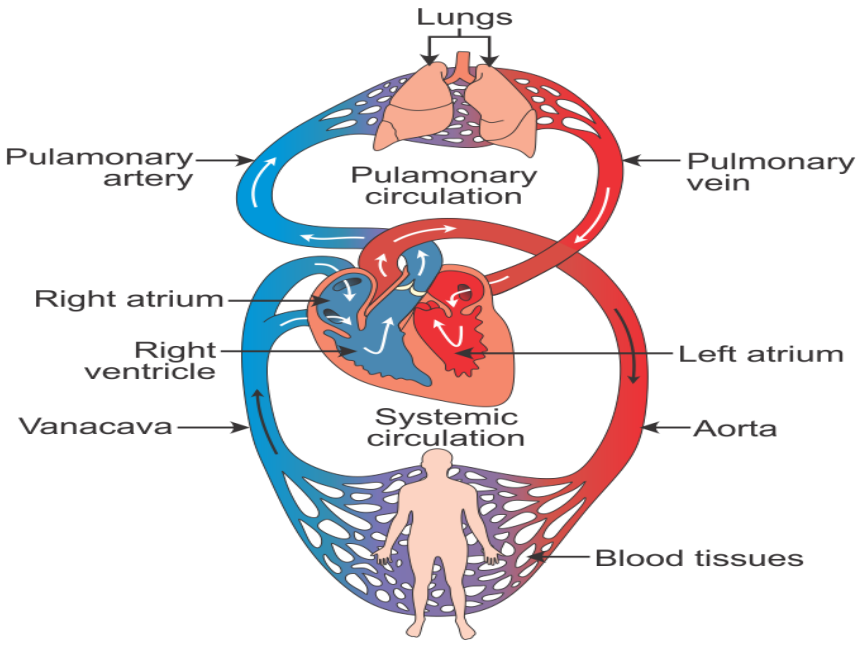


Figure .3.2. Blood circulation

Heart beat

When the heart pumps blood, different cardiac chambers contract and relax. The heartbeat is the pounding sound that is produced by the muscles contracting and relaxing. One heartbeat is indicative of one heart-pumping cycle. The heart of a typical human pumps roughly 72 times in a minute. The heart can pump 70 milliliters of blood to the body in a single beat. This suggests that the heart can pump approximately five liters of blood in a minute.

Pulse

The heartbeat can be heard or felt in certain parts of the body, such as the area around the wrist, neck, or ankle. The fundamental cause behind this is the rushing of blood with every heartbeat. One useful tool for determining your heartbeat is your pulse. This is what medical professionals do when using stethoscopes. It consists of two earpieces, a diaphragm, and long rubber tubing. That concludes our overview of the fundamentals of the human circulatory system

The circulatory system delivers oxygen and nutrients to cells and takes away wastes. The heart pumps oxygenated and deoxygenated blood on different sides. The types of blood vessels include arteries, capillaries and veins.

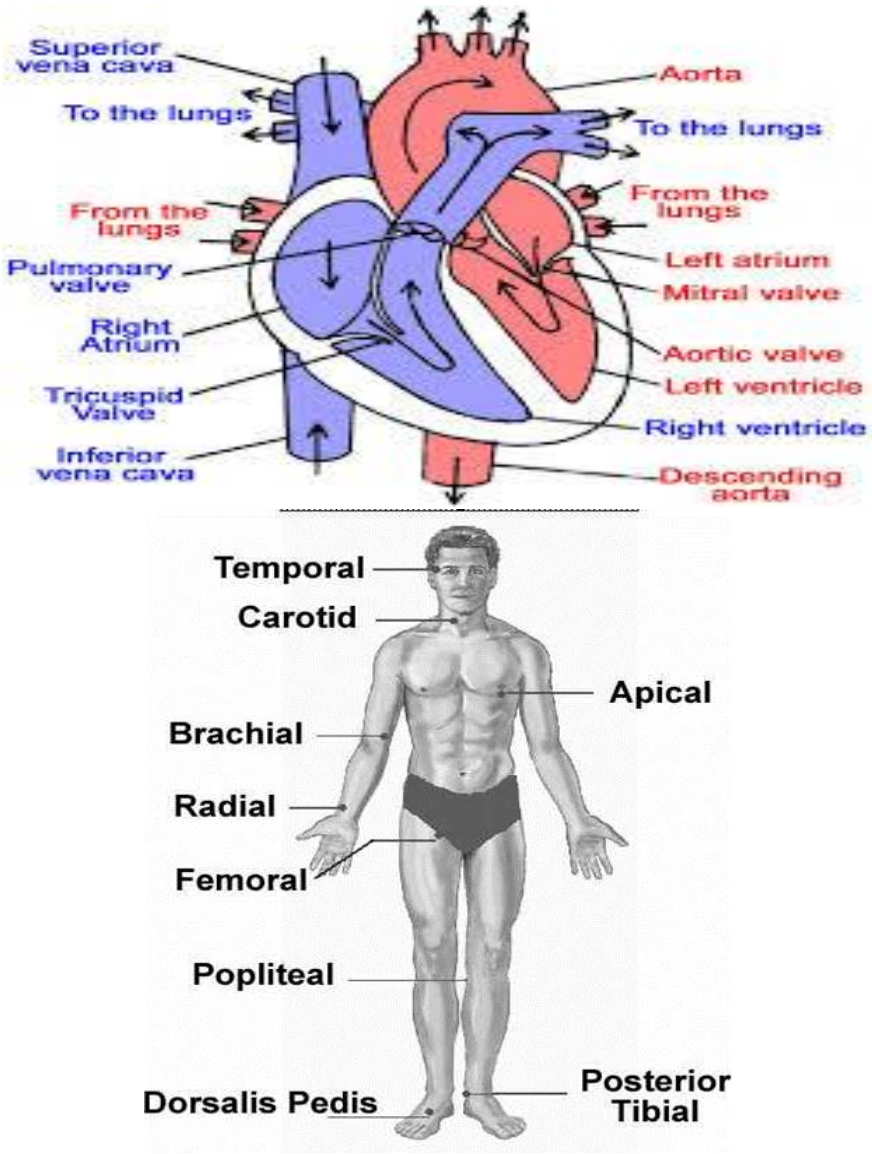


Figure.3.3. Anatomy of cardiovascular system

Self-Check Questions 3.2

1. What are the functions of the mouth and nose in the airway?
2. Why is it important for the windpipe to remain unobstructed?
3. What is the main function of the respiratory system?
4. What is the main function of the heart in the blood circulation system?
5. What are the four chambers of the human heart?

3.3. Common emergency respiratory conditions

Acute respiratory emergencies are sudden, life-threatening conditions that affect a person's ability to breathe effectively. These conditions require immediate first aid and medical attention to prevent serious complications or even death. As high school students, it is important to have a basic understanding of common acute respiratory emergencies so that you can recognize the symptoms and take appropriate action in an emergency situation. Providing timely and proper first aid can make a critical difference in the outcome for the affected individual.

3.3.1 Asthma

Definition

Asthma is a chronic respiratory condition characterized by inflammation and narrowing of the airways, resulting in difficulty breathing. Characterized by at least partially reversible airway inflammation and reversible airway obstruction due to airway hyper reactivity, asthma is a rather common illness. It can be acute, sub-acute or chronic

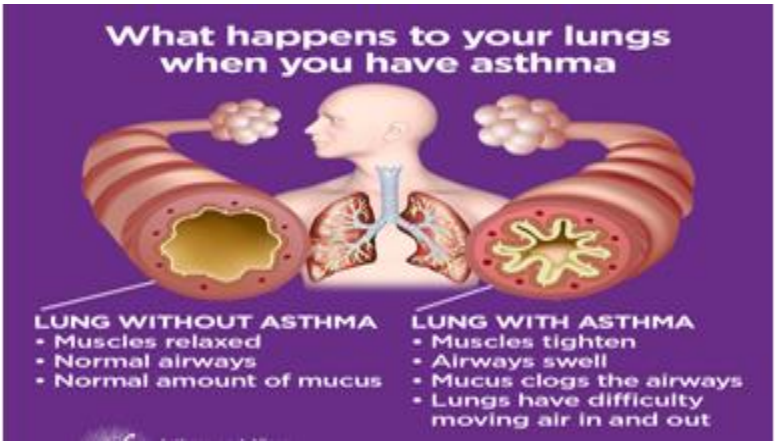


Figure.3.4.Effect of asthma on lung

Signs and Symptoms of asthma

- Wheezing or whistling sound during breathing
- Shortness of breath and chest tightness
- Coughing, especially at night or early morning
- Rapid breathing
- Increased heart rate

Management of asthma

- Stay calm and reassure the person with asthma.
- Help them sit upright and encourage them to take slow, deep breaths.

Figure.3.5. upright sitting position

- If the person has a prescribed inhaler, assist them in using it as directed.

Figure: 3.6. How to use inhaler

- Asthma patient taking medication using an inhaler
- If the symptoms worsen or do not improve after using the inhaler, call for emergency medical assistance.
- Avoid triggers such as smoke, strong odors, or known allergens.

3.3.2. Allergic Reaction (Anaphylaxis)

Definition

Anaphylaxis is a severe and potentially life-threatening allergic reaction that can occur rapidly after exposure to an allergen.

Signs and Symptoms

- Difficulty breathing or swallowing
- Swelling of the face, lips, tongue, or throat.
- Hives or widespread itching
- Rapid heartbeat
- Dizziness or loss of consciousness

Management:

- Call for emergency medical assistance immediately.
- If the person has an epinephrine auto-injector (EpiPen), help them use it as instructed.
- Assist the person in finding a comfortable position (usually sitting up) to help with breathing.
- If the person becomes unresponsive and stops breathing, perform CPR until medical help arrives.

Performing CPR (Cardio Pulmonary Resuscitation)

Cardiopulmonary resuscitation is an emergency treatment used to physically pump blood back into a person's heart when it has stopped beating or is not doing a good job of circulating it. Rescue breaths, also known as mouth-to-mouth or mouth-to-mask ventilation, are combined with chest compressions.

What are the CPR Steps?

Steps to perform Cardiopulmonary resuscitation

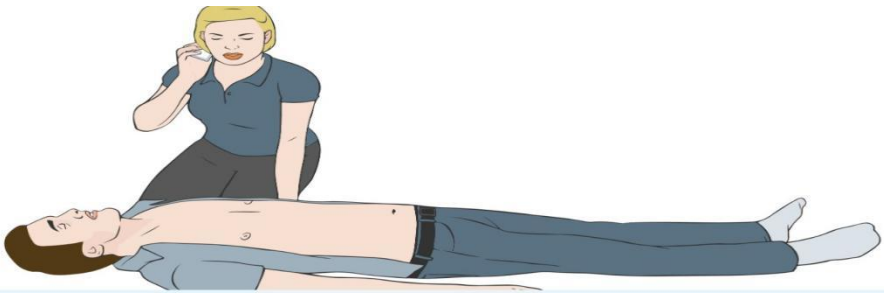
Cardiopulmonary resuscitation facilitates an efficient cardiac emergency response, potentially saving lives, according to the American Heart Association handbook.

Step-one

Check for responsiveness: Shake the person gently and ask loudly, "Are you okay?" Look for any signs of movement or responsiveness.

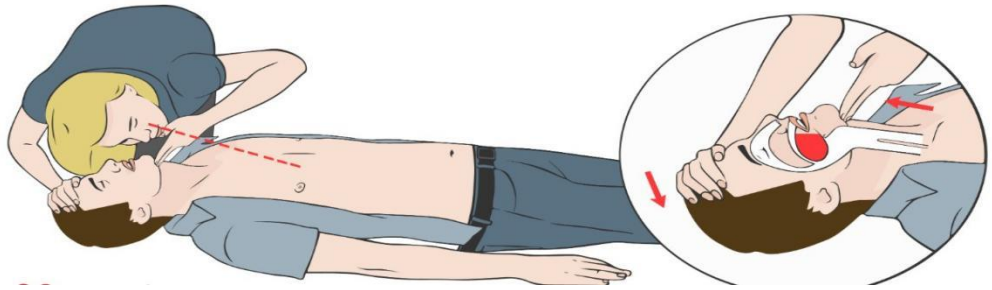
Step-two

Call for help: If the person does not respond, immediately call for emergency medical assistance or ask someone nearby to call.



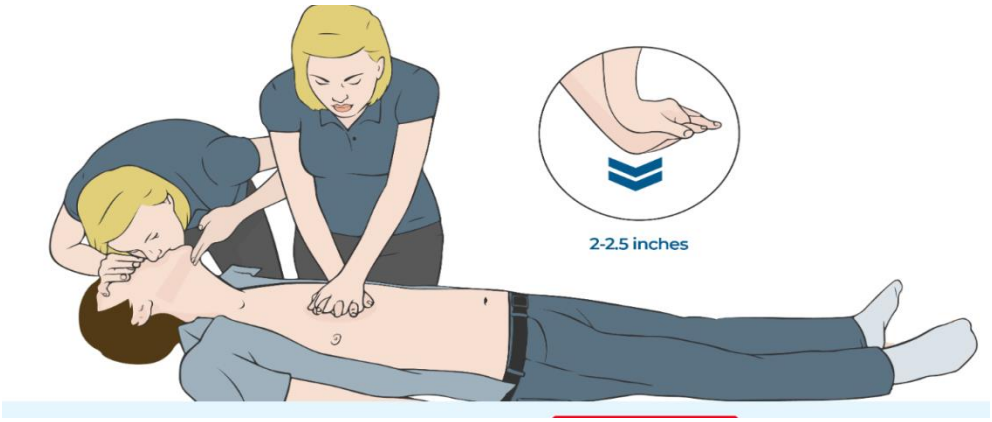
Step-three

Open the airway: Tilt the person's head back gently and lift the chin to open the airway. Look, listen, and feel for any signs of breathing for no more than 10 seconds.



Step-Four

Give rescue breaths: Pinch the person's nose shut, place your mouth over their mouth to create a seal, and give two rescue breaths. Each breath should last about one second and make the chest rise visibly.



Step-five

Perform chest compressions: Place the heel of one hand on the center of the person's chest (between the nipples) and place the other hand on top. Lock your elbows and position your shoulders directly above your hands. Push hard and fast, aiming for a depth of about 2 inches (5 centimeters) and a rate of at least 100 compressions per minute. Allow the chest to fully recoil between compressions

Step Six

Continue cycles of compressions and breaths: Perform 30 chest compressions, then give two rescue breaths. Continue this cycle until help arrives, an AED (Automated External Defibrillator) is available, or the person shows signs of life.

Overview of Automated External Defibrillators (AEDs)

- An AED is a portable electronic device that is used to shock the heart with electricity in the event of sudden cardiac arrest. Its goal is to bring the heart back to a normal rhythm.
- AEDs are designed to be user-friendly and can be used by individuals with minimal or no medical training.
- The heart's rhythm is evaluated by AEDs to see if an electric shock is required.
- AEDs can be found in public places and are usually carried by emergency medical services. They provide the user with visual cues and audio instructions.

Usage of AED in Emergency Medical Assistance:

- Use AED in conjunction with CPR.
- Obtain and turn on AED after CPR.
- Attach pads to person's bare chest.
- AED analyzes heart rhythm and determines need for shock.
- If advised, deliver shock by pressing appropriate button.
- AEDs are safe and effective, providing clear instructions.

Step-Seven

Put the victim in Recovery Position: To put the victim in recovery position, kneel on the side of the victim. Extend the arm closest to you at a right angle to their body, with their palm facing up. Take the other arm of the victim and fold it, so the back of the hand rests on the cheek nearest to you and hold it in place. Monitor the breathing until emergency medical services arrive to provide advanced life support.

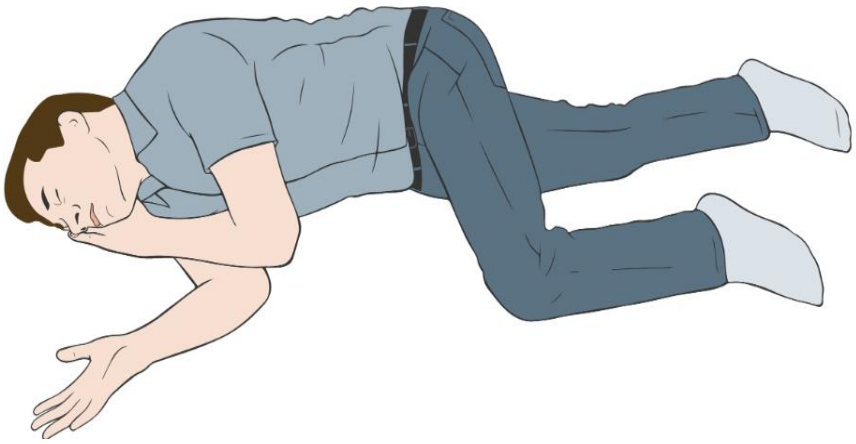


Figure 3.7.Steps of Cardiopulmonary resuscitation

3.3.3. Choking

Definition

Choking occurs when the airway is blocked, either partially or completely, restricting airflow.

What kinds of things can block an airway?

Food is one of the most common causes of choking in adults. An unconscious person can even choke on their own tongue or dentures.

Signs and Symptoms

- Clutching the throat or neck area

Figure 3.8: Signs and Symptoms of chocking

- Inability to speak or cough forcefully
- Wheezing or high-pitched sounds while breathing
- Turning blue or pale

Management of Chocking

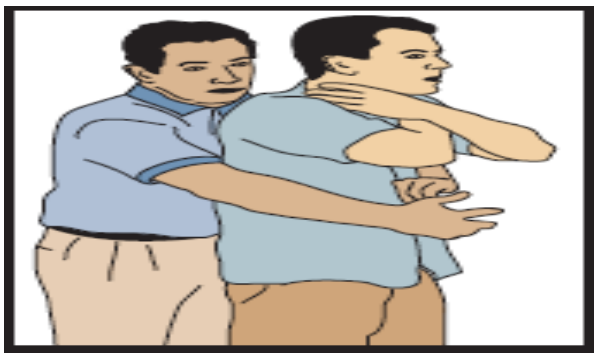
- Encourage the person to cough forcefully to try to dislodge the object.
- If the person cannot cough or breathe, perform the Heimlich maneuver.

Applying Heimlich maneuver

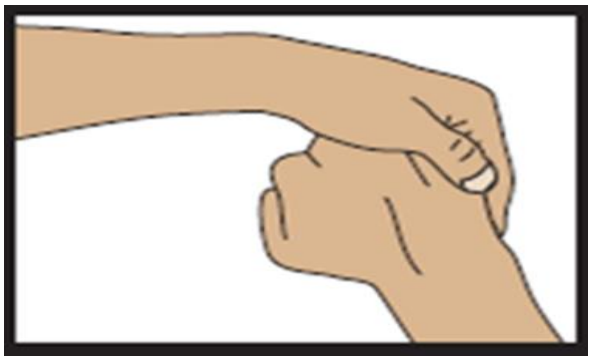
The Heimlich maneuver (Hime-likmuh-new-ver) is a physical act used to help a person who is choking because something is blocking their airway. The airway includes the nose, mouth, throat, larynx (voice box), and the trachea (breathing tube).

Steps for Heimlich maneuver

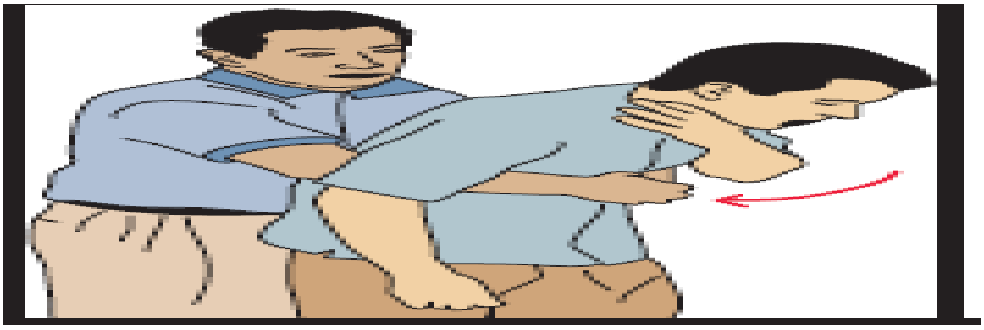
1. Stand behind victim with arms wrapped around waist, as shown in the figure below
2. Lock hands into a fist
3. Place the thumb side of fist against victim's abdomen, below rib cage, just above the navel



Step-1



Step-2



Step-3

Step-4: If the person becomes unresponsive, lower them gently to the ground and begin Cardiopulmonary resuscitation, starting with chest compressions based on the information stated above on Cardiopulmonary resuscitation.

Figure 3.9 Applying for Heimlich maneuver management for conscious person

Figure 3.10 Perform abdominal thrusts, on your self

Applying Heimlich maneuver for unconscious adult:

Figure 3.11 Applying Heimlich maneuver for unconscious adult

Figure 3.12. Applying Heimlich maneuver for pregnant women

The Heimlich maneuver may be modified for pregnant women and obese individuals, taking into account factors such as avoiding pressure on the uterus and applying pressure above the navel respectively. Prompt medical assistance should be sought even if the obstruction is cleared to ensure their well-being.

Child Choking Management:

- Assess the situation: Quickly determine if the child is experiencing a mild or severe choking episode.
- Mild choking: Encourage the child to continue coughing to dislodge the object.
- Severe choking: If the child is unable to cough, breathe, or speak, immediate action is required.
- For children over 1 year old: Stand or kneel behind the child, make a fist, and perform quick, upward abdominal thrusts

Figure 3.13 Applying Heimlich maneuver for over 1 year child

- For infants under 1 year old: Hold the infant face down, place their chest on your thigh or forearm, deliver firm back blows, turn the infant face-up, and give chest thrusts.

If the child becomes unconscious: Lower the child gently to the ground, activate emergency medical services, and begin CPR. Follow the steps for Adult CPR and the technique to perform chest compression for infant use the following picture

Figure 3.14 Applying Heimlich maneuver for less than one year infant

Remember, the most important aspect of managing choking in children is to act quickly and seek medical help if needed

N.B. It's important for high school students to have basic knowledge of these emergency situations and their management. However, it is crucial to involve trained medical professionals as soon as possible in any acute respiratory problem. The high school students should prioritize calling for emergency medical assistance and providing immediate assistance within their scope of training until professional help arrives.

Self-check questions 3.3

1. What is asthma?
2. What should you do if someone is experiencing an asthma attack?
3. What is choking?
4. What should you do if someone is choking and conscious?
5. What is CPR?
6. What are the steps for performing the Heimlich maneuver on a conscious choking adult or child?
7. What are the steps for performing the Heimlich maneuver on an unconscious choking adult or child?

3.4 Acute Circulatory Diseases

3.4.1 Cardiac Arrest

Definition

- Sudden loss of heart function, causing the heart to stop pumping blood.

Signs and Symptoms

- Sudden loss of consciousness and responsiveness.
- Absence of pulse or no signs of breathing.
- Pale or bluish skin color.

Management

- Call emergency medical services immediately.
- Perform cardiopulmonary resuscitation by providing chest compressions and rescue breaths.
- Use an automated external defibrillator (AED) if available.

3.4.2. Heart Attack (Myocardial Infarction)

Definition: blockage of blood flow to the heart muscle, leading to tissue damage.

Signs and Symptoms

- Chest pain or discomfort, often radiating to the arm, jaw, or back.
- Shortness of breath.
- Nausea, vomiting, or cold sweats.

Management

- Call emergency medical services immediately.
- Help the person take prescribed medications like aspirin or nitroglycerin, if available.
- Keep the person calm and reassure them while waiting for medical assistance.

3.4.3. Stroke (Cerebro vascular Accident)

Definition

Stroke is the interruption of blood supply to the brain, resulting in brain cell damage.

Signs and Symptoms

- Sudden numbness or weakness, especially on one side of the body.
- Difficulty speaking or understanding speech.

- Sudden severe headache, dizziness, or loss of balance.

Management

- Call emergency medical services immediately.
- Keep the person calm and in a comfortable position.
- Do not give them anything to eat or drink.

N.B. Note the time of symptom onset, as it is crucial for medical evaluation.

Self-Check questions 3.4.1-3.4.3

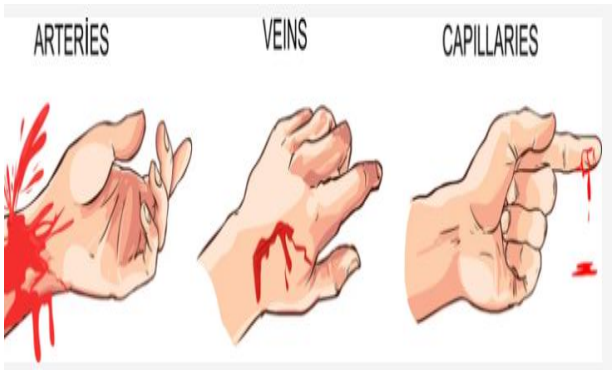
1. What is cardiac arrest?
2. What should you do if someone experiences cardiac arrest?
3. What is a heart attack (myocardial infarction)?
4. What are the common symptoms of a heart attack?
3. What should you do if someone is experiencing symptoms of a heart attack?
4. What is a stroke (cerebrovascular accident)?
5. What are the common signs of a stroke?

3.4.4. Severe Bleeding

Definition

Sever bleeding is excessive loss of blood from an injury or internal source. Based on skin broken bleeding can be external bleeding or internal bleeding.

External bleeding: As the name indicates it bleeds externally.



a. Bleeding from different vessels

b. Excessive bleeding

Figure 3.15. external bleeding

Signs and Symptoms

- Profuse bleeding from a wound or injury.
- Rapid heartbeat and breathing.
- Weakness, pale skin, and dizziness.

Management

- Apply direct pressure to the bleeding site using a sterile cloth or bandage.

- Elevate the injured area, if possible.

Apply Tourniquet:

- Tourniquet is a device used to stop severe bleeding.
- It is best to avoid a tourniquet and use it only as the last choice to bleeding.
- There is always a risk that the tourniquet may compromise the distal circulation of blood leading to gas gangrene (**tissue death**) of the limb. If a tourniquet has to be used then the following must be kept in mind:

- The tourniquet should be at least two inches wide.
- If a proper tourniquet is not available, one can easily use a towel or **handkerchief** as a substitute.
- It should be placed above the edge of the wound, close to it.
- Don, t wrap so tightly that it creates a tourniquet effect.
- Tourniquet-The use of a tourniquet is dangerous and the tourniquet should be used only for a severe life-threatening haemorrhage that cannot be controlled by other means.

Procedure to apply tourniquet

- Apply pad over the artery to be compressed
- Place the tourniquet above the wound
- Warp it and make a half knot
- Place a small stick over the knot
- Twist the stick until the bleeding stop
- Secure the stick with the loosen part of the tourniquet
- Make a written note about the site and time of application
- Don't cover the tourniquet
- Call emergency medical services immediately.
- Keep the person lying down and calm.

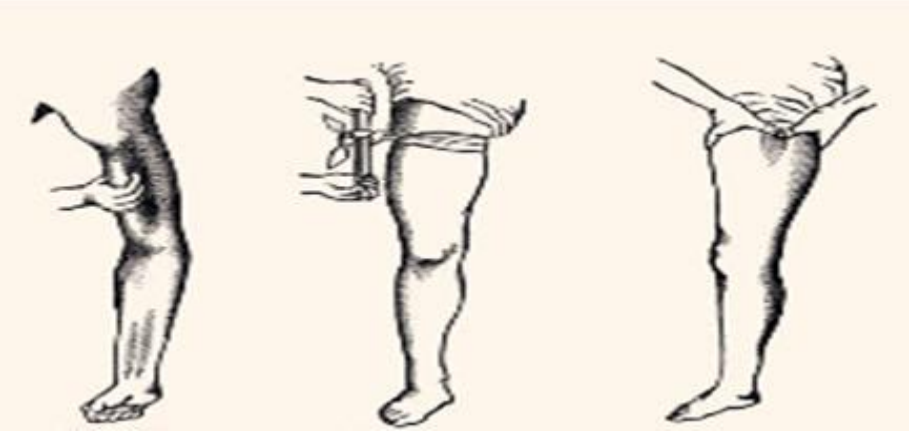


Figure 3.16. a.Managing bleeding

Figure 3.16.b. Managing bleeding

Internal Bleeding

Definition: Internal bleeding is when blood leaks inside the body.

Signs and Symptoms: Bruising, pain, shock symptoms, blood in urine/stool, mental changes.

First Aid Management: Call emergency services, keep the person calm and still, maintain body temperature, don't give food or drink, monitor vital signs. Remember, seek immediate medical help.

Self-check questions 3.4.4

1. What is internal bleeding?
2. What are the signs and symptoms of internal bleeding?
3. How should you manage a suspected case of internal bleeding?

3. If you suspect internal bleeding, it is crucial to seek immediate medical attention. While waiting for medical help, keep the person still and calm, maintain their body temperature, and do not offer them anything to eat or drink.

4. What is external bleeding?
5. What are the signs and symptoms of external bleeding?
6. How should you manage external bleeding?

3.4.5. Shock

A. Definition

Shock is a lack of blood flow to the body can cause shock, a potentially fatal condition. When there is insufficient blood flow, cells and organs do not receive enough nutrients and oxygen to function correctly. This can lead to harm to numerous organs. Shock can quickly worsen and has to be treated right away. Up to 1 in 5 shock patients will pass away as a result of it.

Signs and Symptoms

- Rapid and weak pulse.
- Cold, clammy skin.
- Confusion, restlessness, or decreased level of consciousness.

Management

- Call emergency medical services immediately.
- Place the victim in shock position
- Keep the person worm and comfortable
- Turn the victim‘s head to one side if neck injury is not suspected
- Help the person lie down in a flat position with raised legs, if possible.
- Maintain their body temperature and provide reassurance.
- Do not give them anything to eat or drink.

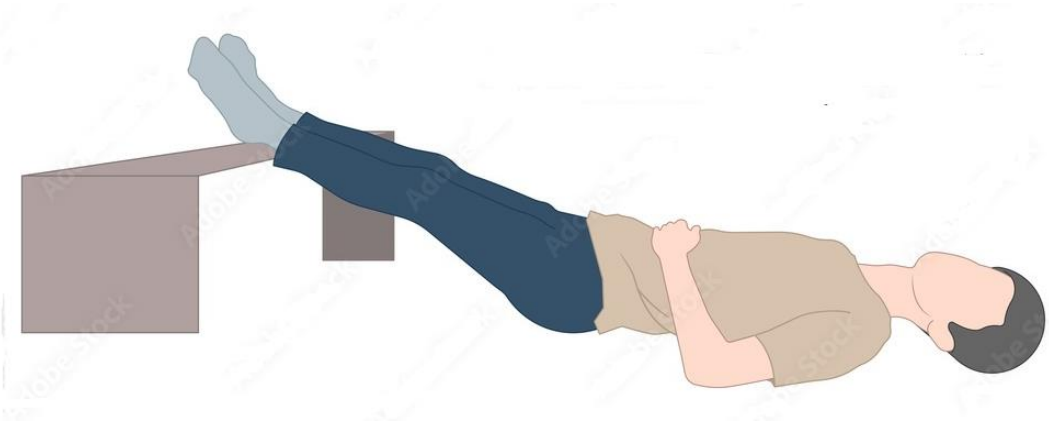


Figure 3.17. Managing shock

3. 5. Musculoskeletal Injury

Musculoskeletal problems refer to a wide range of conditions and injuries that affect the bones, muscles, joints, ligaments, tendons, and other structures of the musculoskeletal system.

3.5.1. Bone and joint injury

3.5.1.1. Sprain**:**

Definition:

A sprain occur when the ligaments that connect bones within a joint are stretched or torn, typically due to a sudden twist or wrenching motion.

Signs and Symptoms

- Pain, tenderness, and swelling around the affected joint.
- Restricted range of motion.
- Bruising or discoloration around the joint.
- Instability or a feeling of "giving way" in the joint.
- Possible popping or tearing sound at the time of injury

Figures 3.18. Sign and symptoms of sprain

First Aid Management

- Encourage the person to rest the injured joint and avoid putting weight on it.
- Apply ice to the affected area for 15-20 minutes at a time, several times a day, to help reduce pain and swelling.
- Compression can be applied using an elastic bandage to help control swelling

Figure 3.19. Cold application

3.5.1.2. Fracture

Definition

A fracture involves a break or crack in a bone. Fractures can be classified as closed (simple) fractures, where the skin remains intact, or open (compound) fractures, where the fractured bone Pierces the skin.

Figure 3.20: Fracture of tibia and fibula bones

Signs and Symptoms

- Intense pain at the site of the injury.
- Swelling, bruising, and tenderness around the fractured area.
- Deformity or an abnormal appearance of the affected limb.
- Inability to bear weight or use the injured limb.
- Possible crepitate (make a grating or cracking sound) when the broken ends of the bone rub against each other.

First Aid Management

- Stabilize the injured limb and encourage the person to avoid moving it to prevent further damage.
- If an open fracture is present, cover the wound with a sterile dressing or clean cloth to prevent infection.

- Apply ice to the area if there is swelling, but be cautious not to apply ice directly on the skin.
- Support the injured limb with a splint or immobilization device to prevent further injury during transportation.
- Encourage the person to seek immediate medical attention for proper evaluation, diagnosis, and treatment

Figure 3.21.First Aid management for fracture of bone

3.5.1.3. Strain

Definition

A strain refers to the stretching or tearing of a muscle or tendon. It often occurs due to overuse, repetitive movements, or sudden forceful exertion.

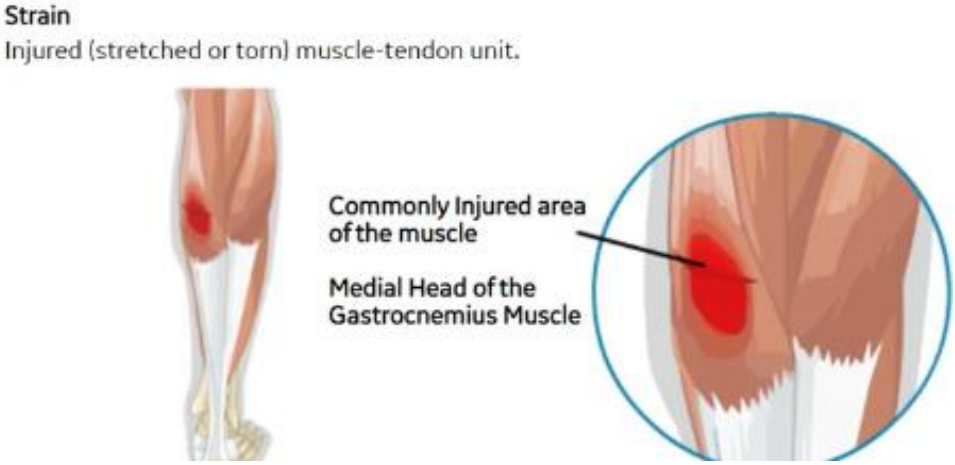


Figure 3.22. Injury of muscles

Signs and Symptoms

- Pain, tenderness, and swelling in the affected muscle or tendon.
- Limited range of motion and difficulty moving the affected body part.

- Muscle spasms or cramping.
- Weakness in the affected area.
- Possible bruising or discoloration.

First Aid Management

- Encourage the person to rest the strained muscle or tendon and avoid activities that exacerbate the pain.
- Apply ice to the area for 15-20 minutes at a time, several times a day, to help reduce pain and swelling.
- Compression with an elastic bandage can be applied to control swelling.
- Advise the person to elevate the injured limb, if applicable, to further reduce swelling.
- Recommend over-the-counter pain relievers, if appropriate, to alleviate pain and inflammation.
- Suggest seeking medical attention if the pain is severe, there is significant swelling, or if the person is unable to bear weight or use the affected limb.

N.B. Grade 11 Community health service students have to understand and recognize the signs and symptoms of sprains, fractures, and strains, as well as provide appropriate first aid management. However, it's important to note that these measures are initial steps and individuals should seek professional medical evaluation and treatment for a comprehensive assessment and further management.

3.5.1.4 Dislocation

Definition

Dislocation refers to the displacement of bones at a joint, causing the articulating surfaces to separate and lose their normal alignment. It is musculoskeletal problem that can occur when the bones in a joint are forced out of their normal position.

Signs and Symptoms

- Severe pain in the affected joint.
- Swelling, bruising, and tenderness around the joint.
- Visible deformity or abnormal positioning of the joint.

- Limited or complete loss of joint movement.
- Numbness or tingling in the area distal to the dislocation (if nerves are affected).

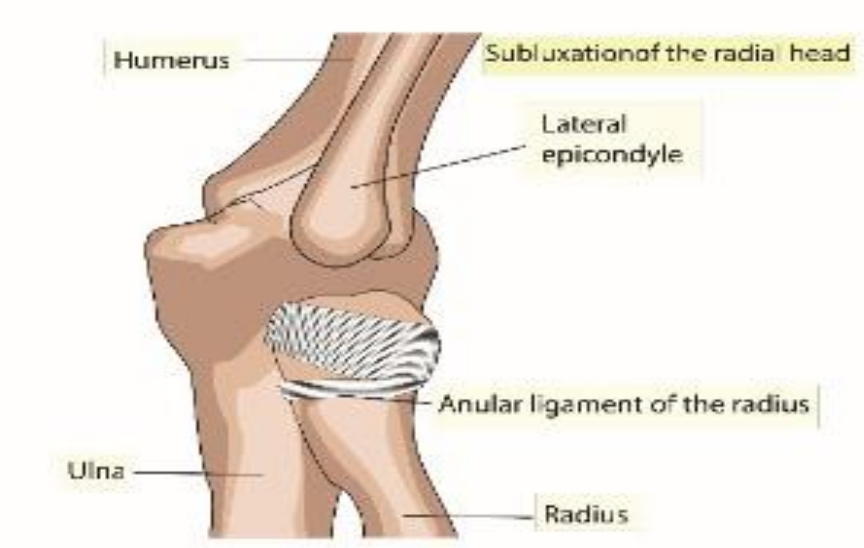


Figure 3.23: Dislocation of joint

Note: Dislocations require prompt medical attention. The following first aid measures are aimed

C. First Aid Management

- Encourage the person to remain still and avoid moving the injured joint.
- Support the injured limb in the position found, as long as it does not cause further pain or discomfort.
- Apply ice wrapped in a cloth to the affected area to help reduce pain and swelling.
- Immobilize the joint using a splint or improvised materials (such as a rolled-up newspaper or rigid object) to prevent further movement.
- Advise against attempting to relocate the dislocated joint as this should be done by a healthcare professional.
- Elevate the injured limb, if possible, to reduce swelling.
- Provide pain relief, if appropriate, with over-the-counter medications under medical guidance.

N.B It is crucial to emphasize that dislocations should be evaluated and treated by a healthcare professional as soon as possible. They will assess the injury, administer appropriate pain management, and perform techniques to relocate the dislocated joint safely. Delayed or improper treatment of dislocations can lead to complications, such as damage to surrounding structures or impaired joint function.

3.5.1.5. Head Injury

Definition

A skull fracture refers to a break or crack in one of the bones that make up the skull. The skull's primary function is to protect the brain, and any damage to it can potentially lead to severe complications.

Signs and Symptoms

- A significant blow or trauma to the head often precedes a skull fracture. This can occur due to accidents, falls, or sports-related incidents.
- The affected area may be tender to touch, and you may experience localized swelling or a visible deformity.
- If the fracture involves damage to blood vessels, bleeding from the nose, ears, or wounds on the scalp may occur.
- The presence of bruising around the eyes or behind the ears, known as raccoon eyes or Battle's sign, respectively, can be indicative of a skull fracture.
- Loss of consciousness, confusion, dizziness, irritability, difficulty remembering, or changes in behavior can be warning signs.

First Aid Management

If you suspect someone has a skull fracture, it is crucial to take immediate action while awaiting medical help. Follow these steps:

- Dial emergency services or ask someone nearby to do so.
- Make sure the person is in a safe position, avoiding any further injury.

- To prevent any unnecessary movement, support the head and neck by placing your hands on both sides of the person's head.
- If there is bleeding, apply gentle pressure using a clean cloth or sterile dressing. Avoid
- Pressing directly on the wound.
- If any object is lodged in the wound, do not try to remove it. Stabilize the object and wait for medical professionals to handle it.
- Observe the person's breathing and pulse while providing reassurance and comfort.

Figure 3.24. First Aid management of different parts of head injury

3.5.1.6. Spine Injury

Definition

A spine injury refers to damage or trauma to the spinal cord, vertebrae, or surrounding tissues. The spine plays a crucial role in supporting the body and facilitating the transmission of messages between the brain and the rest of the body. Injuries to the spine can have severe consequences on bodily functions and mobility.

Signs and Symptoms

- Pain or Tenderness: Persistent or intense pain in the neck, back, or affected area.
- Loss of Sensation: Numbness or tingling in the limbs (arms, legs) or other body parts.
- Muscle Weakness or Paralysis: Difficulty moving limbs, weak muscles, or complete loss of sensation and movement in certain areas.
- Breathing Difficulties: Impaired breathing, shortness of breath, or shallow breathing.
- Altered Sensation: Inability to feel heat, cold, or touch in specific regions of the body.

- Loss of Bladder or Bowel Control: Incontinence or the inability to control urination or bowel movements.

First Aid Management

If you encounter someone with a suspected spine injury, follow these crucial steps while waiting for professional medical assistance:

- Dial the appropriate emergency number immediately, providing accurate details of the
- incident and the injured person's condition.
- Keep the injured person as still as possible to prevent further damage. Do not attempt to move them unless necessary to avoid immediate danger.
- Stabilize the head and neck in a neutral position by placing your hands on both sides of the head. This helps to minimize movement and potential harm to the spinal cord.
- Clear the airway and ensure the person can breathe freely. If necessary, perform CPR if the injured person stops breathing and has no pulse.
- Observe their breathing, pulse, and level of consciousness. Provide reassurance and comfort while waiting for medical professionals to arrive.

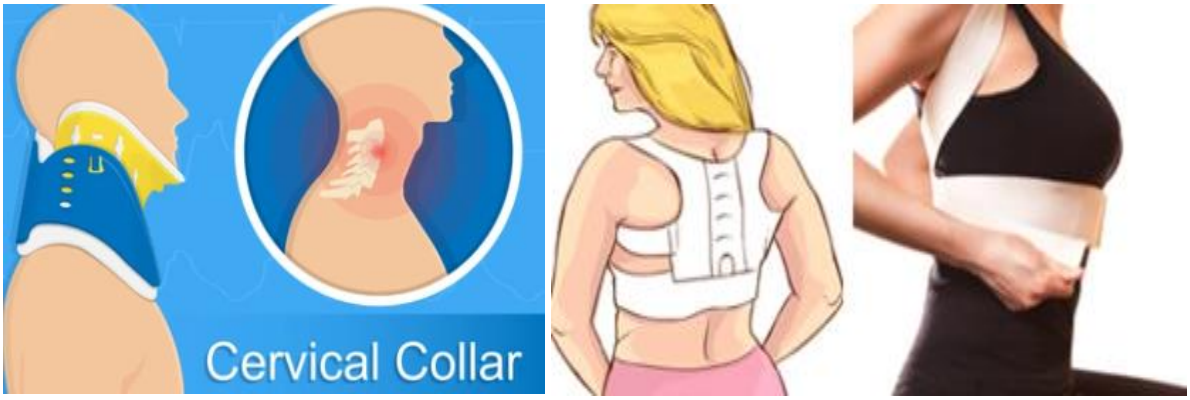


Figure 3.25. Spinal cord Injury support

Bandage

Is a strip of woven material which used to hold dressing in place

Purpose of Bandage

- To hold dressing in place
- To fix or hold splint in position
- To support the injured part
- To reduce or prevent edema

Types of bandages are

- Elastic Bandage: stretchable and reusable
- Gauze Bandage- shouldn't be wet during use
- Triangular bandage- **u**se for arm injury

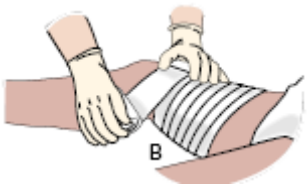
Type of bandage turn

Circular turn

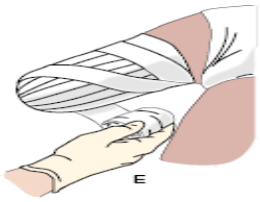
- There is a complete overlap of the pervious turn
- Apply for small part the body like finger

Spiral Turn

- Applied over cylindrical body part
- It has from half to two third of overlap. E.g. extremities



Recurrent turn- Apply for amputation



4. Eight Turn - Apply to immobilize joint

Figures 3.26: Type of bandage turn

- Elevate the injured limb above the level of the heart, if possible, to further reduce swelling.
- Advise the person to seek medical attention if the pain is severe, there is significant swelling, or if they have difficulty bearing weight on the injured limb.

Arm Siling

Arm siling is an intervention Used to immobilize fractured arm

Procedure:

- Use triangular bandage
- Place one end over affected shoulder let the other end parallel to anterior chest
- Carry out the point behind the affected elbow
- Bring the other end over the affected shoulder and tie at the side
- Make sure that finger are expose

Figure 3.27: Arm sling

Caution of bandage application

- Bandage shouldn't be too loose or too tight
- Finger should be exposed
- Watch any change like edema

Loosen bandage if there is numbness

Self-check questions 3.5.1

1. What is a fracture?
2. What are the common signs and symptoms of a fracture?
3. How should you manage a suspected fracture?
4. What is a sprain?
5. What are the common signs and symptoms of a sprain?
6. How should you manage a suspected sprain?
7. What is a dislocation?
8. What are the common signs and symptoms of a dislocation?
9. How should you manage a suspected dislocation?
10. When should you seek medical attention for a bone or joint injury?

3.6. Other Emergency conditions

3.6.1. Seizures

Definition:

Seizures are abnormal electrical activity in the brain, leading to sudden changes in behavior, movements, or consciousness.

Signs and Symptoms

- Loss of consciousness or altered awareness.
- Uncontrolled movements, such as convulsions or jerking.
- Drooling, biting the tongue, or loss of bladder or bowel control.

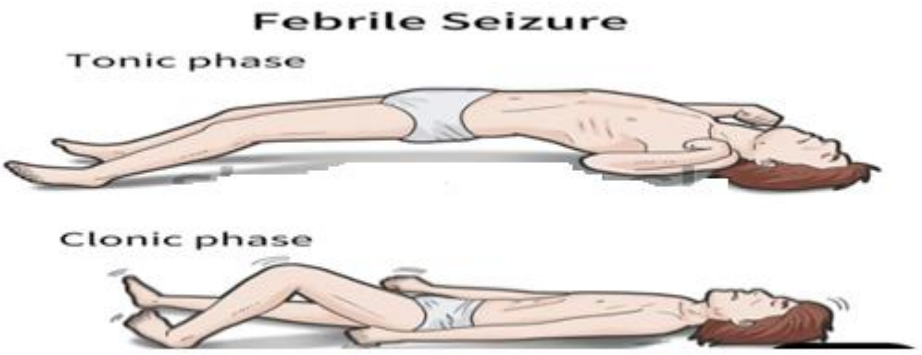


Figure 3.28. Phases of seizure

First Aid Management:

- Clear the area of any objects that could cause injury.
- Protect the person by cushioning their head and removing any tight clothing around the neck.
- Do not restrain the person or put anything in their mouth.
- After the seizure, help them into a safe position and offer reassurance.

3.6.2. Burns

Definition

Burn is damage to the skin or underlying tissues caused by heat, chemicals, electricity, or radiation. Burns are classified as first-, second-, or third-degree, depending on how deep and severe they penetrate the skin's surface.

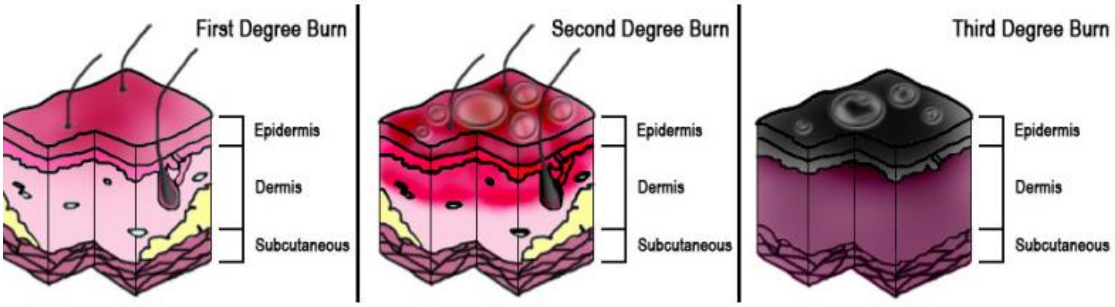


Figure 3. 29: Different degrees of burn

1. **First-degree (superficial) burns**

First-degree burns affect only the epidermis, or outer layer of skin. The burn site is red, painful, dry, and with no blisters. Mild sunburn is an example. Long-term tissue damage is rare and usually consists of an increase or decrease in the skin color.

Figure 3. 30. First degree burn

2. **Second-degree -(partial thickness) burns**

Second-degree burns involve the epidermis and part of the dermis layer of skin. The burn site appears red, blistered, and may be swollen and painful.

Figure 3. 31. Second degree burn

3. **Third-degree (full thickness) burns**

Third-degree burns destroy the epidermis and dermis. Third-degree burns may also damage the underlying bones, muscles, and tendons. The burn site appears white or charred. There is no sensation in the area since the nerve endings are destroyed.

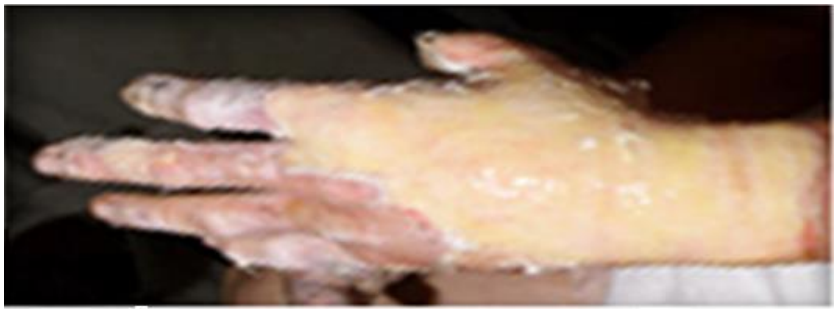


Figure 3.32.Third degrees burn

N.B. Burns affecting 10 percent of a child's body and those affecting 15 to 20 percent of an adult's body are considered to be major injuries and require hospitalization and extensive rehabilitation.

Signs and Symptoms

- Redness, blistering, or charred skin.
- Severe pain or no pain if nerve endings are damaged.
- Swelling or difficulty moving the affected area.

First Aid Management

- Remove the person from the source of the burn and cool the affected area with cool running water for at least 10 minutes.

Figure 3.33: Cooling first degree burn

- Cover the burn loosely with a sterile non-stick dressing or clean cloth.
- If the burn is severe or covers a large area, call emergency services.

3.6.2.1. Different types of burn

Chemical burns

Chemical burns require immediate care since the longer the chemical in contact with the body the greater the potential for injury.

Management of chemical burn

- Protect yourself from being involved in the accident
- Wear gloves and eye protection or fluid proof dressings
- Dry chemicals: brush before gone to any other procedure, then flush with tepid water
- Wet chemicals: flush with copious/high amount of fluid at least for 10-20 minutes.
- Minimize further body contamination by making sure that fluid runs away from the injury and not toward uninjured part.

Electric burns

- Electric burns cause severe damage to the whole body.
- Electric injury will always seek to flow to the ground, as the energy enters the body it will seek the path of least resistance to exit the body.
- All tissues between the entrance and the exit will potentially be injured due to the extreme heat generated by the resistance of the body to the electricity.
- The heart produces its own electrical energy from chemical reactions and it may disturb the function of the heart and result in arrhythmia or cardiac arrest.

Management of Electric burns

- Never attempt to remove the patient from the electric source
- Try to shut down or off the electric power from its main source.
- Never touch a patient that is in touch with the electric source.
- Provide oxygen

Monitor the victim for cardiac arrest, prepare to administer Cardiopulmonary resuscitation

- Check spinal cord injury
- Refer the victim as soon as possible, though there may not be any visible signs of severe injury.

- Electric burns have a slow onset and gradual organ damage.

General Management of heat Burn

- Remove the patient from the source of the burn
- Stop burning process, remove burnt clothes and flush with tepid water
- Establish and maintain an open-air way
- If breathing is inadequate provide artificial breathing support or oxygen therapy
- Estimate the involved body surface area, using the rule of nine
- Determine the depth of the burn, superficial, partial, or full thickness
- Apply sterile dressings and bandages or burn sheet
- Maintain body temperature
- Do not use oils to stop burning process as oil has a capacity to hold heat
- Do not use ice water to stop burn process as it may result in hypothermia
- Manage other associated injuries

3.6.2.2. Effect of Burn On Different Systems Of The Body

Circulatory system

- Burn injury causes extreme fluid loss and it results over load to the heart
- Burns increase the capillary permeability or the ability of fluid to exit the vessels.
- Fluid will also leak from the damaged tissues to areas in between the cells and it causes edema or swelling, which will be double in the next 24 hours.
- All these fluid losses will result in shock, hypoperfusion.
- Hence major burns require great amount of fluid replacement.

Respiratory system

- Swelling on the face or the neck due to burn on the areas may cause air way closure.
- Inhalation of overheated air may also cause laryngeal swelling which will lead to accumulation of fluid in the lungs.

- Smoke inhalation may cause toxic gas poisonings.
- Circumferential burn to the chest restricts breathing movement.

Renal system

- The decreased blood flow due to the lost fluid will result in decreased blood flow to the kidneys; this result in decreased kidney output may result in pre-renal failure.
- The cell distraction resulted from the burn injury will form many wastes in the blood, the kidneys are responsible to filter this blood,
- Filtering such blood results in blockage of the kidney or may result in intrinsic renal failure.

Nervous system

- Burns may cause nerve damages and will result in loss of functioning to the inured area, long term muscle wasting, joint dysfunction because of scaring.
- Such patients, who are in crises, need not only medically care but also psychological help.

Gastrointestinal system

- As there is low amount of blood the blood will re-routed from this system to other parts of the body.
- The existing nausea and vomiting cause an upset and chemical imbalance.
- The long-term exposure to such stress result in development of ulcer called curling ulcer.
- Hence the gastrointestinal system should also be considered in the treatment of burn by providing antacids.

Complications of burn

- Loss of great amount of fluid leads to shock and renal failure
- Infection
- Development of tetanus
- Contractures and deformities
- Asphyxia in case of inhalation injury

- Coexisting injuries, fractures, amputation
- Development of stress ulcer (Curling Ulcer)

3.6.3. Insect Bite

Definition:

Is the bites from insects such as mosquitoes, flies, or fleas.

Signs and Symptoms

- Redness, itching, and swelling at the site of the bite.
- Small raised bumps or blisters.

First Aid Management

- Wash the area with soap and water to reduce the risk of infection.
- Apply a cold compress or ice pack to reduce itching and swelling.
- Use over-the-counter anti-itch creams or antihistamines for relief.
- Avoid scratching to prevent secondary infection.

3.6.4. Dog or Animal Bites

Definition:

Are bites from dogs, cats, or other animals.

Signs and Symptoms

- Puncture wounds or lacerations.
- Swelling, redness, and pain at the site of the bite.
- Risk of infection.

First Aid Management

- Wash the wound thoroughly with soap and running water.
- Apply direct pressure with a clean cloth or sterile bandage to control bleeding.
- Elevate the injured area if possible.
- Seek medical attention, as animal bites may require antibiotics or a tetanus shot.

3.6.5 Snake Bites

Definition:

Are bites from venomous snakes.

Signs and Symptoms

- Two puncture marks at the site of the bite.
- Severe pain, swelling, and redness around the bite area.
- Nausea, vomiting, dizziness, or difficulty breathing.

First Aid Management

- Keep the person calm and immobile to slow the spread of venom.
- Remove any constricting clothing or jewelry near the bite area.
- Position the bitten limb at or below heart level.
- Call emergency services and seek immediate medical attention.

3.6.6. Poisoning

Definition:

It is a condition occurs when a person is exposed to a harmful substance that can cause injury or illness when ingested, inhaled, absorbed through the skin, or injected. Poisons enter the body either accidentally or intentionally through the following routes:

- Poisoning by **ingestion** → swallowing
  Cause guts poisoning e.g. food, drug, plant, gasoline, insecticide, pesticides, and detergents
- Poisoning by **inhalation** Gaseous poisoning e.g. carbon monoxide, refrigerator gases, chlorine gases
- Poisoning **through skin** and mucus membrane contact. Causes skin poisoning e.g. caustic chemicals

Types of poisons: there are many substances which can poison human being. The common source of poising includes: Acids, insecticides, alkalis, drugs given for allergy, aspirin over dose in children, sleeping pills (sedatives), iron, mercury, lead and paraffin, petrol.

Signs and Symptoms

- Nausea, vomiting, or diarrhea.
- Abdominal pain or cramps.
- Dizziness or lightheadedness.
- Difficulty breathing or swallowing.
- Changes in skin color or appearance.
- Altered mental state or confusion.

First Aid Management

- Assess the situation and ensure your safety before helping the affected person. If necessary, remove them from the source of poisoning to a safe area.
- Call emergency services or the appropriate poison control hotline for immediate assistance.
- Do not induce vomiting unless instructed to do so by medical professionals or poison control. Vomiting may be harmful depending on the substance ingested.
- If the poison is on the person's skin, remove contaminated clothing and rinse the affected area with copious amounts of water.
- Provide information about the poison to medical professionals, such as the type of substance and the amount ingested or exposed to, if known.

N.B. It is important to note that specific first aid measures for poisoning can vary based on the type and nature of the toxin involved. It is crucial to contact medical professionals or poison control for guidance tailored to the specific poisoning incident.

3.6.7. Epistaxis

Definition:

Epistaxis, commonly known as a nosebleed, is a condition characterized by bleeding from the nose. It occurs when blood vessels within the nasal cavity rupture, leading to blood flow from the nostrils.

Signs and Symptoms

- Blood dripping or flowing from one or both nostrils.
- A feeling of fluid running down the back of the throat (posterior nosebleed).
- Tasting blood in the mouth or throat.
- Presence of blood-soaked tissues or handkerchiefs.

Figure 3.34: Nose bleeding

- Mild to moderate discomfort or pain in the nasal area.
- Rarely, dizziness, lightheadedness, or fainting if there is significant blood loss

First Aid Management

- Stay calm and reassure the person experiencing the nosebleed.
- Assist the person to sit down and lean slightly forward to prevent blood from flowing down the throat.
- Encourage the person to breathe through their mouth to avoid swallowing blood.
- Instruct the person to pinch their nostrils together just below the bony part of the nose, applying gentle and constant pressure for about 10 to 15 minutes.

Figure 3.35: Pinching a nose while bleeding

- Advice the person to avoid tilting their head back, as this may cause blood to flow down the throat.

Figure 3.36: Applying cold compress while bleeding

- Apply a cold compress or ice pack wrapped in a cloth to the bridge of the nose to help constrict blood vessels and reduce bleeding.
- . After the bleeding stops, instruct the person to avoid blowing their nose forcefully for several hours to prevent re-bleeding.
- Educate the person on preventive measures, such as avoiding nose picking, keeping the nasal passages moist with saline nasal sprays, and using a humidifier to add moisture to the air.
- Advise seeking medical attention if the bleeding is severe, does not stop after 20 minutes of steady pressure, or if it is accompanied by severe pain, difficulty breathing, or other concerning symptoms.

3.6.8. Eye Injury

A. Definition

An eye injury refers to any damage or trauma that affects the eye or its surrounding structures, including the eyelids, cornea, iris, lens, or retina. It can range from minor scratches or foreign body entry to severe injuries that may result in vision loss.

B. Signs and Symptoms

The signs and symptoms of an eye injury can vary depending on the type and severity of the injury, but some common indications include:

- Pain or discomfort in the eye
- Redness or bloodshot appearance
- Swelling or bruising around the eye
- Tearing or watery eyes
- Blurred or decreased vision
- Sensitivity to light
- Foreign body sensation (feeling like something is in the eye)
- Inability to open or close the eye properly
- Blood in the white part of the eye (subconjunctival hemorrhage)
- Pupil irregularities or changes in the shape of the eye

C. First Aid Management

If someone sustains an eye injury, it is important to provide appropriate first aid while seeking professional medical help. Here are some general steps to follow:

1. Stay Calm: Reassure the person and keep them calm to prevent further injury caused by panic or movement.
2. Assess the Situation: Determine the nature and severity of the injury. Do not try to remove any embedded foreign objects.
3. Avoid Rubbing: Instruct the person not to rub or apply pressure to the injured eye, as it may worsen the damage.
4. Protect the Eye: If there is an object protruding from the eye, do not attempt to remove it.

Stabilize the object by placing a cup or similar protective covering over the eye and seek

immediate medical assistance.

5. Rinse the Eye: If there is a chemical or irritant in the eye, flush it with clean water. Tilt the person's head to the side, pull the lower eyelid down, and pour a gentle stream of water into the inner corner of the eye to wash out the substance. Avoid using any substances other than water unless instructed by medical professionals.
6. Cover the Eye: Place a sterile dressing or a clean cloth over the injured eye to protect it from further damage.
7. Seek Medical Attention: Even for seemingly minor injuries, it is advisable to seek prompt medical evaluation by an eye care professional. They will be able to assess the extent of the injury and provide appropriate treatment.

Self-Check questions 3.6

1. What is a sudden abnormal electrical activity in the brain that can cause convulsions and loss of consciousness?
2. What type of injury occurs when the skin or tissues are damaged by heat, chemicals, electricity, or radiation?
3. What is a common reaction to an insect's venom or saliva that causes redness, swelling, and itching?
4. What type of injury occurs when a dog bites and pierces the skin, potentially leading to infection and tissue damage?
5. What medical term is used to describe bleeding from the nose?
6. What type of injury affects the eye, potentially causing pain, vision problems, or damage to the eye structures?

Unit Summary

Understanding the respiratory system is crucial in first aid situations. The mouth and nose play a vital role in breathing, chewing food, and filtering the air. It is essential to maintain an unobstructed windpipe to ensure proper airflow. In terms of the circulatory system, the heart is responsible for pumping blood to and from the body's organs. Understanding the four chambers of the heart provides a foundation for comprehending how the circulatory system functions.

Different respiratory conditions require specific attention. Asthma involves inflammation and narrowing of the airways, while choking occurs when an object obstructs the throat, impeding breathing. Cardiac arrest is the sudden loss of heart function, and heart attacks happen when blood flow to the heart muscle is blocked. Strokes occur when blood flow to the brain is disrupted.

Recognizing the difference between internal and external bleeding is crucial. Internal bleeding may manifest as pain, dizziness, pale skin, or swelling, while external bleeding requires the application of direct pressure, elevation of the injured area, and maintaining pressure until the bleeding stops.

Managing injuries effectively is another important aspect of first aid. Fractures, sprains, and dislocations require immobilization, ice application, and seeking medical attention. Seizures, characterized by uncontrolled electrical disturbances in the brain, must be managed carefully. Anaphylaxis, a severe allergic reaction, demands immediate medical attention. Diabetes emergencies require checking blood sugar levels, providing sugar sources for low blood sugar, and seeking medical assistance.

In conclusion, understanding the respiratory and circulatory systems, recognizing different medical conditions, and knowing how to manage injuries and emergencies are vital in providing effective first aid. These skills can make a significant difference in saving lives and minimizing harm in critical situations.

Unit Review questions

1. Which of the following are signs and symptoms of a nosebleed (epistaxis)?
   A. Redness and swelling at the site of the bite
   B. Blood flowing from one or both nostrils
   C. Difficulty speaking or coughing
   D. Loss of consciousness
2. How should you position someone experiencing a nosebleed?
   A. Tilt their head backward
   B. Have them lie down flat
   C. Tilt their head forward
   D. Have them stand upright
3. What steps can you take to manage a nosebleed?
   A. Apply pressure to the back of the head
   B. Apply a warm compress to the nose
   C. Administer oral antihistamines
   D. Pinch the soft part of the nose with thumb and index finger
4. What are the common signs and symptoms of an insect bite?
   A. Tasting blood in the mouth
   B. Formation of a small blister or rash
   C. Difficulty breathing or speaking
   D. d loss of consciousness
5. How should you clean and treat an insect bite?
   A. Apply a warm compress to reduce swelling
   B. Scrub the bite vigorously with soap and water
   C. Apply over-the-counter hydrocortisone cream
   D. Take oral antihistamine immediately
6. What are some ways to reduce swelling associated with an insect bite?
   A. Apply a cold compress or ice pack
   B. Elevate the affected limb
   C. Take oral antihistamines
   D. Apply warm compress
7. What are the signs and symptoms of choking?
   A. Redness and swelling at the site of the bite
   B. Blood flowing from one or both nostrils
   C. Difficulty speaking or coughing
   D. Loss of consciousness

8. What are the recommended steps for assisting a conscious choking victim?
   A. Perform abdominal thrusts (Heimlich maneuver)
   B. Perform back blows between the shoulder blades
   C. Administer oral antihistamines
   D. Begin CPR immediately

9. How should you approach a choking situation with an unconscious victim?
   A. Call for emergency medical help immediately
   B. Begin CPR starting with chest compressions
   C. Perform abdominal thrusts (Heimlich maneuver)
   D. Administer oral antihistamines

10. What are the primary signs that indicate the need for CPR?
    A. Unresponsiveness and absence of normal breathing
    B. Redness and swelling at the site of the bite
    C. Difficulty speaking or coughing
    D. Loss of consciousness

11. What is the recommended ratio of chest compressions to rescue breaths in CPR?
    A. 15 chest compressions to 1 rescue breath
    B. 30 chest compressions to 2 rescue breaths
    C. chest compressions to 1 rescue breath
    D. 10 chest compressions to 3 rescue breaths

UNIT 4

Handling Causalities during Emergency

4.1. Introduction

The unit focuses on the essential steps to handle victims with different injuries during emergency situations. It emphasizes the importance of prioritizing safety, assessing the scene for hazards, and providing immediate care to those with life-threatening injuries. Through effective triage, communication, and coordination, respondent can efficiently address immediate threats and stabilize victims with non-life-threatening injuries. The unit emphasizes maintaining clear airways, controlling bleeding, and immobilizing fractures. It also highlights the significance of providing comfort, reassurance, and clear instructions to victims while documenting the injuries and facilitating a smooth transition of care with professional medical assistance. By following these guidelines, respondent can provide effective and compassionate care to victims with diverse injuries, ensuring their optimal chances of recovery and well-being.

Learning Outcomes

After the accomplishing this unit, the students will be able to:

- Ensure patient safety and comfort during emergencies
- Optimize patient positioning for comfort and safety
- Facilitate safe patient transportation

Key terms: victim, coordination, stabilize victims

4.2. Patient safety and comfort during emergencies

Maintaining patient safety is crucial during emergencies. Healthcare providers must rapidly assess the situation, stabilize the patient, and coordinate appropriate transport to a healthcare facility. Strategies include controlling life-threatening injuries, managing pain and anxiety, and clear communication to mitigate the patient's distress.

Principles for effectively Handling Casualties

Key principles for effectively handling casualties during emergency situations are:

Prioritize Safety: Ensure the safety of yourself, fellow respondent, and the casualties. Assess the scene for any ongoing hazards or dangers before approaching the casualties.

Conduct Triage: Quickly assess and categorize casualties based on the severity of their injuries using a triage system. Prioritize care for those with life-threatening injuries who require immediate attention.

Maintain clear communication: Establish clear communication channels with other respondents, medical personnel, and casualties. Coordinate efforts to ensure efficient and effective care. Provide clear instructions and reassurance to casualties to keep them informed and calm.

Perform Basic Life Support: Administer cardiopulmonary resuscitation stabilize victims if necessary, ensuring airway patency, adequate breathing, and circulation. Control severe bleeding using direct pressure or tourniquets as appropriate.

Stabilize Injuries: Immobilize fractures, dislocations, or spinal injuries using splints or improvised materials to prevent further harm and minimize movement. Attend to wounds and provide basic wound care to reduce the risk of infection.

Address Pain and Discomfort: Administer pain relief medication when available and appropriate for casualties experiencing significant pain or discomfort.

Provide Emotional Support: Offer reassurance, comfort, and empathy to casualties and their families. Communicate in a calm and compassionate manner, keeping them informed about the situation, the care being provided, and the next steps.

Document and Handover: Maintain accurate documentation of the casualties' injuries, care provided, and any relevant information. When professional medical help arrives, provide a clear and concise handover to ensure a smooth transition of care.

Continuously Reassess and Monitor: Regularly reassess casualties' conditions and monitor vital signs. Adjust treatment and care as necessary based on changes in their status.

Seek Professional Medical Assistance: Depending on the severity of injuries, arrange for casualties to be transferred to appropriate medical facilities for further evaluation and treatment.

It is important to note that these principles and guidelines serve as general recommendations. Always follow local protocols, guidelines, and receive proper training to ensure the best possible care for casualties during emergency situations.

Support and comfort care of Victims:

- Offer empathetic and compassionate care to patients during emergencies.
- Listen actively and attentively to patients' concerns and needs.
- Provide clear and concise explanations of procedures and treatments.
- Offer reassurance and encouragement to help alleviate anxiety and fear.
- Respect patients' dignity and privacy while delivering care.
- Collaborate with the healthcare team to coordinate comprehensive support for patients.
- Continuously assess and address patients' comfort needs, including pain management and emotional support.
- Foster a trusting and respectful relationship with patients to enhance their overall well-being.
- Ensure effective communication with patients and their families, ensuring they are informed and involved in the care process.

Self-Check Questions 4.2

1. What is the first principle in effectively handling casualties during emergency situations?
2. Why is clear communication important during emergency response?
3. How can injuries be stabilized during emergency situations?

4.3. Optimize patient positioning for comfort and safety

Proper patient positioning is critical during emergency situations to ensure the patient's airway remains open, circulation is maintained, and further injury is prevented. The specific positioning will depend on the patient's condition and the type of emergency, but some general guidelines include:

- **Airway Management**: If the patient is unconscious or has a compromised airway, place them in the recovery position (on their side with the top leg bent to prevent rolling onto their back).

- **Spinal Injury**: If spinal injury is suspected, immobilize the spine by keeping the patient supine (on their back) and avoid any unnecessary movement. Use cervical collars and spinal boards as needed.
- **Shock**: For patients in shock, lay them flat and elevate the legs to improve venous return and maintain adequate perfusion.
- **Chest Injuries**: For chest injuries like pneumothorax, position the patient semi-upright to facilitate breathing.
- **Burns**: Keep burn victims flat to prevent further injury, covering the affected areas to prevent heat/fluid loss.

The key is to quickly assess the patient's condition and implement the positioning that best supports their vital functions and prevents additional harm.

4.4. Facilitate safe patient transportation

- Ensure proper patient positioning during transportation to maintain airway patency and prevent further injury.
- Secure patients safely using appropriate restraints or devices to minimize movement and enhance their stability during transportation.

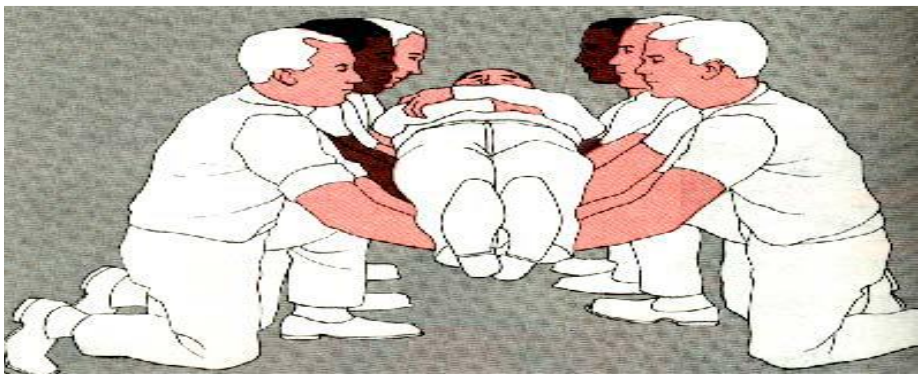


Figure 4.1 Transporting victims

- Utilize specialized equipment, such as stretchers or gurneys, to facilitate safe and comfortable patient transfer.
- Collaborate with the transportation team to ensure smooth communication and coordination during the transfer process.

- Continuously monitor vital signs and patient comfort during transportation, making necessary adjustments as needed.
- Adhere to infection control protocols to minimize the risk of transmission during patient transportation.
- Provide clear instructions and guidance to the transportation team regarding any specific patient needs or precautions.
- Maintain a calm and reassuring demeanor during transportation to help alleviate patient anxiety and promote a sense of safety.
- Document accurate and concise information regarding the patient's condition before, during, and after transportation to ensure continuity of care.

Unit Summary

Handling casualties during emergencies requires a comprehensive approach. First, assess the environment and identify potential risks, such as fire or dangerous substances. Provide immediate first aid and basic life support to stabilize patients and prevent worsening conditions. Prioritize patients based on severity and allocate resources accordingly. Optimize patient positioning for comfort and injury prevention. Maintain an open airway for unconscious patients and stabilize cervical spines for neck or spinal injuries.

Consider individual needs and adapt positioning accordingly.

Securely transport patients to medical facilities, ensuring they are equipped with necessary medical supplies and personnel. Effective communication with receiving facilities is crucial for proper preparation and care upon arrival. By prioritizing patient well-being, providing immediate care, and maintaining effective communication, respondents can maximize the chances of successful treatment and recovery.

Unit Review Question

1. Which of the following is a key objective in handling casualties during emergencies?
   A. Ensuring patient safety and comfort
   B. Coordinating with emergency respondents

C. Administering advanced medical procedures

D. Implementing long-term rehabilitation plans

2. Why is patient positioning important during emergency situations?

A. To assess the immediate environment for risks

B. To stabilize the cervical spine in all patients

C. To optimize patient comfort and prevent further harm

D. To communicate with receiving medical facilities

3. What should be considered when transporting patients during emergencies?

A. The availability of resources at the medical facility

B. The severity of injuries and medical conditions

C. The type of transportation vehicles used

D. The communication with emergency respondents

4. In order to ensure patient safety during emergencies, it is important to:

A. Assess the immediate environment for ongoing risks

B. Administer advanced life support techniques

C. Prioritize patients based on their age

D. Communicate with the media for public awareness

5. What is the purpose of immobilization techniques during patient transportation?

A. To prevent further injury during transit

B. To facilitate communication with medical facilities

C. To ensure patient comfort during transportation

D. To administer medication to patients

UNIT 5

Evaluation of Client in Emergency conditions

5.1. Introduction

In emergency situations, the initial assessment is just the beginning of providing effective care. Being able to re-assess the victim's condition is crucial in monitoring changes, identifying new injuries or symptoms, and adjusting the care plan accordingly. Additionally, knowing how to refer and link clients to the appropriate resources ensures they receive the necessary follow-up care and support beyond the immediate first aid response.

After implementing initial interventions, a comprehensive evaluation of the patient's response is crucial. This secondary assessment allows the healthcare provider to determine the effectiveness of the care provided and guide any further management. The evaluation begins by re-assessing the patient's ABCs - Airway, Breathing, and Circulation. The provider checks if the airway remains patent, breathing is adequate, and circulation is sufficient. Any changes from the initial presentation must be promptly addressed. Next, the provider conducts a thorough head-to-toe examination, looking for any improvements or deterioration in the patient's condition. Vital signs, including heart rate, blood pressure, respiratory rate, and oxygen saturation, are closely monitored and trended.

A thorough, methodical evaluation after initial interventions allows the provider to develop an accurate understanding of the patient's condition. This informs the next steps in stabilizing the patient and determining the appropriate disposition, whether continued care on-site or transport to a higher level of medical facility.

Learning outcomes:

After the accomplishing this unit, the students will be able to:

- Re assessment of the victim
- Referral and linkage of the client

Key terms: Referral, airway,

5. 2. Evaluate client response

5.2.1. Cardiopulmonary Resuscitation interventions

During Cardiopulmonary Resuscitation it is crucial to continually evaluate the client's response to the interventions being performed. This evaluation helps assess the effectiveness of the resuscitation efforts and guides further actions. Key points to consider when evaluating client response to CPR interventions include:

1. **Assessing chest rise and fall**: Observe the chest for any signs of movement or rise and fall, indicating the effectiveness of rescue breaths. Adequate chest rise suggests successful ventilation and oxygenation.

2. **Monitoring for signs of circulation**: Check for the presence of a pulse or signs of spontaneous circulation, such as coughing, movement, or color changes in the skin. The return of circulation indicates a positive response to chest compression.

3. **Observing changes in consciousness**: Evaluate the client's level of consciousness during CPR. Look for signs of responsiveness, such as eye opening, purposeful movement, or verbal response. Any positive change in consciousness indicates a favorable response to resuscitation efforts.

4. **Considering changes in vital signs**: Continuously monitor vital signs, including heart rate, blood pressure, and oxygen saturation levels. Improvements in these parameters indicate a positive response to CPR interventions.

5. **Assessing the effectiveness of interventions**: Evaluate the effectiveness of chest compression and rescue breaths. Adequate depth, rate, and recoil of chest compression, along with proper airway management and effective ventilation, contribute to a successful response to Cardiopulmonary Resuscitation.

Regularly reassessing the client's response to Cardiopulmonary Resuscitation interventions is essential to determine if adjustments are needed, such as modifying compression depth, providing additional rescue breaths, or changing the compression-to-ventilation ratio. Proper evaluation ensures that appropriate measures are taken to maximize the chances of a successful resuscitation outcome.

A. Monitor effectiveness of chest compressions and rescue breaths

Monitoring the effectiveness of chest compressions and rescue breaths is crucial during Cardiopulmonary Resuscitation to ensure optimal resuscitation efforts. Key points to consider when monitoring the effectiveness of these interventions include:

1. Checking compression depth and rate: Maintain an adequate compression depth, typically around 2-2.4 inches (5-6 centimeters) in adults, and a compression rate of 100-120 compressions per minute. Monitoring the depth and rate helps ensure the delivery of effective chest compressions.

2. Assessing chest recoil: After each compression, allow for complete chest recoil. Chest recoil ensures proper blood flow during CPR. Insufficient chest recoil may impede the effectiveness of chest compressions.

3. Observing for visible signs of circulation: Look for signs of circulation, such as color changes in the skin, return of spontaneous movement, or coughing. These signs indicate effective chest compressions and the restoration of blood flow.

4. Assessing the adequacy of rescue breaths: Ensure that rescue breaths are given with proper technique and ventilation volume. Observe the chest rise and fall with each breath to confirm adequate ventilation.

By continuously monitoring the effectiveness of chest compressions and rescue breaths, adjustments can be made as needed to optimize the quality of CPR. Regular assessment and feedback from monitoring devices, such as capnography, can guide healthcare providers in delivering high-quality chest compressions and ventilation, improving the chances of a successful resuscitation outcome.

B. Assess vital signs and consciousness during Cardiopulmonary Resuscitation Assessing vital signs and consciousness during Cardiopulmonary Resuscitation is essential to evaluate the client's condition and response to resuscitation efforts. Key points to consider when assessing vital signs and consciousness during Cardiopulmonary Resuscitation include:

1. Checking for a pulse: Assess the presence or absence of a pulse to determine the need for chest compressions. If no pulse is detected, initiate or continue chest compressions immediately.

2. Monitoring heart rate: If monitoring equipment is available, continuously monitor the client's heart rate. Changes in heart rate can provide indications of the effectiveness of chest compressions and the restoration of circulation.

3. Observing blood pressure: In some cases, blood pressure monitoring may be available during Cardiopulmonary Resuscitation. Monitoring blood pressure can provide additional information about the client's response to resuscitation efforts.

4. Assessing oxygen saturation: Use a pulse oximeter to monitor the client's oxygen saturation (SpO_2) levels. Adequate oxygenation is crucial for optimal resuscitation outcomes.

5. Evaluating consciousness: Assess the client's level of consciousness during Cardiopulmonary Resuscitation. Observe for any signs of responsiveness, such as eye opening, purposeful movement, or verbal response. Changes in consciousness can indicate a positive response to resuscitation efforts.

Continuously assessing vital signs and consciousness during Cardiopulmonary Resuscitation allows for ongoing evaluation of the client's condition and response to interventions. This information guides healthcare providers in making informed decisions regarding the need for adjustments to chest compressions, ventilation, or other resuscitation measures. It also helps identify any improvements or deterioration in the client's condition, enabling timely modifications to the resuscitation approach. Regular assessment of vital signs and consciousness during Cardiopulmonary Resuscitation plays a crucial role in optimizing the chances of a successful resuscitation outcome.

Self-check question 5.2.1

1. What is one key aspect to consider when evaluating the client's response to CPR interventions?
2. How can you monitor for signs of circulation during CPR?
3. Why is it important to evaluate the client's level of consciousness during CPR?
4. What vital signs should be continuously monitored during CPR?

5.2.2. Evaluate client response to choking intervention

Regularly evaluating the client's response to choking interventions, monitoring the effectiveness of actions taken, and assessing the airway and breathing after the choking episode are vital steps

in managing choking emergencies. These assessments guide healthcare providers in determining the need for additional interventions, seeking further medical assistance if necessary, and ensuring the client's safety and well-being.

A. **Evaluate client response to choking interventions**

- Observe the client's behavior and signs of distress, such as clutching the throat, inability to speak, or panic.
- Determine if the client is conscious and responsive. If the client can cough or speak, encourage them to continue coughing forcefully, as it may help dislodge the obstruction.
- If the client is unable to cough or speak, assess the severity of the choking episode and the need for immediate intervention.

B. **Monitor effectiveness of actions to dislodge obstruction**:

- Perform abdominal thrusts (Heimlich maneuver) or back blows and chest thrusts (for infants) to dislodge the obstruction.
- Continuously assess the client's response to these interventions, looking for signs of the obstruction being expelled, such as a forceful cough or ability to breathe.
- If the initial intervention is not successful, repeat the appropriate technique or consider other advanced techniques if trained to do so.

C. Assess airway and breathing after choking episode:

- Once the obstruction is dislodged, assess the client's airway and breathing.
- Observe for the presence of normal breathing, including chest rise and fall, and the absence of stridor (a high-pitched sound during breathing).
- Confirm that the client is able to speak and is not experiencing any ongoing respiratory distress.
- If there are concerns about the client's breathing or airway, provide appropriate medical assistance or activate emergency medical services.

Self -Check question 5.2.2

1. What should you observe to evaluate the client's response to choking interventions?

5.2.3. Evaluate client response to Bleeding

Effective bleeding control is crucial in managing traumatic injuries and preventing excessive blood loss. When addressing bleeding, it is important to monitor the client's response to bleeding control measures, evaluate the effectiveness of hemostatic agents or dressings, and assess vital signs and blood loss are essential to guide ongoing management and determine the need for further interventions or medical assistance. These assessments help ensure effective bleeding control, minimize the risk of complications, and support the client's overall recovery.

Key points to consider for each aspect are as follows:

A. **Monitor client response to bleeding control measures**:

- Observe the client's overall condition and level of consciousness.
- Assess the client's response to initial bleeding control interventions, such as direct pressure, elevation, or application of a tourniquet.
- Look for signs of improvement, such as a decrease in bleeding or stabilization of vital signs.
- Monitor the client's pain levels and provide appropriate pain management if necessary.

B. **Evaluate effectiveness of hemostatic agents or dressings**:

- If hemostatic agents or specialized dressings are used, assess their effectiveness in controlling bleeding.
- Observe for any visible signs of improved hemostasis, such as reduced bleeding or clot formation.
- Pay attention to the application technique and ensure proper usage of hemostatic agents or dressings according to manufacturer instructions.

C. **Assess vital signs and blood loss**:

- Monitor the client's vital signs, including blood pressure, heart rate, and respiratory rate.

- Assess for signs of hypovolemia (low blood volume) caused by excessive blood loss, such as pale skin, cool extremities, and altered mental status.
- Estimate the amount of blood loss by observing the severity of bleeding, the saturation of dressings, or the volume of blood collected in a container.

Self- Check 5.2.3

1. What should you observe to monitor the client's response to bleeding control measures?
2. What vital signs should you monitor when assessing bleeding and blood loss?

5.2.4. Evaluate client response to poisoning intervention

Regularly monitoring the client's response to poisoning interventions, evaluating the effectiveness of antidotes or treatments, and assessing vital signs and symptoms related to poisoning are critical for appropriate management. These assessments guide healthcare providers in determining the need for additional interventions, adjusting treatment plans, and ensuring prompt medical care when necessary. By closely monitoring the client's condition, healthcare providers can optimize the chances of a successful outcome and minimize the potential complications associated with poisoning incidents.

Key points to consider for each aspect are as follows:

A. **Monitor client response to poisoning interventions**:

- Observe the client's behavior, level of consciousness, and signs of distress.
- Determine if the client is exhibiting any improvement or worsening of symptoms.
- Monitor for any adverse reactions or side effects resulting from interventions or treatments provided.
- Continuously assess the client's airway, breathing, and circulation to ensure their stability.

B. **Evaluate effectiveness of antidotes or treatments:**

- If specific antidotes are available for the type of poisoning, assess their effectiveness in neutralizing or counteracting the toxic substance.
- Observe for any signs of improvement in symptoms or reduction in the severity of poisoning-related effects.

- Consider the timing and dosing of antidotes or treatments, as some may require repeated administration or adjustments based on the client's response.

C. **Assess vital signs and symptoms related to poisoning**:

- Monitor the client's vital signs, including heart rate, blood pressure, respiratory rate, and oxygen saturation.
- Observe for any abnormal symptoms related to the specific poisoning, such as nausea, vomiting, seizures, altered mental status, or organ dysfunction.
- Pay attention to changes in skin color, temperature, and moisture levels, as these can provide important clues about the client's condition.

Self Check 5.2.4

1. What should you observe to monitor the client's response to poisoning interventions?

2. How can you evaluate the effectiveness of antidotes or treatments for poisoning?

5.2.5. Evaluate response to Care of the unconscious client

Regularly monitoring vital signs and consciousness, evaluating the effectiveness of airway management and respiratory support, and assessing the response to interventions aimed at maintaining circulation and preventing complications are essential for the care of unconscious patients. These assessments guide healthcare providers in making timely interventions, adjusting treatment plans, and ensuring optimal patient outcomes. These actions are crucial for ensuring the well-being and safety of unconscious patients.

Key points to consider for each aspect are as follows:

A. Monitor vital signs and consciousness:

- Regularly assess vital signs, including heart rate, blood pressure, respiratory rate, and oxygen saturation.
- Observe the level of consciousness by assessing responsiveness, eye opening, and verbal or motor responses.
- Monitor for any changes in vital signs or consciousness that may indicate a deterioration in the patient's condition.

B. Evaluate effectiveness of airway management and respiratory support:

- Ensure that the patient's airway is clear and patent. Clear any obstructions, such as foreign objects or vomit, and position the patient's head and neck to maintain an open airway.
- Monitor the effectiveness of artificial airways, such as an endotracheal tube or supraglottic airway device, if they have been inserted.
- Assess the adequacy of ventilation and oxygenation by observing chest rise, breath sounds, and oxygen saturation levels.

C. Assess response to interventions for circulation and complications prevention:

- Monitor the patient's cardiac rhythm and assess the effectiveness of interventions like cardiopulmonary resuscitation (CPR) or defibrillation, if applicable.
- Evaluate peripheral perfusion by assessing capillary refill, skin color, and temperature.
- Monitor for the development of complications, such as pressure ulcers, deep vein thrombosis, or aspiration pneumonia, and take appropriate preventive measures.

Self -check 5.2.5

1. What should you monitor to assess the response of an unconscious patient to care?

5.3. Evaluating First Aid kits

Regularly monitoring the quality and completeness of assembled first aid kits, evaluating the appropriateness and availability of essential supplies, and assessing the usability and accessibility of the kits contribute to their effectiveness in emergency situations. These assessments help ensure that first aid kits are well-prepared, properly stocked, and user-friendly, supporting prompt and effective first aid care when needed. These actions help ensure that first aid kits are well-equipped and readily accessible when needed.

Key points to consider for each aspect are as follows:

Monitor quality and completeness of assembled first aid kits:

- Regularly inspect first aid kits to ensure they are in good condition, free from damage, and properly sealed.

- Verify that all essential items are present and in usable condition, such as bandages, sterile dressings, adhesive tape, antiseptic solutions, gloves, and scissors.
- Check expiration dates on supplies and replace any expired items to maintain the effectiveness of the first aid kit.

Evaluate appropriateness and availability of essential supplies:

- Assess the appropriateness of the supplies in the first aid kit based on the intended use and the specific context in which it will be used (e.g., workplace, outdoor activities, home).
- Ensure that the first aid kit contains supplies that address common injuries or medical emergencies that may occur in the given setting.
- Evaluate the availability of essential supplies by considering the quantity of each item and the need for restocking or replenishment.

Assess usability and accessibility of first aid kits:

- Evaluate the organization and labeling of supplies within the first aid kit to facilitate easy identification and access during emergencies.
- Consider the design of the first aid kit, including its portability, storage compartments, and ease of opening and closing.
- Assess the visibility and clarity of instructions or reference materials included in the first aid kit to assist users in providing appropriate care.

Common items that are typically found in a basic first aid kit

Figure. 5.1 First aid kit

N.B. The contents of a first aid kit may vary depending on the intended use, specific needs, and regulations of different settings or organizations. It is important to periodically check and replenish the supplies in the kit to ensure it is up-to-date and ready for use in case of emergencies.

Self -Check 5.3

1. What should you monitor when inspecting assembled first aid kits?
2. How can you evaluate the appropriateness of supplies in a first aid kit?
3. What aspects should you assess to determine the usability of a first aid kit?

5.4. Referral and linkage of the client

Monitoring the successful referral and linkage to appropriate healthcare services, evaluating the effectiveness of the referral process for continuity of care, and assessing client satisfaction and outcomes, healthcare providers can ensure that clients receive the necessary care in a timely manner and experience positive outcomes. These assessments help identify areas for improvement in the referral process, address any barriers to care, and enhance the overall quality of healthcare delivery. By focusing on client-centered care and continuous evaluation, healthcare providers can optimize the referral process and support clients in achieving their healthcare goals.

Monitor successful referral and linkage to appropriate healthcare services:

- Track the progress of the referral process to ensure that clients are successfully connected to the recommended healthcare services.
- Monitor whether clients attended their scheduled appointments with the preferred healthcare providers.
- Follow up with clients or the receiving healthcare providers to confirm successful linkage and receipt of care.

Evaluate the effectiveness of the referral process for continuity of care:

- Assess the efficiency and effectiveness of the referral process in facilitating continuity of care.
- Review the timeliness of referrals, communication between referring and receiving healthcare providers, and transfer of relevant client information.
- Evaluate whether the referral process met the client's needs and resulted in a seamless transition to the appropriate healthcare services.

Assess client satisfaction and outcomes resulting from referral and linkage:

- Seek client feedback regarding their satisfaction with the referral process, including the ease of access to the referred services and their overall experience.
- Evaluate the outcomes achieved as a result of the referral and linkage, such as improved health status, better management of health conditions, or increased client engagement in their care.
- Monitor any adverse events or challenges reported by clients during the referral process and address them appropriately.

Self-check 5.4

1. What should you monitor when assessing the successful referral and linkage to appropriate healthcare services?
2. Why is it important to assess client satisfaction and outcomes resulting from referral and linkage?

Unit Summary

Healthcare providers play a crucial role in providing comprehensive and patient-centered care. The re-assessment of the victim and referral and linkage of the client are essential to ensure the well-being and continuity of care for individuals. Regular monitoring and assessment allow healthcare providers to detect deterioration in the victim's health, intervene promptly, and make necessary adjustments to their care plan. By tracking the successful completion of referrals, confirming attendance, and obtaining client feedback, healthcare providers can enhance the quality of care and promote positive experiences for their clients.

Unit Review Questions

1. When evaluating the client's response to CPR interventions, what is the key aspect to consider?
    A. Assessing airway patency
    B. Assessing chest rise and fall
    C. Monitoring blood pressure
    D. Monitoring oxygen saturation
2. How can you monitor for signs of circulation during CPR?
    A. Checking for a pulse or signs of spontaneous circulation
    B. Assessing chest rise and fall
    C. Monitoring blood pressure
    D. Observing changes in heart rate

3. Why is it important to evaluate the client's level of consciousness during CPR?
    A. To determine the need for chest compression
    B. To assess the effectiveness of rescue breaths
    C. To monitor for signs of circulation
    D. To assess the client's response to resuscitation efforts
4. What should you observe to evaluate the client's response to choking interventions?
    A. The client's behavior and signs of distress
    B. The client's blood pressure and heart rate
    C. The client's oxygen saturation levels
    D. The client's level of consciousness
5. What should you observe to monitor the client's response to bleeding control measures?
    A. The client's overall condition and level of consciousness
    B. . The client's respiratory rate and blood pressure
    C. The client's behavior and signs of distress
    D. The client's oxygen saturation levels
6. How can you evaluate the effectiveness of hemostatic agents or dressings in controlling bleeding?
    A. By assessing changes in heart rate
    B. By observing signs of improved hemostasis
    C. By monitoring blood pressure
    D. By evaluating oxygen saturation levels
7. What should you observe to monitor the client's response to poisoning interventions?
    A. The client's overall condition and level of consciousness
    B. The client's respiratory rate and oxygen saturation levels
    C. The client's blood pressure and heart rate
    D. The client's behavior and signs of distress
8. What should you monitor to assess the response of an unconscious patient to care?
    A. The patient's level of consciousness and changes in vital signs
    B. The patient's oxygen saturation levels and respiratory rate
    C. The patient's blood pressure and heart rate
    D. The patient's behavior and signs of distress

9. What should you monitor when inspecting assembled first aid kits?
    A. The expiration dates of supplies
    B. The client's behavior and signs of distress
    C. The client's blood pressure and heart rate
    D. The condition of the kits and presence of essential items
10. What are the key components of a safety management system?
    A. Monitoring blood pressure and heart rate
    B. Assessing the client's level of consciousness
    C. Evaluating the effectiveness of safety procedures
    D. Administering appropriate first aid interventions

Project work at emergency unit

This project provides a unique opportunity for students to gain practical knowledge and hands-on experience in emergency care. Students will observe healthcare professionals, develop essential first aid skills, and reflect on their experiences. Pre-visit preparation includes attending the project introduction session, completing required consent forms, and reviewing project guidelines and safety protocols. During the visit, students should arrive on time, be respectful, and participate in orientation sessions. Observation and learning are essential, including the triage process, patient assessments, and emergency procedures. Hands-on skill development is a key aspect, with hands-on training workshops and simulations.

Students should actively participate in first aid care, support assessment and management, and reflect on their experiences. Safety and ethical considerations are crucial, with students adhering to safety protocols and maintaining professionalism. The project concludes with expressing gratitude to the emergency unit staff, sharing project outcomes, and reflecting on the project's impact on their career aspirations. Students should approach this project with enthusiasm, curiosity, and a commitment to learning, respecting healthcare professionals, patients, and their families.

Project Duration: [Four Days]

1. Project Overview

The project aims to provide high school students with an opportunity to visit and work in the emergency unit to gain practical knowledge and hands-on experience in emergency healthcare. Through this project, students will learn about emergency procedures, first aid skills, and the roles and responsibilities of healthcare professionals in high-stress environments.

2. Pre-Visit Preparation

- Introduce the project to students, explaining its objectives and activities.
- Obtain necessary permissions and approvals from the school administration and the emergency unit.
- Provide students with project guidelines, safety protocols, and expectations.
- Conduct a pre-visit session to familiarize students with emergency healthcare settings, safety measures, and ethical considerations.
- Collect any required student consent forms or medical information forms.

3. Visit Schedule and Activities

Day 1: Orientation and Introduction

- Welcome and introduction to the emergency unit staff.
- Orientation session on emergency unit layout, departments, and functions.
- Discussion on safety protocols, infection control, and personal protective equipment (PPE) requirements.
- Presentation on the roles and responsibilities of healthcare professionals in the emergency unit.

Day 2: Observation and Learning

- Shadowing healthcare professionals during emergency responses.
- Observing the triage process, patient assessments, and emergency procedures.
- Learning about basic life support techniques, such as CPR and AED usage.
- Documenting observations and experiences in a journal.

Day 3: Hands-on Skill Development

- Participating in hands-on training workshops for basic first aid skills.
- Practicing techniques for wound care, bandaging, and splinting.
- Learning to control bleeding and manage shock.

- Engaging in simulations to apply first aid skills in emergency scenarios.
- Receiving feedback and guidance from healthcare professionals.

Day 4: Active Participation and Reflection

- Assisting healthcare professionals in providing first aid care to patients.
- Supporting the assessment and initial management of patients in the emergency unit.
- Interacting with patients and their families, demonstrating empathy and effective communication skills.
- Reflecting on the overall experience and personal growth in first aid skills.
- Preparing a final presentation summarizing key learning and experiences.
- Presenting the insights and reflections to peers, teachers, and healthcare staff.

4. Safety and Ethical Considerations

- Emphasize the importance of adhering to safety protocols and guidelines throughout the visit.
- Remind students to maintain professionalism, respect patient privacy, and confidentiality.
- Provide guidelines for appropriate behavior, attire, and use of technology during the visit.
- Encourage students to seek permission before taking photographs or sharing patient-related information.

5. **Project Conclusion and Follow-up**

- Express gratitude to the emergency unit staff for their support and mentor ship.
- Share project outcomes and experiences with the school community through presentations, reports.

Answers for Self-Check Questions

Unit 1 Self-check answers

1.2. Self-check

1. The primary goal of first aid is to preserve life, prevent further harm, and promote recovery.
2. It is important to assess the situation to ensure your safety and the safety of others and identify any potential hazards or dangers.

3. Professional medical help should be called when the situation is serious or beyond your ability to handle.
4. A. CPR: Cardiopulmonary Resuscitation is a lifesaving technique performed on individuals experiencing cardiac arrest or cessation of breathing.
   B. Hemorrhage: Hemorrhage refers to uncontrolled or excessive bleeding from a blood vessel.
   C. Fracture: A fracture is a break or crack in a bone caused by trauma or injury.
   D. Anaphylaxis: Anaphylaxis is a severe and potentially life-threatening allergic reaction to an allergen.
5. A symptom is a subjective indication or experience reported by an individual that cannot be directly observed by others, while a sign is an objective, observable, and measurable indication of a disease, condition, or injury that can be detected by healthcare providers.

Unit 2 Self-check answers

Self-check 2.3.1

1. The primary objectives of the BLS primary assessment are to preserve life, prevent further injury, and promote recovery.
2. Measuring vital signs in first aid is crucial for identifying emergencies, assessing severity, monitoring treatment, and making informed decisions.

Self-check 2.3.2

1. Vital signs help identify and detect life-threatening emergencies promptly.
2. Vital signs provide crucial information for making informed judgments about the severity of an illness or injury.
3. Accurate vital sign documentation enables effective communication with healthcare providers during the provision of first aid.

Self-check 2.3.3

1. Vital signs are measurable physiological indicators of basic body functions that reflect overall health and provide information about a person's vital status. The most common vital signs include body temperature, heart rate, blood pressure, and respiratory rate.
2. The necessary equipment to take vital signs includes:
   - Thermometer: Used to measure body temperature.

- Stethoscope: Used to listen to heart sounds and assess blood pressure.
- Blood pressure cuff and sphygmomanometer: Used to measure blood pressure.
- Pulse taximeter: Used to measure oxygen saturation in the blood.
- Watch or timer: Used to measure the respiratory rate.
- Pen and paper or electronic device: Used to record the vital sign measurements.

Self-check 2.3.4

1. The normal range for oral temperature is 36.5°C to 37.5°C.
2. To measure axillary temperature, place the thermometer in the center of the armpit, hold the arm against the body for 3 to 5 minutes, and then remove the thermometer to read the temperature on the display. The normal range for axillary temperature is 35.9°C to 36.9°C.
3. Some considerations for temperature measurement include following age-specific guidelines, practicing proper infection control, regularly verifying accuracy, documenting temperature measurements accurately, and maintaining professionalism and clear communication throughout the procedure.

Self Check 2.3.5

1. The pulse is measured by locating a pulse site (such as the radial, carotid, brachial, or femoral arteries), placing the index and middle fingers on the pulse site, and counting the number of pulsations felt within a specific time frame (usually 30 seconds or one minute).
2. The normal resting heart rate for adults is typically between 60 and 100 beats per minute.
3. Radial pulse (wrist), Carotid pulse (neck), Brachial pulse (inside the upper arm), Femoral pulse (groin), Popliteal pulse (behind the knee), Dorsalis pedis pulse (top of the foot), Posterior tibial pulse (inside of the ankle)

Self-Check 2.3.6

1. The purpose of measuring respiratory rate is to assess the frequency of breaths per minute, which helps in evaluating the individual's respiratory status and detecting any abnormal breathing patterns or respiratory distress.
2. The normal range for respiratory rate in adults is typically between 12 and 20 breaths per minute.

3. 3Accuracy can be ensured by observing the rise and fall of the chest or feeling the chest movements, counting each complete breath, and using a stopwatch or timer to count the number of breaths per minute.
4. The respiratory rate varies in different age groups. For example:
    - Newborns (0-1 month): 30-60 breaths per minute
    - Infants (1-12 months): 25-40 breaths per minute
    - Toddlers (1-3 years): 20-30 breaths per minute
    - Preschoolers (3-5 years): 20-30 breaths per minute
    - School-age children (6-12 years): 14-22 breaths per minute
    - Adolescents (12 years and older): 12-20 breaths per minute
5. Accurate documentation of respiratory rate is important for monitoring changes in respiratory status, assessing the effectiveness of treatments, and providing a record for future reference. It helps healthcare professionals track any abnormalities or trends in the individual's breathing patterns.

Self-Check questions 2.3.7

1. Blood pressure is the force of blood against the walls of the arteries.
6. Blood pressure is measured using a sphygmomanometer or an automated device.
7. The two numbers in a blood pressure reading are systolic and diastolic.
8. Normal blood pressure is typically around 120/80 mmHg.

Unit 3 Self-check answers

Self-Check questions **3.2**

1. The mouth is used for breathing and chewing food, while the nose filters, heats, and moistens the air we breathe.
2. If the windpipe gets blocked, it can lead to serious problems and even death as it prevents air from reaching the lungs.
3. The main function of the respiratory system is to facilitate the diffusion of oxygen into the bloodstream, remove waste carbon dioxide, and move air into the lungs.

1. The main function of the heart is to pump blood to and from the body's organs.
2. The four chambers of the human heart are the left auricle, left ventricle, right auricle, and right ventricle.

Self-Check questions 3.3

1. Asthma is a chronic respiratory condition characterized by inflammation and narrowing of the airways, resulting in recurrent episodes of wheezing, coughing, chest tightness, and shortness of breath.
2. If someone is experiencing an asthma attack, help them sit upright, assist them in taking their prescribed inhaler medication, and stay with them until medical help arrives if needed.
3. Choking occurs when an object or a piece of food becomes lodged in the throat, blocking the airway and making it difficult to breathe.
4. If someone is conscious and choking, encourage them to cough forcefully to try and dislodge the object. If the choking persists, you may need to administer the Heimlich maneuver.
5. CPR (Cardiopulmonary Resuscitation) is an emergency procedure performed to manually maintain circulation and provide oxygen to a person whose heart has stopped beating or is not breathing adequately.
6. Step 1: Stand behind the person and slightly to one side.
   Step 2: Place one hand slightly above the person's navel, making a fist.
   Step 3: Grasp your fist with your other hand and give quick upward thrusts into the abdomen until the object is expelled.
7. Step 1: Position the person on their back and straddle their thighs.
   Step 2: Place the heel of one hand on the upper abdomen, just above the navel.
   Step 3: Place your other hand on top of the first hand and interlock your fingers.
   Step 4: Give quick, inward and upward thrusts into the abdomen until the object is expelled.

Self-Check questions 3.4.1-3.4.3

1. Cardiac arrest is the sudden loss of heart function, resulting in the cessation of blood flow to the body's vital organs.
2. If someone experiences cardiac arrest, call emergency services immediately and begin cardiopulmonary resuscitation (CPR) by performing chest compression until help arrives.
3. A heart attack, or myocardial infarction, occurs when blood flow to the heart muscle is blocked, usually due to a blood clot in a coronary artery. This can lead to damage or death of the heart muscle.

4. Common symptoms of a heart attack include chest pain or discomfort, shortness of breath, lightheadedness, nausea, and pain or discomfort in the jaw, neck, or arms.
5. If someone is experiencing symptoms of a heart attack, call emergency services immediately and encourage the person to chew and swallow aspirin (if not allergic or advised otherwise) while waiting for medical help.
6. A stroke, or cerebrovascular accident, occurs when blood flow to the brain is disrupted, leading to brain cell damage or death. This can result from a blockage of blood vessels (ischemic stroke) or bleeding in the brain (hemorrhagic stroke).
7. Common signs of a stroke include sudden numbness or weakness in the face, arm, or leg (usually on one side of the body), confusion, trouble speaking or understanding speech, severe headache, and difficulty walking or maintaining balance.

Self-check question 3.4.4

1. Internal bleeding refers to bleeding that occurs inside the body, often within tissues, organs, or cavities (such as the abdomen or chest) and is not visible externally.
2. Signs and symptoms of internal bleeding may include abdominal or chest pain, dizziness, fainting, rapid breathing, pale or cool skin, swelling or tightness in the affected area, and signs of shock (such as low blood pressure or rapid pulse).
3. If you suspect internal bleeding, it is crucial to seek immediate medical attention. While waiting for medical help, keep the person still and calm, maintain their body temperature, and do not offer them anything to eat or drink.
4. External bleeding refers to bleeding that occurs from visible wounds or injuries on the body's surface.
5. Signs and symptoms of external bleeding may include visible blood loss, bleeding from an open wound, blood-soaked clothing or bandages, and signs of shock (such as pale skin, rapid breathing, or weak pulse).
6. To manage external bleeding, take the following steps:
   - Apply direct pressure to the wound using a clean cloth, gauze, or your hand.
   - Elevate the injured area, if possible, to help reduce blood flow.

- Maintain pressure on the wound until the bleeding stops.
- If bleeding does not stop or is severe, seek medical help immediately.

Self-Check 3.5.1

1. A fracture is a break or crack in a bone.
2. Common signs and symptoms of a fracture include pain, swelling, deformity, inability to bear weight or use the affected limb, and sometimes visible bone protrusion.
3. If you suspect a fracture, it is important to immobilize the affected area, apply ice to reduce swelling, seek medical attention promptly, and avoid moving or putting weight on the injured limb.
4. A sprain is an injury to a ligament, which connects bones at a joint.
5. Common signs and symptoms of a sprain include pain, swelling, bruising, instability of the joint, and difficulty moving the affected joint.
6. To manage a suspected sprain, follow the RICE method: Rest the injured area, apply Ice to reduce swelling, apply Compression with a bandage or brace, and elevate the injured limb. Seek medical attention if the pain or swelling is severe or if you suspect a more severe injury.
7. Dislocation is an injury occurred when the ends of a bone are forced out of their normal position at a joint.
8. Common signs and symptoms of a dislocation include severe pain, visible deformity or misalignment of the joint, swelling, and inability to move the joint.
9. If you suspect a dislocation, it is important to immobilize the joint, apply ice to reduce swelling, seek immediate medical attention, and avoid trying to relocate the joint yourself.
10. You should seek medical attention for a bone or joint injury if you suspect a fracture, if the pain is severe or worsening, if there is significant swelling or deformity, if you are unable to bear weight or use the affected limb, or if you have concerns about the injury.

Self-Check 3.6

1. Seizure.
2. Burns
3. Insect bite
4. Dog bite.

5. Epistaxis.
6. Eye injury.

Unit 4 Self-check answers

Self-Check 4.2

1. Prioritize Safety.
2. It ensures coordination and efficient care among respondents, medical personnel, and casualties.
3. By immobilizing fractures, dislocations, or spinal injuries and providing basic wound care.

Unit 5 Self-check answers

Self-check question 5.2.1

1. Assessing chest rise and fall.
2. Look for the presence of a pulse or signs of spontaneous circulation such as coughing,
3. movement, or color changes in the skin.
4. Changes in consciousness can indicate a positive response to resuscitation efforts.
5. Heart rate, blood pressure, and oxygen saturation levels.

Self -Check question 5.2.2

1. The client's behavior and signs of distress, such as clutching the throat, inability to speak /panic.

Self -Check question 5.2.3

1. level of consciousness, signs of improvement, and pain levels.
2. Blood pressure, heart rate, and respiratory rate.

Self check 5.2.4

1. The client's behavior, level of consciousness, signs of distress, improvement or worsening of symptoms, and any adverse reactions or side effects.
2. By assessing signs of improvement in symptoms or reduction in the severity of poisoning related effects, considering the timing and dosing of antidotes or treatments, and monitoring the client's response.

Self-check 5.2.5

1. Vital signs, level of consciousness, changes in vital signs or consciousness, effectiveness of airway management and respiratory support, cardiac rhythm, peripheral perfusion, and development of complications

Self- check 5.3

1. The condition of the kits, presence and usability of essential items, and expiration dates of supplies.
2. By considering the intended use and specific context of the kit, ensuring it contains supplies
3. for common injuries or emergencies in that setting.
4. The organization and labeling of supplies, portability and storage compartments, ease of opening and closing, and visibility and clarity of instructions or reference materials.

Self-check 5.4

1. When assessing the successful referral and linkage to appropriate healthcare services, you should monitor the progress of the referral process, whether clients attended their scheduled appointments, and follow up with clients or receiving healthcare providers to confirm successful linkage and receipt of care.
2. Assessing client satisfaction and outcomes resulting from referral and linkage helps evaluate the effectiveness of the referral process.

It provides insights into the ease of access to referred services, overall client experience, and whether the referral process contributed to improved health status, better management of health conditions, or increased client engagement in their care.

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Module V

Basic Nutrition Promotion

Contents

Description of the Module

This module provides students with a comprehensive introduction to the essential principles of human nutrition. Learners will begin by exploring the basics of nutrition, including the different macronutrients and micronutrients and their crucial functions within the body. They will also become familiar with dietary reference intakes and recommended daily allowances to understand the nutritional requirements for maintaining optimal health.

The module then explores into strategies for promoting healthy nutrition, guiding students through the fundamentals of a balanced and nutritious diet. Students will examine dietary guidelines, food groups, and practical approaches for improving nutrition at both the individual and community levels. Additionally, the module examines how nutritional needs evolve across the lifespan, from the critical prenatal and developmental stages through adolescence.

A key focus of the module is identifying and addressing common nutritional problems, such as malnutrition, nutrient deficiencies, and dietary-related chronic diseases. Students will learn to recognize the symptoms and underlying causes of these issues, as well as develop the skills to assess the nutritional status of a community using anthropometric measurements and dietary intake assessments.

Learning Outcomes

At the end of this module students will be able:

- To Identify basics of nutrition
- Promote healthy nutrition
- Optimize Nutrition across the Lifespan: From Prenatal to Adolescence
- Identify common nutritional problems
- Assess community nutritional status

UNIT 1

Basic Nutrition

1.1. Introduction

Nutrition refers to the process by which the body obtains and utilizes nutrients from food for growth, development, and maintenance of health. It involves the study of how nutrients are digested, absorbed, transported, metabolized, and excreted by the body.

Nutrition is vital for maintaining general health and wellbeing because it gives the body the nutrients it needs for development, growth, and illness prevention. It is necessary to sustain a healthy weight, boost the immune system, encourage the best possible cognitive function, and supply energy for day-to-day tasks. The diet contains critical elements that are necessary for the body to function.

Nutrition encompasses the study of nutrients and their roles in the body, as well as the relationship between diet, health, and disease. It involves understanding the different types of nutrients, such as carbohydrates, proteins, fats, vitamins, and minerals, and how they contribute to various bodily functions. Nutrition also explores the concept of energy balance and the importance of maintaining a balanced diet for optimal health. Additionally, nutrition involves examining dietary patterns, food choices, and the impact of cultural, social, and environmental factors on eating habits. It plays a crucial role in preventing and managing chronic diseases, promoting growth and development, and supporting overall well-being. Essential nutrients fall into six key categories: water, vitamins, minerals, proteins, fats, and carbohydrates.

Unit out comes

- Identify essential nutrient
- Identify classification of nutrients

Key terms: Nutrition, Nutrients, deficiency

1.2. Definition of terms related to Food and nutrition

- Food - is any substance when ingested or eaten nourishes the body.
- Nutrition - is the study of food in relation to health.
- Nutrients: Nutrients are the chemical substances found in food. Nutrients are extracted from food as it passes through our digestive system and are used by the body to perform its functions.
- Macronutrient: Macronutrients are required by the body in large amounts and include carbohydrates, proteins and fat.
- Micronutrient: Micronutrients are required by the body in small amounts and include vitamins and minerals.
- Malnutrition - It is the condition of the body resulting from a lack of one or more essential nutrients or due to excessive nutrient supply.
- Calorie - fuel potential in a food. One calorie represents the amount of heat required to raise one liter of water one degree Celsius.
- Food security: Exists when all people at all times have physical and economic access to sufficient, safe nutritious food that meets their dietary needs and food preferences for an active, healthy and productive life throughout the year.
- Food safety: The protection of consumers from injury or adverse health effects caused by consuming or handling spoilt, adulterated or badly stored foods. Food safety describes the production, handling, preparation and storage of food in a way that prevents food borne illnesses. This includes a number of routine activities that should be followed to avoid potentially severe health hazards.
- Nutritious diets: Consumption of a variety food that can potentially supply all the body nutritional requirements on a daily basis.
- Stunting: is defined as having a height-for-age z score (HAZ) <–2SD.
- Wasting: A massive reduction or loss of body weight, it can be moderate or severe (gross loss of muscle bulk, redundant skin and prominence of bones)
- Digestion - it is a mechanical and chemical breakdown of food into smaller components.
- Absorption - it is a process where the nutrients from foods are absorbed by the body into the bloodstream.

- Metabolism - is a chemical process of transforming foods into other substances to sustain life.
- Enzymes - an organic catalyst that is protein in nature and is produced by living cells. A catalyst speeds up or slows down chemical reactions without itself undergoing change.

1.3. Food

1.3.1. Definition of food

What is food?

Food is a substance that can be in liquid, semi-solid, or solid form and contains nutrients and energy that nourish the body. It plays a vital role in providing the necessary substances for our bodies to function optimally. When we consume food, it supplies the nutrients needed to move, think, work, and support the various systems in our bodies. Additionally, food helps to maintain our overall health, boosts our immune system, and protects us from infections.

When we eat food, our bodies absorb the beneficial nutrients into the bloodstream, from which they are transported to areas where they are required or stored for later use. The food we consume is utilized for growth, maintenance, and supporting the body's various functions.

1.3.2 Classification of Food

Foods may be classified according to their functions in the body:

A. Energy Giving Food

Energy-giving foods can be classified as a specific category of energy foods. They are characterized by their high content of carbohydrates and fats, which are the primary sources of energy for the body. These foods provide calories or energy that is utilized by the body to perform various physiological processes, including muscle movement, organ function, and cellular metabolism.

Examples of energy-giving foods include:

- Cereals (such as rice, wheat, oats, and corn)
- Roots and tubers (such as potatoes, sweet potatoes, and carrots)
- Starchy fruits (such as bananas and plantains)
- Starchy vegetables (such as peas, corn, and winter squash)

- Oils (such as olive oil, vegetable oil, and coconut oil)
- Dairy products (such as milk, butter, and ghee)

Figure: 1.1. Sources of carbohydrate

B. Body-building foods (“GROW” foods)

Body-building foods, also known as "GROW" foods, are a category of foods that are rich in protein. These foods play a crucial role in maintaining life, promoting growth, and repairing damaged body tissues. Body-building foods can be obtained from both animal and plant sources. Animal protein sources are generally considered to be of higher quality, soybeans are an exception as they are a plant source with high-quality protein. Body-building foods in our diet helps to support the growth and repair of body tissues, ensuring the proper functioning and development of the body.

Animal sources of protein:

- Milk and dairy products (such as milk, cheese, yogurt)
- Meat (such as beef, pork, lamb, poultry, and game meats)
- Eggs (including chicken, duck, quail eggs)
- Fish and seafood (such as salmon, tuna, shrimp, and shellfish)
- Poultry (such as chicken and turkey)
- Dairy alternatives (such as soy milk, almond milk, and oat milk fortified with protein)

Plant sources of protein:

- Legumes (such as beans, lentils, chickpeas, and peas)
- Nuts and seeds (such as almonds, walnuts, peanuts, chia seeds, and flaxseeds)
- Tofu and tempeh (soybean-based products)

- Quinoa
- Edamame (young soybeans)
- Seitan (wheat gluten)
- Whole grains (such as brown rice, oats, and whole wheat products)
- Spirulina and other algae-based protein sources

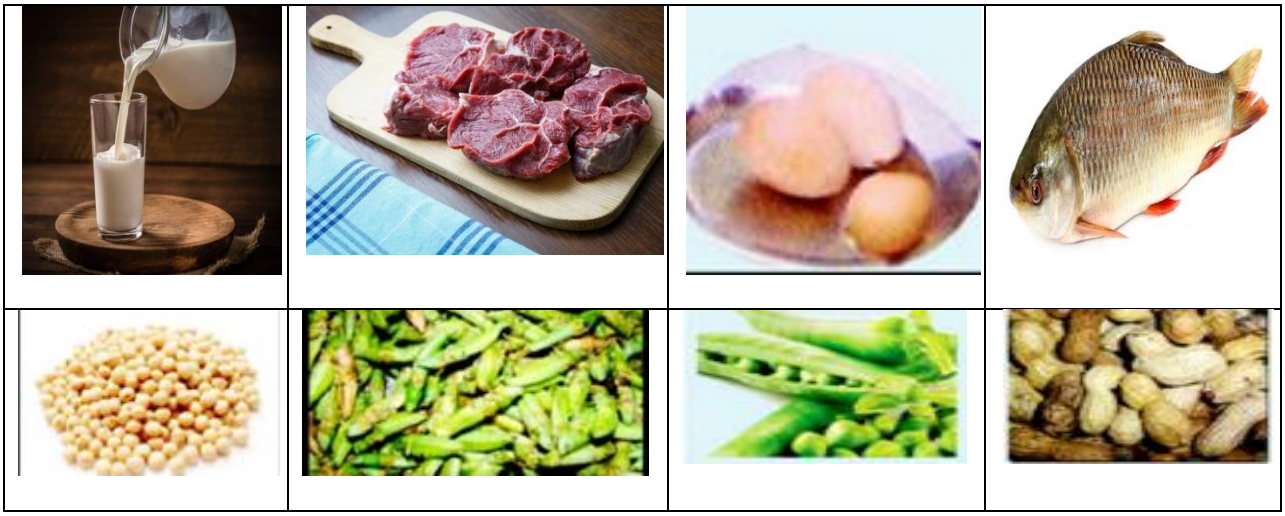


Figure 1.2: Sources of protein

C. Protective (“GLOW” foods)

Foods that are rich in minerals and vitamins are often referred to as "protective" or "GLOW" foods. These foods play a crucial role in promoting a strong immune system and supporting various regulatory functions in the body. The primary sources of Protective foods are fruits and vegetables, which are abundant in a wide range of vitamins and minerals. Additionally, fortified foods, including iodized salt, can also serve as good sources of Protective foods by providing essential nutrients. By incorporating Protective foods into our diet, we can support our overall health and well-being.

A list of protective or “Protective” foods those are rich in minerals and vitamins:

Fruits:

- Citrus fruits (such as oranges, grapefruits, lemons, and limes), berries (such as strawberries, blueberries, raspberries, and blackberries), apples, bananas, kiwi, Pineapple, mangoes, avocado, watermelon etc.

Vegetables:

- Leafy greens (such as spinach, kale, swiss chard, and arugula), cruciferous vegetables (such as broccoli, cauliflower, brussels sprouts, and cabbage), bell peppers, tomatoes, carrots, sweet potatoes, spinach, asparagus, green beans etc.

Figure: 1.3 Sources of Protective

1.3.3. Basic Nutrition

Nutrition: is the study of how food affects the body and provides the necessary nutrients for growth, maintenance and repair. It involves the consumption of various types of food, such as carbohydrates, proteins, fats, vitamins and minerals in the right amount and balance to support a healthy life style.

Nutrients: are the chemical substances found in food. Nutrients are extracted from food as it passes through our digestive system and are used by the body to perform its functions.

There are six basic nutrients: carbohydrates, proteins, fats, vitamins, minerals, and water. All of these are classified as essential and non essential. Your body requires essential nutrients to function properly. These nutrients must be obtained from the foods you eat; your body cannot make them its own.

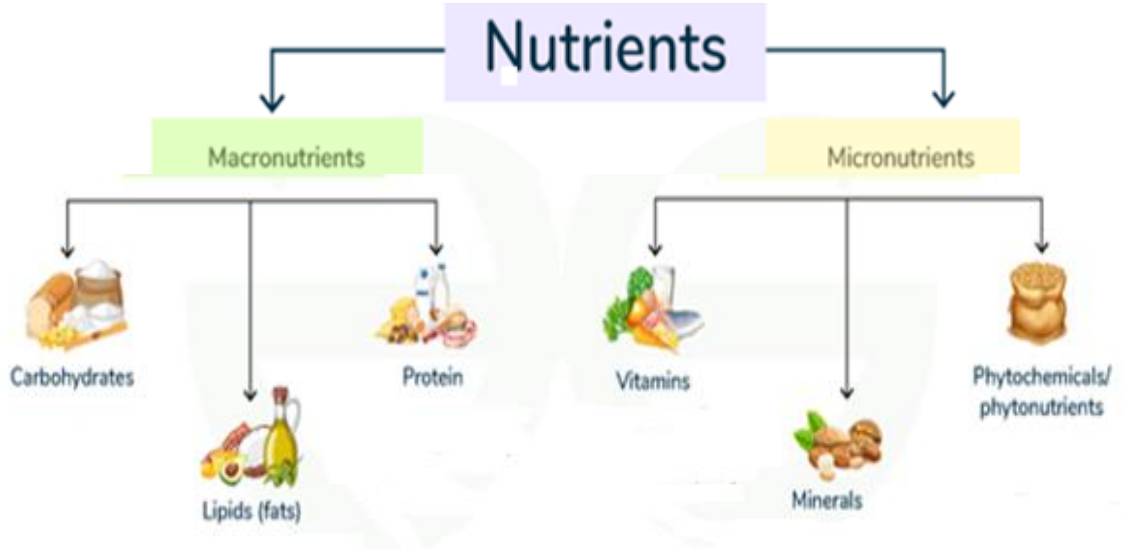


Figure: 1.4. Classification of nutrients

1.3.3.1. Macro and micronutrients

The nutrients your body needs to promote growth and development and regulate bodily processes can be divided into two groups: macronutrients and micronutrients

A. Macronutrient

Macronutrients are required by the body in large amounts that provide energy or calories. Macronutrients include carbohydrates, proteins, and fats.

Carbohydrates: Carbohydrates are the body's primary source of energy. They are broken down into glucose, which fuels various bodily processes. Carbohydrates also provide dietary fiber, which aids in digestion and promotes bowel regularity.

Proteins: Proteins are macronutrients made up of amino acids, which are the building blocks of body tissues. They are necessary for muscle growth and repair, the production of enzymes and hormones, and the functioning of the immune system.

Fats: Fats also known as lipids are concentrated sources of energy. They are important for the absorption of fat-soluble vitamins, insulation and protection of organs, hormone production, and cell membrane structure.

B. Micronutrient:

Micronutrients are required by the body in small amounts and it includes vitamins and minerals.

Vitamins: Vitamins are organic compounds that the body needs in small amounts to support essential functions. They play a crucial role in metabolism, immune function, energy production, and the maintenance of healthy skin, eyes, and bones.

Minerals:

Minerals are inorganic substances required by the body in small amounts to carry out various functions. They are essential for the formation of bones and teeth, fluid balance, nerve function, and the production of hormones and enzymes.

Water: Water is vital for maintaining hydration and facilitating various physiological processes in the body. It helps regulate body temperature, transport nutrients and waste, and lubricate joints

Self-check question 1.3

1. Which group of food has more calories?
2. Why we say micro and macro nutrient?

Unit Summary

Understanding nutrition is crucial for maintaining optimal health and well-being. It involves knowledge of the three main macronutrients (carbohydrates, proteins, and fats) and their food sources. Carbohydrates provide energy, proteins support tissue growth and repair, and fats play a role in various bodily functions. The body obtains and utilizes nutrients through the process of digestion, absorption, metabolism, and excretion. Essential nutrients are those that the body cannot produce and must be obtained from the diet, while non-essential nutrients can be synthesized by the body. Vitamins and minerals are vital for various bodily functions and can be obtained from a balanced diet.

Energy balance is the equilibrium between energy intake and expenditure, and it is important for maintaining a healthy weight. Nutrition plays a significant role in preventing and managing chronic diseases by promoting healthy eating habits and nutrient adequacy. Factors such as culture, environment, and personal preferences can influence food choices. A balanced diet is crucial for overall health and well-being, as it provides the necessary nutrients in appropriate

proportions. Lastly, nutrition is essential for growth and development, supporting optimal physical and cognitive development in individuals of all ages.

Unit Review questions

1. What are the three main macronutrients? Provide examples of food sources for each.
    A. Carbohydrates, proteins, and vitamins
    B. Proteins, fats, and minerals
    C. Carbohydrates, proteins, and fats
    D. Fats, vitamins, and minerals

2. What are the functions of carbohydrates, proteins, and fats in the body?
    A. Carbohydrates provide energy, proteins build muscle and tissues, and fats regulate body temperature.
    B. Carbohydrates help with brain function, proteins aid in digestion, and fats strengthen bones.
    C. Carbohydrates provide energy, proteins support growth and repair, and fats insulate organs.
    D. Carbohydrates aid in vitamin absorption, proteins provide energy, and fats support the immune system.
3. What are the major sources of vitamins and minerals in the diet?
    A. Meat and dairy products
    B. Fruits and vegetables
    C. Grains and legumes
    D. Oils and fats

UNIT 2

Healthy Nutrition

2.1. Introduction

This topic will encompass various aspects of a balanced diet, including the components of a balanced meal, portion sizes, serving recommendations, and dietary guidelines. It will also touch upon the importance of mindful eating, meal planning and preparation, and reading food labels. Additionally, it will explore the role of nutrition in preventing chronic diseases and the connection between diet and lifestyle choices. Moreover, this topic provides an opportunity to discuss the significance of making informed food choices, understanding nutritional needs based on age, gender, and cultural considerations, and implementing healthy eating habits to reduce the risk of chronic diseases like obesity, diabetes, and cardiovascular diseases.

Unit outcomes

- Identify importance of balanced diet.
- promote healthy eating habits

Key terms: balanced diet, lifestyle choices.

2.2. Balanced Diet

As community health students, it is crucial to understand the importance of promoting a balanced diet and healthy eating habits within communities. A balanced diet plays a significant role in maintaining overall health and preventing chronic diseases. Here are some key points to consider:

A balanced diet is important for maintaining good health and providing the body with the necessary nutrients it needs to function properly.

Components of a balanced meal:

- Carbohydrates, proteins, and fats: These include whole grains, lean proteins (such as poultry, fish, legumes, or tofu), and healthy fats (like avocados, nuts, or olive oil).
- Fruits and vegetables: Aim to include a variety of colorful fruits and vegetables in your meals to obtain essential vitamins, minerals, and fiber.

- **Dairy or dairy alternatives**: If you consume dairy, choose low-fat or non-fat options like milk, yogurt, or cheese. Non-dairy alternatives such as almond milk or soy yogurt can be used if preferred or necessary.
- **Hydration**: Drink an adequate amount of water throughout the day to stay hydrated.

Portion sizes and serving recommendations

- It's important to be mindful of portion sizes to avoid overeating. Use visual cues like using your hand or measuring cups to estimate appropriate portion sizes for different food groups.
- Aim to fill half of your plate with non-starchy vegetables, one-quarter with lean protein, and one-quarter with whole grains or starchy vegetables.
- Limit added sugars, sodium, and unhealthy fats by moderating the portion sizes of foods high in these components.

Dietary guidelines and food pyramids

- Dietary guidelines are evidence-based recommendations provided by health organizations or governments to promote healthy eating patterns.
- Food pyramids or plates visually represent the recommended proportions of different food groups in a balanced diet.
- These guidelines and pyramids may vary depending on the country or organization providing them, but they generally emphasize the importance of consuming a variety of nutrient-dense foods, limiting added sugars and unhealthy fats, and promoting portion control.
- Familiarize yourself with the dietary guidelines and food pyramids specific to your country or region to make informed choices about your diet.

N.B. Remember that individual dietary needs and preferences can vary, so it's a good idea to consult with a healthcare professional or registered dietitian for personalized advice on portion sizes, serving recommendations, and dietary guidelines based on your specific needs and goals.

Self-check question 2.2.

1. Why is a balanced diet important for maintaining good health?

2.3. Healthy Eating Habits

Making healthy dietary choices can aid in the prevention of conditions like diabetes, heart disease, obesity, high blood pressure, certain malignancies, and osteoporosis. Eating a plant-based diet rich in whole, unprocessed foods can help prevent and manage heart disease, type 2 diabetes, and several types of cancer.

Good nutrition prevents:

- Diabetes
- Heart disease
- Obesity
- High blood Pressure
- Certain cancers
- Osteoporosis

Healthy eating habits: Emphasize the benefits of mindful eating, which involves being present and aware while eating. Encourage individuals to engage in meal planning and preparation to make healthier choices and control portion sizes. Teach them how to read and understand food labels to make informed decisions about the nutritional content of packaged foods.

Diet strongly impacts the prevention of chronic diseases like obesity, diabetes, and heart disease. (**Refer your Non communicable disease Module**). The community health service worker helps the community members understand how dietary choices and lifestyle factors can impact their health outcomes. Provide practical strategies to integrate healthy eating habits into their daily lives.

By focusing on these key concepts, community health service worker can empower individuals and communities to make informed choices about their diets and develop healthy eating habits. Remember to approach community health education with cultural sensitivity and adapt your strategies to meet the specific needs of the population you are working with.

Self-Check question 2.3

1. What are the benefits of practicing mindful eating and engaging in meal planning and preparation?
2. Which chronic diseases can be prevented through good nutrition choices?

Unit Summary

Encouraging individuals to adopt healthy eating habits and incorporate a balanced diet into their daily lives requires various strategies. Education and awareness play a vital role in promoting the importance of balanced nutrition. Practical tips, such as meal planning and preparation, can facilitate the integration of healthy food choices. Overcoming barriers, such as time constraints or limited access to healthy options is crucial.

Understanding social and environmental influences on food choices helps individuals navigate challenges effectively. Portion control and mindful eating contribute to maintaining a balanced diet. The ability to read and interpret food labels empowers individuals to make informed dietary choices. Support systems and community resources provide valuable assistance and motivation. By applying knowledge and strategies, individuals can encourage others to adopt and sustain healthy eating habits, fostering overall well-being.

Unit Review Questions

1. What are some strategies to encourage healthy eating habits in individuals?
2. How can education and awareness campaigns promote the importance of a balanced diet?
3. What are practical ways to incorporate a balanced diet into daily life?
4. How does meal planning and preparation contribute to maintaining healthy eating habits?
5. What are common barriers to adopting a balanced diet, and how can they be overcome?
6. How do social and environmental factors influence food choices, and how can individuals navigate them?
7. Why is portion control important in maintaining a balanced diet, and how can it be practiced?
8. What skills are needed to read and interpret food labels for making informed dietary choices?
9. How can support systems and community resources contribute to promoting healthy eating habits?
10. How can you encourage others to adopt and sustain healthy eating habits?

UNIT 3

Optimizing Nutrition across the Lifespan

3.1 Introduction

Proper nutrition plays a crucial role in every stage of life before birth to adolescence. This unit focuses on prenatal nutrition, infant nutrition, toddler and preschooler nutrition, school-age children nutrition, adolescent nutrition, nutrition and pregnancy-related conditions, nutrition and childhood obesity prevention, and micronutrient deficiencies in children and adolescents. By understanding the nutritional needs and implementing appropriate health education and promotion strategies, community health service worker can support optimal growth, development, and overall health of the community.

Unit outcomes

- Explain nutrition's role in fetal development and maternal health during pregnancy.
- Describe nutrition's support for growth, brain development, and immune function in infants during their first year.
- Identify essential nutritional requirements for toddlers and preschoolers' growth and development.
- Analyze nutrition's impact on physical growth, cognitive function, and overall health in school-age children.
- Assess critical nutritional needs for promoting health, independence, and preventing diseases in the elderly.

  Key terms: Proper nutrition, calories

3.2. Importance of parental nutrition

Proper nutrition is vital during pregnancy to support the growth and development of the fetus and to maintain the overall health of the mother. The body nutritional needs change significantly during pregnancy, requiring additional calories, macronutrients, and micronutrients. Adequate nutrition during pregnancy helps ensure optimal maternal health, reduces the risk of complications, and supports the healthy development of the baby.

Maternal nutrition plays a crucial role in shaping the future health of the fetus. The nutrients obtained from the mother's diet are essential for the development of organs, tissues, and systems in the growing baby. Poor maternal nutrition can increase the risk of birth defects, low birth weight, preterm birth, and long-term health issues for the child. Conversely, a well-balanced and nutrient-rich diet during pregnancy can positively impact the baby's growth, cognitive development, and overall health outcomes.

Key nutrients for a healthy pregnancy:

- Several key nutrients are particularly important during pregnancy to support maternal health and fetal development. These include:

- Folic acid: Adequate intake of folic acid helps prevent neural tube defects and supports the early development of the baby's brain and spinal cord.
- Iron: Iron is essential for the production of red blood cells and oxygen delivery to the baby. Insufficient iron intake can lead to iron-deficiency anemia in both the mother and the baby.
- Calcium and vitamin D: Sufficient calcium and vitamin D are crucial for the development of the baby's bones and teeth, as well as for maintaining the mother's bone health.
- Omega-3 fatty acids: These essential fatty acids, particularly DHA (docosahexaenoic acid), are important for the development of the baby's brain and eye.
- Protein: Adequate protein intake is necessary for the growth and development of the baby's tissues and organs.
- Other important nutrients include vitamin C, vitamin A, zinc, magnesium, and iodine.

Ensuring a well-balanced and varied diet that includes a wide range of nutrient-rich foods is essential for meeting the nutritional needs of both the mother and the growing baby during pregnancy. Healthcare professionals play a crucial role in educating and guiding pregnant women to make informed choices about their nutrition, promoting healthy pregnancies and optimal outcomes for both mother and child.

3.2 Self Check question

1. Proper nutrition is not vital during pregnancy.
2. The body's nutritional needs do not change significantly during pregnancy.
3. Adequate nutrition during pregnancy helps reduce the risk of complications.
4. Poor maternal nutrition has no impact on the baby's health.
5. Folic acid is not important for the early development of the baby's brain and spinal cord.
6. Sufficient calcium and vitamin D are not crucial for the development of the baby's bones and teeth.
7. Omega-3 fatty acids, particularly DHA, are not important for the development of the baby's brain and eyes.
8. Healthcare professionals do not play a crucial role in educating and guiding pregnant women about nutrition.

3.3 Importance of Infant Nutrition

Nutrition during the infant stage is crucial for a child's health and development. Breastmilk provides essential nutrients for brain growth, immune system, and physical development. Establishing healthy eating habits from early on ensures lifelong wellness.

3.3.1 Breastfeeding benefits and techniques

Breastfeeding provides numerous benefits for both infants and mothers. Breast milk contains the ideal balance of nutrients, antibodies, and enzymes that support the baby's immune system, growth, and development. It also promotes bonding between the mother and baby. Community health service worker plays a crucial role in educating mothers about the benefits of breastfeeding, providing guidance on proper handling techniques (Attachment and Positioning during breastfeeding), and addressing common challenges such as sore nipples or low milk supply.

Four signs of good attachment are:

- More of the areola is visible above the baby's top lip than below the lower lip;
- The baby's mouth is wide open;
- The baby's lower lip is curled outwards;
- The baby's chin is touching or almost touching the breast.

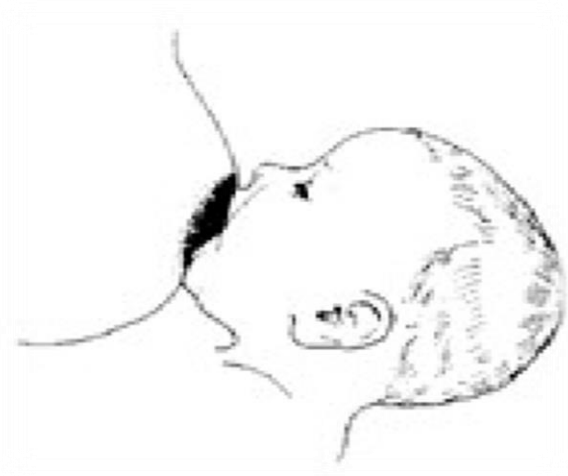


Figure 3.3.1 A .Four signs of good attachment

Four signs of good positioning

- The newborn's head and body straight.
- Facing her breast, with baby's nose opposite her nipple.
- The newborn's body closes to her body.
- Supporting the baby's whole body, not just the neck and shoulders.

Figure 3.3.1.B. Four signs of good positioning

Self-check question 3.3

1. What are the main benefits of breastfeeding for infants?
   A. Provides essential nutrients, antibodies, and enzymes
   B. Promotes bonding between mother and baby
   C. Supports immune system, growth, and development
   D. All of the above
2. What is the role of a community health service worker in supporting breastfeeding?
   A. Educate mothers about breastfeeding benefits
   B. Provide guidance on proper breastfeeding techniques
   C. Address common breastfeeding challenges
   D. All of the above
3. Which of the following is a sign of good attachment during breastfeeding?
   A. More areola visible above the top lip
   B. Baby's mouth is narrowly open
   C. Baby's lower lip is curled inwards
   D. Baby's chin is not touching the breast

4. Which of the following is a sign of good positioning during breastfeeding?
   A. Newborn's head and body are straight
   B. Newborn is facing away from the breast
   C. Newborn's body is not close to the mother's body
   D. Mother is only supporting the newborn's neck and shoulders
5. Establishing healthy eating habits from an early age can ensure:
   A. Lifelong wellness
   B. Increased risk of chronic diseases
   C. Delayed physical development
   D. None of the above

3.4. Introduction of solid foods and appropriate timing

Around six months of age, infants typically start showing signs of readiness for solid foods. Community health service workers can guide parents on the appropriate timing and method of introducing solid foods. They can recommend starting with iron-rich foods, such as pureed meats, fortified cereals, or legumes. Gradual introduction of a variety of fruits, vegetables, whole grains, and protein sources is important to expose infants to different flavors and textures and promote healthy eating habits. They can also advise on appropriate portion sizes and monitor for signs of allergies or intolerances.

Nutritional requirements for optimal growth and development

During infancy, the nutritional needs of infants are rapidly changing as they grow and develop. Community Healthcare workers can educate parents about the specific nutrient requirements for optimal growth and development. These include adequate amounts of protein for muscle and tissue development, healthy fats for brain development, carbohydrates for energy, vitamins and minerals for overall health, and sufficient hydration. They can also provide guidance on age-appropriate portion sizes and help parents understand the importance of offering a variety of nutritious foods to meet their baby's needs.

Community health worker play a crucial role in supporting parents to make informed decisions about their infant's nutrition. They can provide evidence-based recommendations, monitor growth and development, assess feeding practices, and address any concerns or issues that may arise. By promoting optimal nutrition during infancy, healthcare professionals contribute to the long-term health and well-being of the child.

- Around six months of age, infants typically start showing signs of readiness for solid foods.
- Community health service workers can guide parents on the appropriate timing and method of introducing solid foods.
- Community health service workers can recommend starting with iron-rich foods, such as pureed meats, fortified cereals, or legumes.
- Gradual introduction of a variety of fruits, vegetables, whole grains, and protein sources is not important for exposing infants to different flavors and textures and promoting healthy eating habits.
- Community healthcare workers can educate parents about the specific nutrient requirements for optimal growth and development, including adequate amounts of protein, healthy fats, carbohydrates, vitamins, minerals, and hydration.

Self-Check 3.4

1. Around six months of age, infants typically start showing signs of readiness for solid foods.
2. Community health service workers can guide parents on the appropriate timing and method of introducing solid foods.
3. Community health service workers can recommend starting with iron-rich foods, such as pureed meats, fortified cereals, or legumes.
4. Gradual introduction of a variety of fruits, vegetables, whole grains, and protein sources is not important for exposing infants to different flavors and textures and promoting healthy eating habits.
5. Community healthcare workers can educate parents about the specific nutrient requirements for optimal growth and development, including adequate amounts of protein, healthy fats, carbohydrates, vitamins, minerals, and hydration.

3.5 Toddler and Preschooler Nutrition

Age-appropriate portion sizes and food choices: Community health service workers play a vital role in guiding parents and caregivers on age-appropriate portion sizes and food choices for toddlers and preschoolers. As children grow, their nutritional needs change, and it is important to provide them with a balanced diet that includes a variety of foods. Community health workers can educate parents about appropriate serving sizes for different food groups and provide examples of nutrient-dense foods that support healthy growth and development. They can also emphasize the importance of limiting sugary snacks and beverages and promoting whole foods, such as fruits, vegetables, whole grains, lean proteins, and healthy fats.

Strategies for dealing with picky eaters: Picky eating is common during the toddler and preschool years, and it can be challenging for parents and caregivers. Community health workers can provide strategies to address picky eating behaviors and ensure that children still receive adequate nutrition.

They can advise on creating a positive mealtime environment, introducing new foods gradually, involving children in meal planning and preparation, and offering a variety of options at each meal. They can also help parents understand that it may take multiple exposures to a new food before a child accepts it and encourage them to be patient and persistent.

Promoting healthy eating habits during early childhood: Early childhood is a critical period for establishing healthy eating habits that can have long-lasting effects on a child's health. Community health service workers can educate parents and caregivers about the importance of modeling healthy eating behaviors and creating a positive food environment at home. They can provide guidance on setting regular meal and snack times, offering a variety of nutritious foods, and limiting highly processed and sugary foods. They can also emphasize the importance of family meals and engaging children in age-appropriate discussions about nutrition and food choices.

Community health service worker can offer resources such as age-appropriate meal plans, recipes, and educational materials to support parents and caregivers in promoting healthy eating

habits. They can also monitor growth and development, address concerns about weight, and provide referrals to registered dietitians or nutritionists when needed.

By encouraging healthy eating habits during early childhood, community health service workers contribute to the overall well-being and healthy development of children.

3.5 self-check

Direction: If the statement is correct say **True** or if it is wrong say **false**

1. Community health service workers play a vital role in guiding parents and caregivers on age-appropriate portion sizes and food choices for toddlers and preschoolers.
2. Community health workers can educate parents about appropriate serving sizes for different food groups but do not need to provide examples of nutrient-dense foods that support healthy growth and development.
3. Community health workers can provide strategies to address picky eating behaviors and ensure that children still receive adequate nutrition, such as creating a positive mealtime environment and involving children in meal planning and preparation.
4. Early childhood is not a critical period for establishing healthy eating habits that can have long-lasting effects on a child's health.
5. Community health service workers can offer resources such as age-appropriate meal plans, recipes, and educational materials to support parents and caregivers in promoting healthy eating habits.

3.6 School-Age Children Nutrition

Community Health service worker can play a role in promoting balanced meals for school-age children by providing guidance to parents and caregivers. They can educate them about the importance of including a variety of food groups in their child's lunch, such as whole grains, lean proteins, fruits, vegetables, and dairy or dairy alternatives. Thet can also offer suggestions for healthy and convenient lunch options, such as homemade sandwiches, wraps, salads, or pasta dishes. They can emphasize the importance of portion control and encourage parents to involve their children in meal planning and preparation to increase their engagement and enjoyment.

Snack options that are both nutritious and appealing:

Choosing nutritious snacks for school-age children is essential for supporting their energy levels, concentration, and overall health. Community health service workers can provide parents and caregivers with a list of healthy snack options that are both nutritious and appealing to children.

These may include fresh fruits and vegetables, yogurt, nuts and seeds, whole-grain crackers or pretzels, homemade granola bars, or hummus with whole-grain pita bread. They can also advise on avoiding sugary snacks and beverages and encourage parents to provide water as the main beverage option.

Promoting healthy eating in school settings:

Community health workers can collaborate with schools to promote healthy eating environments and practices. They can advocate for the implementation of nutrition policies that prioritize nutritious meals and snacks in school cafeterias, vending machines, and classroom celebrations. They can also support the inclusion of nutrition education in the curriculum, involving children in gardening or cooking activities, and organizing wellness programs or events. Community service workers can work with school staff to provide training and resources for teachers on promoting healthy eating habits and addressing common challenges related to nutrition in the school setting.

Providing guidance on balanced meals, nutritious snacks, and promoting healthy eating in school settings, healthcare workers can contribute to the overall well-being and development of school-age children. They can empower parents, caregivers, and schools to create environments that support healthy food choices and establish lifelong healthy eating habits.

3.6. Self check

1. Community health service workers can only provide general nutrition education to parents and caregivers, but cannot offer specific suggestions for healthy school lunch options.
2. Community health service workers are not able to advise parents and caregivers on avoiding sugary snacks and beverages in school lunches.
3. The passage states that community health service workers "can advise on avoiding sugary snacks and beverages and encourage parents to provide water as the main beverage option."

3. Community health service workers cannot collaborate with schools to organize wellness programs or events that promote healthy eating habits.

3.7. Adolescent Nutrition

Adolescence is a period of significant physical growth and development, making proper nutrition crucial during this stage. Community health service can educate adolescents and their parents about the increased nutritional needs during puberty and growth spurts.

They can emphasize the importance of consuming a well-balanced diet that includes adequate amounts of macronutrients and micronutrients. Community service can provide specific guidance on calorie requirements, protein intake, and the importance of consuming nutrient-dense foods to support optimal growth and development.

Addressing body image concerns and promoting a healthy relationship with food

Adolescence is also a time when body image concerns can arise. Community health service can play a critical role in addressing these concerns and promoting a healthy relationship with food. They can educate adolescents about the importance of body positivity and self-acceptance, emphasizing that health is more than just physical appearance. They can provide guidance on intuitive eating, encouraging adolescents to listen to their bodies' hunger and fullness cues and fostering a healthy attitude towards food. They can also address disordered eating behaviors or refer individuals to specialized professionals if needed.

Importance of calcium, iron, and other nutrients for bone health and growth:

Adolescence is a critical period for bone health and growth. Community service worker can educate adolescents and their parents about the importance of nutrients such as calcium, vitamin D, and phosphorus for optimal bone development. They can emphasize the role of dairy products, leafy greens, fortified foods, and sunlight exposure in meeting calcium and vitamin D needs. Additionally, healthcare professionals can highlight the importance of iron for adolescent girls due to menstruation and provide guidance on iron-rich food sources to prevent iron-deficiency anemia. They can also emphasize the importance of other nutrients such as vitamin C, zinc, and magnesium for overall growth and development.

Community health service workers can provide resources such as meal plans, educational materials, and referrals to registered dietitians or nutritionists to address specific nutritional needs and concerns during adolescence. By promoting proper nutrition, addressing body image concerns, and emphasizing the importance of key nutrients, they can support adolescents in achieving optimal health and well-being during this transitional period.

3.7. Self-check

1. What can community health service workers educate adolescents and their parents about during the adolescent stage?
2. What can community health service workers emphasize about a well-balanced diet during adolescence?
3. How can community health service workers address body image concerns and promote a healthy relationship with food during adolescence?
4. What nutrients do community health service workers emphasize as important for bone health and growth during adolescence?
5. What resources can community health service workers provide to address specific nutritional needs and concerns during adolescence?

3.8 Elderly Nutrition

Nutrition is crucial for maintaining health and quality of life in the elderly population. Aging is often associated with changes in appetite, metabolism, digestion, and nutrient absorption, which can increase the risk of malnutrition and related health issues. Elderly individuals may require modified diets to address specific conditions such as diabetes, hypertension, or dysphagia. Adequate protein intake is important to prevent muscle loss and maintain strength. Encouraging regular physical activity, promoting hydration, and addressing social and economic factors that may impact nutrition are also important considerations for elderly nutrition. Additionally, addressing age-related issues like dental health, medication interactions, and sensory changes can support optimal nutrition in the elderly population.

3.8 Self- check

1. Why is nutrition crucial for the elderly population?
2. What are some important considerations for elderly nutrition?

3. 9 Nutrition and Pregnancy-Related Conditions

Nutrition is crucial during pregnancy, as it impacts the health of the fetus. Pregnant women should manage their diet to prevent conditions like gestational diabetes and preeclampsia. Morning sickness can also affect nutrition, so providing frequent meals, staying hydrated, and using gentle remedies can help. A balanced, individualized diet and supplements can support a healthy pregnancy and promote optimal outcomes for both mother and baby.

3.9.1 Gestational diabetes and nutrition management:

Gestational diabetes is a condition that develops during pregnancy and affects how the body processes glucose. Community health service workers play a crucial role in managing gestational diabetes through nutrition. They can provide guidance on a balanced diet that helps control blood sugar levels, such as consuming a variety of carbohydrates, including whole grains, fruits, and vegetables, in moderation throughout the day. Community health service worker can also educate women about the importance of portion control, monitoring carbohydrate intake, and spreading meals and snacks evenly throughout the day. They may recommend consulting with a registered dietitian or nutritionist to develop an individualized meal plan based on the woman's specific needs.

3.9.2 Pre-eclampsia and dietary considerations:

Pre-eclampsia is a pregnancy complication characterized by high blood pressure and damage to organs, typically the liver and kidneys. While diet alone cannot prevent or cure pre-eclampsia, Community health service worker can provide dietary recommendations that may help manage the condition. They may advise women with pre-eclampsia to consume a well-balanced diet rich in fruits, vegetables, whole grains, lean proteins, and low-fat dairy products. They may also recommend limiting sodium intake and avoiding processed and high-sodium foods. Adequate hydration is also important, and healthcare professionals may recommend consuming enough water and fluids throughout the day. It's essential for women with pre-eclampsia to follow their healthcare provider's recommendations and receive appropriate medical care.

3.9.3 Nutrition for women with multiple pregnancies

Women carrying multiple pregnancies, such as twins or triplets, have additional nutritional needs compared to women with singleton pregnancies. Community Health service worker can provide guidance on meeting the increased calorie and nutrient requirements.

They may recommend a higher calorie intake, additional protein, and increased intake of certain nutrients such as iron, calcium, and folic acid. Healthcare professionals may also suggest more frequent monitoring of weight gain and nutritional status. In some cases, women with multiple pregnancies may be referred to a registered dietitian or nutritionist for personalized dietary guidance.

It's important for women with pregnancy-related conditions to work closely with their healthcare providers, including obstetricians, dietitians, and other specialists, to ensure appropriate management and support. Nutrition plays a significant role in managing these conditions, and healthcare professionals can provide tailored advice and support to promote the health and well-being of both the mother and the baby.

3.9 Self check

1. Nutrition plays a critical role during pregnancy and can significantly impact the health and development of the growing fetus.

2. Proper nutrition management is not essential for managing gestational diabetes, as long as the mother takes medication.

3. Consuming a well-balanced diet rich in fruits, vegetables, whole grains, lean proteins, and low-fat dairy can help manage pre-eclampsia.

4. Women carrying multiple pregnancies, such as twins or triplets, do not have any additional nutritional needs compared to women with singleton pregnancies.

5. Community health service workers can provide tailored advice and support to promote the health and well-being of both the mother and baby when it comes to pregnancy-related nutritional needs.

3.10 Nutrition and Childhood Obesity Prevention

Strategies for promoting healthy eating and physical activity in children:

Promoting healthy eating and physical activity habits in children is crucial for preventing childhood obesity.

Community health service workers can provide strategies to parents, caregivers, and educators to encourage healthy behaviors. Some strategies include:

Encouraging a balanced diet:

Community health service workers can educate parents and caregivers about the importance of providing a variety of nutrient-rich foods, such as fruits, vegetables, whole grains, lean proteins, and healthy fats. They can offer practical tips on meal planning, portion control, and reducing the consumption of sugary snacks and beverages.

Promoting regular family meals:

Healthcare health service workers can emphasize the benefits of regular family meals, where parents and children eat together. Family meals provide an opportunity for role modeling healthy eating behaviors, fostering positive relationships with food, and creating a supportive environment for trying new foods.

Encouraging physical activity:

Healthcare professionals can provide guidance on age-appropriate physical activities that promote strength, endurance, and flexibility. They can encourage parents and schools to limit sedentary behaviors, such as excessive screen time, and promote outdoor play, sports, and active hobbies.

Role of parents, schools, and communities in combating childhood obesity:

Combating childhood obesity requires a collaborative effort from parents, schools, and communities. Community health service workers can educate parents, schools, and community leaders about their roles in promoting healthy behaviors:

- Parents play a crucial role in providing a healthy home environment, making nutritious food choices, and being positive role models for their children. Community health can offer resources and support to parents, including nutrition education, cooking classes, and guidance on managing screen time and promoting physical activity at home.

- Schools can contribute to childhood obesity prevention by implementing nutrition policies that improve the quality of school meals and snacks, providing nutrition education, and promoting physical activity during school hours. Healthcare professionals can advocate for evidence-based nutrition programs in schools and collaborate with school staff to support healthy eating initiatives.
- Community Health service workers can work with community organizations, local governments, and businesses to create environments that support healthy lifestyles. This can include initiatives such as community gardens, farmers' markets, safe recreational spaces, and policies that limit the availability and marketing of unhealthy foods and beverages near schools.

Creating a supportive environment for healthy lifestyle choices:

- To prevent childhood obesity, it is essential to create a supportive environment that reinforces healthy lifestyle choices. Community health service workers can provide guidance on creating such an environment by:

- Providing education: they can educate parents, schools, and communities about the importance of nutrition, physical activity, and the risks of childhood obesity. They can offer evidence-based resources, workshops, and counseling sessions to support behavior change.
- Collaboration and partnerships: they can collaborate with schools, community organizations, and local authorities to develop and implement comprehensive strategies for childhood obesity prevention. This may involve coordinating efforts to improve access to healthy foods, promote physical activity, and establish supportive policies and programs.
- Addressing barriers: Healthcare workers can help identify and address barriers to healthy behaviors, such as food insecurity, lack of access to affordable healthy foods, or limited recreational facilities. They can support initiatives that increase access to nutritious foods and physical activity opportunities, particularly in underserved communities. Implementing these strategies and fostering collaboration among parents, schools, communities, and healthcare professionals, it is possible to create an environment that promotes healthy eating and physical activity, ultimately reducing the prevalence of childhood obesity.

3.10. Self check

1. What are some strategies that community health service workers can provide to parents, caregivers, and educators to encourage healthy eating and physical activity habits in children?
2. How can community health service workers educate parents and caregivers about the importance of providing a variety of nutrient-rich foods for children?
3. What role can community health service workers play in advocating for evidence-based nutrition programs in schools and collaborating with school staff to support healthy eating initiatives?

Unity Summary

This unit provides a comprehensive exploration of the role of nutrition throughout the human lifespan, from fetal development to old age. Learners will examine how proper maternal nutrition supports the growth and development of the fetus, as well as the overall health of the mother during pregnancy. The unit then delves into the crucial nutrients that foster physical growth, brain development, and immune function in infants during their first year of life, followed by an identification of the essential nutritional requirements for supporting the rapid growth and development of toddlers and preschoolers.

The analysis then shifts to school-age children, investigating how nutrition impacts their physical maturation, cognitive function, and overall wellbeing. Finally, the unit assesses the critical nutritional needs required to promote health, independence, and prevent diseases in the elderly. By achieving these objectives, learners will gain a comprehensive understanding of the pivotal role nutrition plays in facilitating optimal development and health at every stage of the human lifespan.

Unit review questions

1. Explain how proper maternal nutrition during pregnancy supports fetal development and maternal health.
2. Describe the key nutrients that support growth, brain development, and immune function in infants during their first year of life.

3. Identify the essential nutritional requirements needed to foster the rapid growth and development of toddlers and preschoolers.

4. Analyze the impact of nutrition on the physical growth, cognitive function, and overall health of school-age children.

5. Assess the critical nutritional needs required to promote health, independence, and prevent diseases in the elderly population.

6. Compare and contrast the unique nutritional needs and considerations across the different stages of human development covered in this unit.

7. Discuss strategies for ensuring adequate nutrition is provided to support optimal development and health at each stage of the lifespan.

8. Evaluate the long-term consequences of poor nutrition during key developmental periods, such as fetal development, infancy, and childhood.

9. Explain the role of nutrition education and counseling in empowering individuals and families to make informed decisions about their health and wellbeing.

10. Recommend ways that healthcare providers, community Health service worker policymakers, and community organizations can collaborate to improve nutritional outcomes across the lifespan.

UNIT 4

Common Nutritional Problems

4.1. Introduction

Problems with nutrition cover many difficulties that people encounter at different phases of their lives. These issues have significant effects on health and wellbeing, ranging from poor prenatal nutrition that causes pregnancy difficulties to the increased incidence of malnutrition among the elderly. Unhealthy eating practices, such as consuming excessive amount of processed foods that are high in sugar and bad fats, add to the global burden of obesity and diet-related illnesses. Food insecurity is still a major issue, with millions of people globally lacking access to enough nourishing food. A variety of methods, including as education, policy initiatives, and healthcare tactics focused at encouraging healthy eating habits and guaranteeing fair access to nutrient-dense food sources, are needed to address these prevalent issues.

Unit out comes

- Identify micronutrient deficiencies in different age level
- Identify macronutrient deficiencies in different age level
- Promote strategies for addressing nutrient deficiencies

Key terms: diet-related illnesses, Food insecurity

4.2 Micronutrient Deficiencies in Children and Adolescents

Micronutrient deficiencies in children and adolescents can have significant impacts on their growth, development, and overall health. Common micronutrient deficiencies include iron, vitamin D, and iodine. Let's explore each of these deficiencies and their impacts:

Iron Deficiency: Iron is crucial for the production of hemoglobin, which carries oxygen to the body's tissues. Iron deficiency can lead to anemia, characterized by fatigue, weakness, and impaired cognitive function. In children and adolescents, iron deficiency can hinder growth and development, impair learning abilities, and weaken the immune system.

Vitamin D Deficiency: Vitamin D plays a vital role in calcium absorption and bone health. Insufficient vitamin D levels can lead to rickets in children, causing weak and brittle bones. Vitamin D deficiency can also impact immune function and increase the risk of respiratory infections.

Iodine Deficiency: Iodine is essential for the production of thyroid hormones, which regulate metabolism, growth, and development. Iodine deficiency can result in impaired cognitive function, stunted growth, and goiter (enlargement of the thyroid gland).

To address micronutrient deficiencies, it is important to focus on dietary sources of key micronutrients and implement strategies to improve their intake:

Zinc deficiency is a common nutritional problem, especially in developing countries. Causes can include inadequate dietary intake of zinc-rich foods like meat, poultry, seafood, and dairy, as well as malabsorption disorders, chronic diseases that increase zinc requirements, and alcoholism. Symptoms of zinc deficiency include growth retardation in children, impaired immune function, taste and smell abnormalities, slow wound healing, and skin rashes. Severe zinc deficiency can lead to more serious issues like hair loss, diarrhea, impotence, and mental lethargy. Treatment generally involves increasing dietary zinc intake or taking oral zinc supplements.

Vitamin A deficiency is the leading cause of preventable blindness in children globally, and is most common in developing countries with inadequate intake of vitamin A-rich foods like liver, eggs, dairy products, orange/yellow fruits and vegetables, and dark green leafy vegetables. Causes include not only inadequate dietary intake, but also malabsorption disorders, increased requirements during pregnancy/breastfeeding, and chronic illnesses like measles, HIV/AIDS, or severe diarrhea. Symptoms range from night blindness and dry eyes to increased risk of infections and impaired growth and development. Severe vitamin A deficiency can lead to total blindness (xerophthalmia) and increased mortality. Treatment typically involves administering oral vitamin A supplements, especially for vulnerable populations like children and pregnant/breastfeeding women.

4.2.1. Dietary Sources for micronutrients

Iron: Good sources of dietary iron include lean meats, poultry, fish, legumes (such as beans and lentils), fortified cereals, and leafy green vegetables.

Vitamin D: The primary source of vitamin D is sunlight. Additionally, fatty fish (like salmon and mackerel), fortified dairy products, eggs, and mushrooms contain vitamin D.

Iodine: Iodized salt, seafood, seaweed, and dairy products are rich sources of iodine.

4.2.2. Strategies for Addressing Deficiencies

Nutrition Education: Educating parents, caregivers, and children about the importance of a balanced diet and the specific foods that provide key micronutrients can help address deficiencies.

Food Fortification: Fortifying staple foods (such as cereals, flour, and salt) with micronutrients can be an effective strategy to reach a large population and address deficiencies on a broader scale.

Supplementation: In some cases, when dietary intake is insufficient or when there is an increased need for specific nutrients, supplementation may be recommended under the guidance of healthcare professionals.

4.2.3. Importance of Supplementation and Fortified Foods

Supplementation and fortified foods play a critical role in addressing micronutrient deficiencies, especially in populations where access to diverse and nutritious foods is limited. They can provide an additional source of key micronutrients to help meet the recommended daily intake. However, it's important to note that supplements should not replace a well-balanced diet but rather complement it.

It is crucial to consult healthcare professionals, such as pediatricians or dietitians, for personalized advice and guidance on addressing specific micronutrient deficiencies in children and adolescents.

4.2 Self-check

1. What are the impacts of iron deficiency in children and adolescents?
2. What are some dietary sources of vitamin D?

4.3. Macro-nutrient Deficiencies in Children and Adolescents

Macronutrients are the nutrients that are required in larger quantities by the body, namely carbohydrates, proteins, and fats. Deficiencies in these macronutrients can have significant impacts on the growth, development, and overall health of children and adolescents.

Carbohydrate Deficiency: Carbohydrates are the primary source of energy for the body. Inadequate intake of carbohydrates can lead to low energy levels, fatigue, and impaired physical

and cognitive performance. Children and adolescents may experience difficulty in meeting their energy needs, resulting in poor growth and development.

Protein Deficiency: Proteins are essential for growth, tissue repair, and the synthesis of enzymes and hormones. Inadequate protein intake can result in stunted growth, delayed puberty, and compromised immune function. It may also lead to muscle wasting, weakness, and impaired cognitive function.

Fat Deficiency: Dietary fats are crucial for the absorption of fat-soluble vitamins, the production of hormones, and the maintenance of cell membranes. Insufficient fat intake can hinder the absorption of essential nutrients, impair brain development, and compromise the immune system. It can also lead to dry skin, poor wound healing, and deficiencies in fat-soluble vitamins like vitamin A, D, E, and K.

4.3.1. Strategies for Addressing Macronutrient Deficiencies

To address macronutrient deficiencies in children and adolescents, it is important to focus on the following strategies:

Balanced Diet: Encouraging a well-balanced diet that includes a variety of foods from different food groups can help ensure an adequate intake of all macronutrients. This includes consuming whole grains, fruits, vegetables, lean meats, fish, dairy products, legumes, and healthy fats.

Caloric Adequacy: Children and adolescents have higher energy requirements due to their growth and development. Ensuring an adequate calorie intake is essential to meet their energy needs and support proper growth and development.

Protein-Rich Foods: Including good sources of protein in the diet such as lean meats, poultry, fish, eggs, dairy products, legumes, and nuts can help meet the protein requirements of children and adolescents.

Healthy Fats: Including sources of healthy fats, such as avocados, nuts, seeds, olive oil, and fatty fish, can help ensure an adequate intake of essential fatty acids and support proper growth and development.

Monitoring and Education: Regular monitoring of growth and development, along with nutrition education for parents, caregivers, and children, can help raise awareness about the importance of macronutrients and promote healthy eating habits.

It is important to note that individual dietary needs may vary, and it is advisable to consult healthcare professionals, such as pediatricians or dietitians, for personalized advice and guidance on addressing specific macronutrient deficiencies in children and adolescents. Such as Marasmus and Kwashiorkor.

Marasmus: is severe under nutrition a deficiency in all the macronutrients that the body requires to function, including carbohydrates, protein and fats. Marasmus causes visible wasting of fat and muscle under the skin, giving bodies an emaciated appearance.

Figure. 3.1. Marasmus

Kwashiorkor is a disease marked by severe protein malnutrition and bilateral extremity swelling. It usually affects infants and children, most often around the age of weaning through age 5. The disease is seen in very severe cases of starvation and poverty-stricken regions worldwide.

Figure. 4.2. Kwashiorkor

Self-check 4. 3

1. What are some consequences of protein deficiency in children and adolescents?
2. Why is it important to include sources of healthy fats in the diet of children and adolescents?

Unit Summary

Nutritional issues significantly impact individuals at various life stages, from prenatal periods causing pregnancy complications to increased malnutrition among the elderly. Unhealthy eating habits, such as consuming excessive processed foods high in sugar and unhealthy fats, contribute to the global burden of obesity and diet-related illnesses. Food insecurity remains a pressing concern, with many lacking accesses to nutritious food. Addressing these issues requires a multifaceted approach involving education, policy initiatives, and healthcare strategies to promote healthy eating and ensure access to nutrient-rich foods.

Micronutrient deficiencies, including iron, vitamin D, and iodine, have severe effects on the growth, development, and overall health of children and adolescents. Iron deficiency can lead to anemia, causing fatigue, cognitive impairment, and hindered growth. Vitamin D deficiency can result in rickets, weak bones, and a compromised immune system, while iodine deficiency can impair cognitive function and cause stunted growth and goiter. Addressing these deficiencies involves promoting dietary sources rich in these nutrients, such as lean meats, fatty fish, iodized salt, and fortified foods. Strategies like nutrition education, food fortification, and supplementation are essential for improving micronutrient intake.

Macronutrient deficiencies, including carbohydrates, proteins, and fats, can also have significant impacts. Carbohydrate deficiency leads to low energy and poor growth, protein deficiency results in stunted growth and a weakened immune system, and fat deficiency impairs nutrient absorption and brain development. Addressing these deficiencies requires ensuring a balanced diet with adequate caloric intake, rich in protein and healthy fats from sources like lean meats, legumes, nuts, and avocados.

Regular monitoring and nutrition education are crucial for promoting healthy eating habits and ensuring proper growth and development. Specific conditions like marasmus and kwashiorkor highlight severe cases of undernutrition, requiring targeted nutritional interventions.

Additionally, zinc and vitamin A deficiencies pose significant health risks, emphasizing the importance of increasing dietary intake or supplementation to prevent severe health issues.

Unit Review questions

Part I – Say true if the statement is correct say false if the statements incorrect

1. Unhealthy eating habits, such as consuming excessive processed foods high in sugar and unhealthy fats, contribute to the global burden of obesity and diet-related illnesses.
2. Micronutrient deficiencies in children and adolescents, such as iron, vitamin D, and iodine, do not have significant impacts on their growth, development, and overall health.
3. Addressing macronutrient deficiencies in children and adolescents involves ensuring a balanced diet with adequate caloric intake and including sources of healthy fats and proteins.
4. Marasmus is a condition characterized by severe protein malnutrition causing bilateral extremity swelling, often affecting infants and young children.
5. Food insecurity is no longer a major issue globally, with most people having access to enough nourishing food.

Part II- Matching-column ‘A’ the deficiency with’ B’ its description

Column A	**Column B**
1. Iron Deficiency	A. Severe under nutrition causing emaciation and visible wasting of fat and muscle.
2. Vitamin D Deficiency	B. Results in rickets, weak bones, and impacts immune function.
3. Iodine Deficiency	C. Leads to low energy levels, fatigue, and impaired physical and cognitive performance.
4. Carbohydrate Deficiency	D. Results in anemia, characterized by fatigue, weakness, and impaired cognitive function.

5. Protein Deficiency	E. Causes impaired cognitive function, stunted growth, and goiter.
6. Fat Deficiency	F. Leads to stunted growth, delayed puberty, and compromised immune function.
7. Marasmus	G. Impairs nutrient absorption, brain development, and compromises the immune system.
8. Kwashiorkor	H. Causes severe protein malnutrition and bilateral extremity swelling.

UNIT 5

Assessment of Common Nutritional Status

5.1 Introduction

Community nutrition is a field that focuses on promoting healthy dietary habits and addressing nutritional needs within a specific community. It recognizes that nutrition is influenced by social, economic, and environmental factors and aims to improve the overall health and well-being of the population. Poor dietary practices, limited access to nutritious foods, and disparities in food availability contribute to diet-related diseases.

Community nutrition interventions involve assessing community needs, identifying gaps, and implementing targeted programs to improve food access and educate individuals about healthy eating. Community health workers play a crucial role in conducting nutrition assessments, providing education and support, and collaborating with stakeholders. By working together, community nutrition interventions can have a significant impact on improving community health and preventing diet-related diseases.

Unit outcomes

- Promote community nutrition needs assessment
- Identify ABCD nutrition needs assessment
- Promote policies that support access to healthy foods
- Identify strategies to address food insecurity
- Promote nutrition education
- Apply impact assessment for evaluation

Key terms: Poor dietary practices, nutrition assessments, diet-related diseases

5.2 Community Nutritional Status Assessment

Nutritional assessment involves evaluating an individual's dietary intake, anthropometrics, biochemical indicators, and clinical evaluations. This method helps healthcare providers identify nutritional imbalances and deficiencies, enabling tailored interventions for optimal health outcomes.

5.2.1 Conducting community nutrition assessments

Community health workers play a vital role in conducting community nutrition assessments. They should engage with community members to gather information about their dietary practices, food preferences, and cultural considerations. This can be done through interviews, surveys, focus groups, or observations. Community health workers should be trained to use appropriate assessment tools and techniques to collect accurate and reliable data. They should also consider the socioeconomic, cultural, and environmental factors that may influence nutrition in the community.

5.2.2 Identifying nutritional gaps and disparities

Community health workers should analyze the data collected during the nutrition assessments to identify nutritional gaps and disparities within the community. This involves comparing the community's current dietary practices and nutritional status with established dietary guidelines and health indicators. By examining the data, they can identify specific areas where the community may be lacking essential nutrients or facing disparities in access to healthy foods. This information helps inform targeted interventions and programs to address these gaps and disparities.

5.2.3 Collecting data on community food access and dietary habits

Community health workers should collect data on community food access and dietary habits to gain a comprehensive understanding of the local food environment. They can assess the availability, affordability, and quality of different types of food outlets in the community, such as grocery stores, farmers' markets, and convenience stores.

Additionally, they can explore community members' dietary habits, including the consumption of fruits, vegetables, whole grains, and processed foods. This data helps identify barriers to

accessing nutritious foods and informs strategies to improve food access and promote healthier dietary habits.

Note: Community health workers play a crucial role in assessing community nutrition needs. By conducting comprehensive nutrition assessments, they can gather data on dietary practices, identify nutritional gaps, and disparities and collect information on community food access. This information serves as a foundation for designing and implementing effective nutrition interventions and programs that address the specific needs of the community. Community health workers should receive appropriate training and support to carry out these assessments accurately and ethically.

Self-check 5.2

1. What is the role of community health workers in conducting community nutrition assessments?
2. How do community health workers identify nutritional gaps and disparities?
3. What type of data do community health workers collect regarding community food access and dietary habits?

5.3 Nutritional Assessment ABCD

A. Anthropometric Assessment

Anthropometric assessment involves measuring and evaluating various physical characteristics of an individual to assess their nutritional status. This includes measurements such as height, weight, body mass index (BMI), waist circumference, and skin fold thickness. These measurements provide valuable information about body composition, growth patterns, and potential nutritional deficiencies or excesses.

Anthropometric measurements refer to the objective assessment of various physical characteristics of the human body. These measurements provide quantitative data on dimensions, proportions, and composition, which can be used to evaluate growth, development, and nutritional status. Height measurement is one of the key anthropometric measurements used to assess linear growth in individuals of all ages.

Different positions, such as standing height, sitting height, and recumbent length, are used depending on the age and physical abilities of the individual. Accurate and standardized anthropometric measurements play a vital role in fields such as health, nutrition, sports, and research, providing valuable information for monitoring growth, identifying nutritional deficiencies, and assessing overall well-being.

To measure height in different positions, you can follow these methods:

Standing Height:

- Ask the individual to stand against a wall or a flat surface without shoes.
- Ensure that their heels, buttocks, and upper back are in contact with the wall.
- Instruct the person to look straight ahead with their head positioned in a natural, upright posture.
- Place a ruler or measuring tape vertically on top of the individual's head, ensuring it is perpendicular to the floor and making contact with the highest point of the head.
- Record the measurement in centimeters or inches.

Recumbent Length (Used for Infants and Young Children):

- Lay the infant or young child on a flat, horizontal surface, such as an infant length board or measuring mat.
- Ensure that the child is lying straight with their head positioned in a neutral alignment.
- Align the measuring device with the child's head and extend it to measure the length from the crown of the head to the heels.
- Record the measurement in centimeters or inches.

Remember to follow proper measurement techniques and ensure accuracy by using standardized measuring tools. It is also important to consider any adjustments needed for the positioning of the individual being measured, depending on their age and physical abilities

To measure weight accurately, follow these steps:

- Ensure that the weighing scale is on a flat and stable surface.
- Set the scale to zero or make sure it is calibrated properly.

- Ask the individual to remove any heavy objects, shoes, or outer clothing that could affect the measurement.
- Instruct the individual to step onto the scale, ensuring they are centered and balanced.
- Ask the individual to stand still and avoid leaning or touching any objects for stability.
- Wait for the scale to stabilize and display the final weight measurement.
- Read and record the weight measurement displayed on the scale.
- Ensure that the unit of measurement (e.g., kilograms, pounds) is correctly recorded.

It is important to note that weight measurements can fluctuate throughout the day, so it is recommended to measure weight at the same time each day for consistency. Additionally, when monitoring weight changes over time, it is advisable to use the same scale and measure under similar conditions to obtain accurate and comparable results.

To calculate the Body Mass Index (BMI), follow these steps:

- Measure the individual's weight in kilograms (kg).
- Measure the individual's height in meters (m).
- Square the height measurement (height in meters multiplied by height in meters).
- Divide the weight measurement by the squared height measurement.
- The resulting value is the body mass index.

The formula for calculating body mass index is:

BMI = weight (kg) / (height (m) * height (m))

By using this formula and following these steps, you can calculate an individual's BMI, which is a measure commonly used to assess body weight and determine if someone is underweight, normal weight, overweight, or obese.

To measure the mid-upper arm circumference), measuring mid-upper arm circumference is commonly done to assess nutritional status and identify individuals who may be at risk of malnutrition or have low muscle mass. It is particularly useful in low-resource settings where more complex measurements may not be feasible. It follows these steps**:**

- Position the individual in a seated or standing position with their arm relaxed and hanging by their side.
- Locate the midpoint of the upper arm, which is typically measured between the tip of the shoulder (acromion process) and the tip of the elbow (olecranon process).
- Using a flexible measuring tape, wrap it around the midpoint of the upper arm, ensuring that it is snug but not constricting or digging into the skin.
- Make sure the measuring tape is parallel to the ground and aligned with the landmarks of the midpoint of the upper arm.
- Read the measurement in centimeters (cm) at the point where the end of the measuring tape overlaps with the rest of the tape.
- Record the measured value as the mid-upper arm circumference mid-upper arm circumference

Measuring Head Circumference

Measuring head circumference is the process of determining the distance around a person's head, typically done for infants and young children as part of their routine health and development assessments. Head circumference is the distance around the widest part of the head, usually just above the eyebrows and ears. It is an important measurement for monitoring a child's growth and brain development.

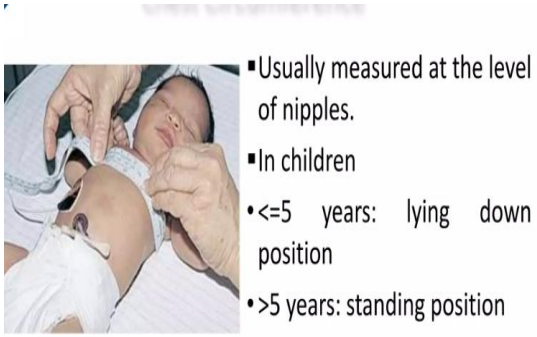
The Purpose of measuring head circumference Tracking head growth over time provides information about a child's physical and neurological development.
Head circumference measurements are compared to standardized growth charts to identify potential issues like microcephaly (abnormally small head) or macrocephaly (abnormally large head).

Steps to measure head circumference for children

- Gather the necessary materials: a non-stretch measuring tape and a well-lit, flat surface where the child can sit or lie down comfortably.
- Position the child. Have the child sit or lie down with their head in a neutral position, looking straight ahead.

- Find the appropriate landmarks. Locate the fullest part of the child's head, which is usually just above the eyebrows and ears.
- Place the measuring tape. Wrap the measuring tape around the child's head, ensuring it sits just above the eyebrows and ears. The tape should be level all the way around the head.
- Measure the circumference. Pull the tape snug, but not too tight, and read the measurement. Record the measurement to the nearest 1/8 inch or 0.1 cm.
- Repeat the measurement. Take the measurement two or three times to ensure an accurate reading.
- Compare to growth charts. Compare the child's head circumference measurement to standard growth charts to determine if it falls within the normal range for their age and gender.

N.B. It's important to use a soft, flexible, non-stretch measuring tape and to take the measurement when the child is calm and cooperative for the most accurate results.



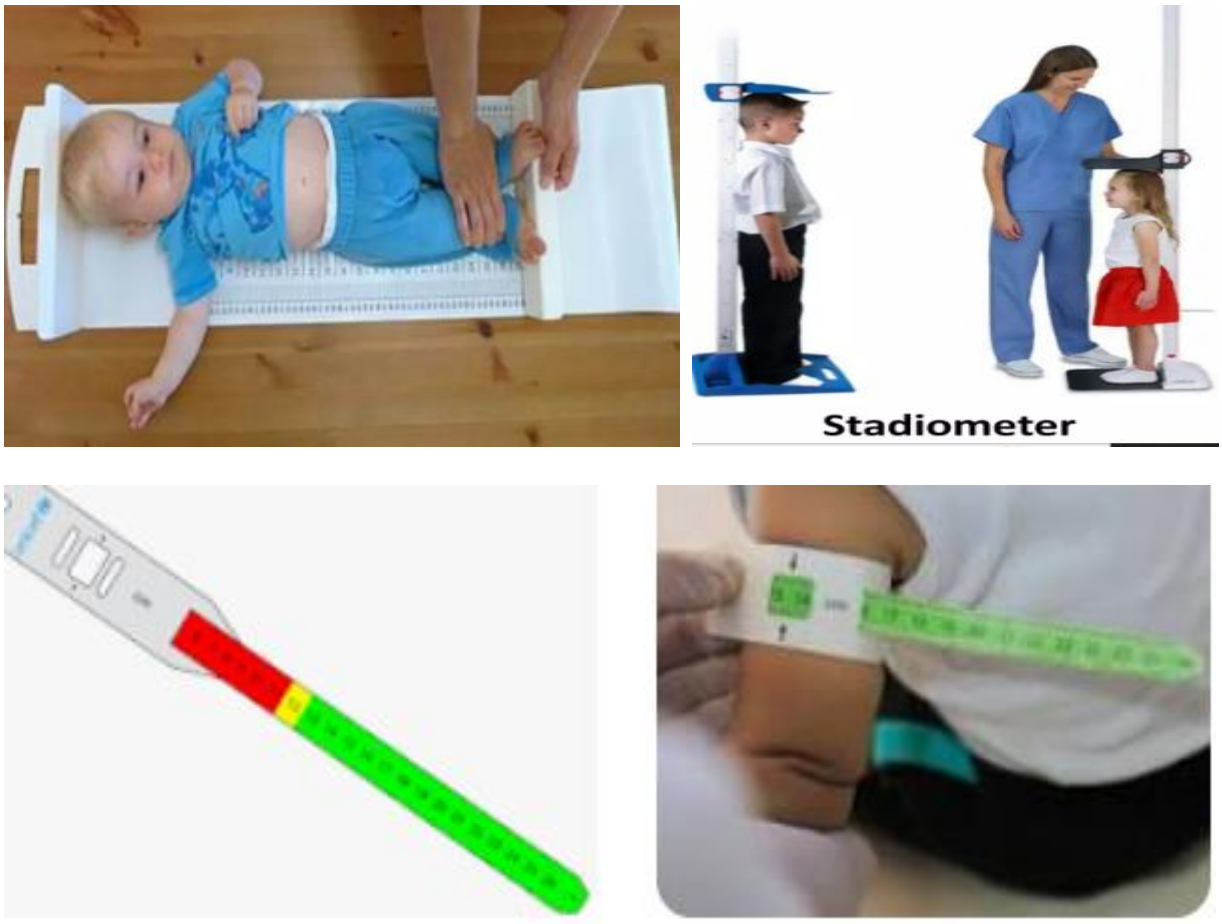


Figure.5.1 different anthropometric of body

B. Biochemical Assessment

Biochemical assessment involves analyzing blood, urine, or other biological samples to evaluate specific indicators of nutritional status. This may include measuring levels of essential nutrients, such as vitamins, minerals, and proteins, as well as markers of inflammation or metabolic function. Biochemical assessments can help identify nutrient deficiencies or imbalances and provide insight into overall metabolic health.

C. Clinical Assessment

Clinical assessment involves a thorough examination of an individual's physical signs and symptoms that may indicate nutritional deficiencies or medical conditions related to nutrition. This may include assessing the skin, hair, nails, oral health, and gastrointestinal symptoms. Clinical assessments can help identify signs of malnutrition, vitamin deficiencies, or other health conditions that may affect an individual's nutritional status.

D. Dietary Assessment

Dietary assessment involves gathering information about an individual's dietary intake to evaluate their nutritional adequacy and identify any dietary imbalances or deficiencies. This can be done using various methods, such as food diaries, 24-hour recalls, or food frequency questionnaires. Dietary assessments provide insights into an individual's eating habits, nutrient intake, and potential areas for improvement in their diet.

Self -check 5.3

1. What does the "B" in the ABCD assessment of nutritional assessment stand for?
2. Which component of the ABCD assessment involves evaluating physical signs and symptoms related to malnutrition?
3. What type of measurements are included in the "A" component of the ABCD assessment?
4. Which component of the ABCD assessment involves assessing dietary intake and eating habits?

5.4. Addressing Food Insecurity

Food insecurity, the lack of consistent access to sufficient and nutritious food, is a pressing issue affecting communities worldwide. Addressing food insecurity requires a comprehensive and multi-faceted approach. By understanding the impact of food insecurity on community health, implementing strategies to improve food access and affordability, and collaborating with local organizations to establish food assistance programs, communities can work towards alleviating food insecurity and promoting better health outcomes for all members of the community. To effectively address food insecurity, several key strategies can be implemented:

5.4.1. Understanding the impact of food insecurity on community health

- Conduct assessments to determine the prevalence and severity of food insecurity within the community.
- Analyze the impact of food insecurity on various aspects of community health, including physical health, mental well-being, child development, and academic performance.
- Identify vulnerable populations, such as low-income families, seniors, and marginalized communities, who are at higher risk of food insecurity and its associated health consequences.

5.4.2. Implementing strategies to improve food access and affordability

- Promote the establishment of community gardens, urban farms, and farmers' markets to increase the availability of fresh, locally grown produce.
- Advocate for policies that support healthy food options in underserved areas, such as zoning regulations that encourage grocery stores to open in food deserts.
- Support initiatives that provide financial assistance or subsidies for low-income individuals and families to access nutritious foods.
- Encourage collaboration between local farmers, food producers, and retailers to create more affordable options for fresh and healthy foods.

5.4.3. Collaborating with local organizations to establish food assistance programs

- Work with food banks, nonprofit organizations, and community centers to develop and implement food assistance programs.
- Support the establishment of food pantries, soup kitchens, and community meal programs to provide immediate relief to individuals and families experiencing food insecurity.
- Collaborate with local schools to implement school meal programs, including breakfast and lunch programs, to address food insecurity among children.
- Engage with community organizations to raise awareness about available food assistance resources and ensure that individuals in need can access them.

Self-check 5.4

1. What are some key strategies for addressing food insecurity?
2. How can collaboration with local organizations help establish food assistance programs?
3. What are three strategies for promoting nutrition education and promotion?
4. How can data be collected and analyzed to assess program outcomes and impact?
5. What role can community health care workers play in evaluating and assessing community nutrition programs?

5.5 Nutrition Education and Promotion

Nutrition education plays a critical role in empowering individuals and communities to make informed and healthy food choices. By designing and delivering nutrition education programs, developing culturally appropriate materials, and engaging community members in nutrition promotion activities, communities can empower individuals to make healthier food choices and improve overall well-being. It is crucial to ensure that the education programs are relevant, accessible, and tailored to the specific needs and preferences of the target population. Regular evaluation and feedback from participants can help refine and enhance the effectiveness of nutrition education initiatives. To effectively promote nutrition education, consider the following strategies.

5.5.1. Designing and delivering nutrition education programs for diverse populations:

- Assess the specific needs and knowledge gaps of the target population regarding nutrition and healthy eating.
- Develop evidence-based nutrition education curricula tailored to the cultural, linguistic, and socioeconomic backgrounds of the community.
- Incorporate interactive and participatory teaching methods, such as cooking demonstrations, taste tests, and hands-on activities, to enhance engagement and understanding.
- Collaborate with healthcare providers, schools, community centers, and local organizations to deliver nutrition education programs in various settings.

5.5.2. Developing culturally appropriate educational materials and resources

- Create educational materials, such as pamphlets, brochures, and info graphics that are culturally sensitive and accessible to diverse populations.
- Consider language preferences, literacy levels, and visual representation to ensure effective communication and understanding.
- Provide practical and actionable information on topics such as balanced meal planning, label reading, portion control, and healthy cooking techniques.
- Utilize digital platforms and social media to disseminate nutrition information and reach a wider audience.

5.5.3. Engaging community members in nutrition promotion activities and workshops

- Organize community workshops, seminars, and cooking classes to promote nutrition knowledge and skills.
- Encourage community participation by involving local leaders, influencers, and community health workers in the planning and delivery of nutrition promotion activities.
- Foster peer-to-peer learning and support networks where community members can share experiences and success stories related to healthy eating.
- Collaborate with local farmers' markets or community gardens to promote access to fresh and locally grown produce.

5.6. Policy and Advocacy

Policy and advocacy efforts are crucial for creating an environment that supports access to healthy foods and promotes nutrition. Policy and advocacy work requires persistence, collaboration, and a long-term perspective. By advocating for policies supporting access to healthy foods, collaborating with policymakers and community leaders, and promoting nutrition initiatives at various levels, communities can create lasting changes that support healthier environments and improve population health outcomes.

Here are some strategies to consider:

5.6.1. Advocating for policies that support access to healthy foods

- Research and identify policies that can positively impact food access, such as zoning regulations, incentives for grocery stores in underserved areas, and restrictions on unhealthy food marketing.
- Collaborate with advocacy organizations, community groups, and healthcare professionals to build a coalition and amplify the collective voice in support of policy changes.
- Engage in grassroots advocacy efforts, such as letter-writing campaigns, petitions, and community forums, to raise awareness and generate public support for policies promoting healthy food access.

5.6.2. Collaborating with policymakers and community leaders to address nutrition-related issues:

- Establish relationships with local policymakers, government agencies, and community leaders to advocate for nutrition-related initiatives.
- Provide evidence-based research, data, and testimonials to support the case for policy changes that improve nutrition and public health.
- Participate in public hearings, town hall meetings, and policy forums to share expertise and perspectives on nutrition-related issues.
- Work collaboratively with stakeholders to develop and implement community-based interventions and programs that align with public health goals.

5.6.3. Promoting nutrition initiatives at the local, regional, and national levels

- Support or initiate grassroots initiatives that promote nutrition education, healthy food access, and food system sustainability within the community.
- Engage with local media outlets to raise awareness about nutrition-related issues and highlight successful programs or policy changes.
- Form partnerships with regional and national organizations focused on nutrition and public health to amplify advocacy efforts and share best practices.

- Monitor and stay informed about policy developments at the regional and national levels, and engage in advocacy efforts to promote evidence-based nutrition initiatives.

5.7. Evaluation and Impact Assessment

Evaluation and impact assessment are essential components of community nutrition programs to measure their effectiveness, identify areas for improvement, and make informed decisions. Evaluation and impact assessment provide valuable insights into the effectiveness and impact of community nutrition programs. By developing evaluation frameworks, collecting and analyzing data, and using evaluation findings to inform program improvements and decision-making, organizations can enhance the quality and impact of their nutrition initiatives and contribute to better health outcomes within the community. Here are some strategies for conducting evaluation and impact assessment:

5.7.1. Developing evaluation frameworks to measure program effectiveness

- Define clear goals and objectives for the community nutrition program, ensuring they are specific, measurable, achievable, relevant, and time-bound (SMART).
- Identify appropriate indicators and metrics to assess program outcomes, such as changes in knowledge, behavior, dietary habits, and health outcomes.
- Develop data collection tools, surveys, or questionnaires to gather information from program participants and stakeholders.
- Establish a timeline and plan for data collection, considering pre- and post-program assessments and follow-up evaluations to measure sustained impact.

5.7.2. Collecting and analyzing data on program outcomes and impact

- Implement data collection methods, such as surveys, interviews, focus groups, or observational studies, to gather quantitative and qualitative data.
- Ensure data collection processes are standardized, reliable, and valid, and maintain participant confidentiality and privacy.

- Analyze collected data using appropriate statistical methods and qualitative analysis techniques.
- Interpret findings to evaluate program effectiveness, identify strengths and weaknesses, and determine the impact on participants and the community.

5.7.3. Using evaluation findings to inform program improvements and decision-making

- Share evaluation findings with program stakeholders, including staff, partners, and funders, to communicate program outcomes and impacts.
- Identify areas for program improvement based on evaluation findings, such as modifying curriculum, adjusting program delivery methods, or targeting specific population groups.
- Use evaluation results to inform decision-making processes, such as resource allocation, program expansion, or policy advocacy.
- Continuously monitor and evaluate program implementation and outcomes to ensure ongoing improvement and adaptation. Community health care workers can play a vital role in the evaluation and impact assessment of community nutrition programs. Their involvement can contribute to the effectiveness and success of these initiatives in the following ways:

Data collection: Community health care workers can actively participate in data collection efforts by administering surveys, conducting interviews, or facilitating focus groups. They can engage with program participants and gather valuable information about their experiences, knowledge, behavior changes, and health outcomes. Their close connection to the community enables them to establish trust and rapport, which can lead to more accurate and reliable data collection.

Program monitoring: Community health care workers can play a role in monitoring the implementation of community nutrition programs. They can observe program activities, track attendance, and document any challenges or barriers faced by participants. This ongoing monitoring allows for the identification of issues that may affect program effectiveness and provides an opportunity for timely intervention and improvement.

Participant support and engagement: Community health care workers can provide support and guidance to program participants throughout the evaluation process. They can explain the purpose of data collection, address any concerns or questions, and encourage participation. By building relationships with participants, community health care workers can enhance engagement and ensure that diverse perspectives are captured during evaluation activities.

Program improvement: Community health care workers can actively contribute to program improvement efforts based on evaluation findings. They can provide valuable insights and recommendations based on their direct experience working with program participants. This input can inform adjustments to program content, delivery methods, or outreach strategies to better meet the needs of the community.

Advocacy and dissemination: Community health care workers can play a role in advocating for the utilization of evaluation findings to inform decision-making and program planning. They can communicate evaluation results to program stakeholders, policymakers, and community leaders, emphasizing the importance of evidence-based approaches and the impact of community nutrition programs on health outcomes. This advocacy can help ensure that evaluation findings are considered and integrated into future program development and funding decisions.

Overall, community health care workers are essential contributors to the evaluation and impact assessment of community nutrition programs. Their close connection to the community, knowledge of local contexts, and direct involvement in program implementation make them valuable partners in gathering data, monitoring program activities, supporting participants, and driving program improvement based on evaluation findings.

Unit Summary

Community nutrition programs have a general objective of improving the overall nutritional well-being and health outcomes of the community. These programs employ various strategies to achieve this objective. They start by conducting assessments to understand the community's nutrition needs, including dietary habits, food access, and disparities. Addressing food insecurity is a key focus, with efforts to improve food access and affordability through collaborations with local organizations and the implementation of supportive policies.

Nutrition education and promotion are essential components, as programs design and deliver educational initiatives tailored to diverse populations. Culturally appropriate materials and engaging activities are used to empower community members to make healthy food choices. Community-based interventions involve establishing gardens, supporting local food initiatives, and implementing healthy food options in schools, workplaces, and public spaces to increase access to nutritious foods.

Policy advocacy plays a vital role, with programs advocating for policies that support access to healthy foods and collaborating with policymakers and community leaders to address nutrition-related issues. Finally, evaluation and impact assessments are conducted to measure program effectiveness, collect data on outcomes and impacts, and use the findings to inform program improvements and decision-making.

Overall, community nutrition programs aim to enhance the quality and impact of their initiatives, ultimately improving the health and well-being of the community by addressing nutrition needs, promoting food security, providing education, implementing community-based interventions, advocating for supportive policies, and conducting evaluations.

Unit Review Questions

1. How can community nutrition assessments help identify dietary habits and food access within a community?
    A. By conducting surveys and interviews with community members
    B. By analyzing local food availability and affordability
    C. Both a and b
    D. None of the above

2. What strategies can be implemented to improve food access and affordability in communities?
    A. Implementing farmers' markets and community-supported agriculture programs
    B. Enhancing transportation options to improve access to grocery stores
    C. Increasing funding for nutrition assistance programs like food banks and food vouchers
    D. All of the above

3. How can culturally appropriate materials and resources enhance the effectiveness of nutrition education programs?
    A. By incorporating local food traditions and cultural preferences
    B. By using language and imagery that resonate with the target community
    C. By collaborating with community leaders and trusted local organizations
    D. All of the above
4. What are the benefits of establishing community gardens and promoting local food initiatives?
    A. Increasing access to fresh, locally grown produce
    B. Fostering community engagement and social cohesion
    C. Promoting sustainable food practices and environmental stewardship
    D. All of the above
5. Why is it important to advocate for policies that support access to healthy foods in the community?
    A. To address health disparities and reduce the risk of chronic diseases
    B. To promote equitable food access and improve community well-being
    C. To support local farmers and strengthen the local economy
    D. All of the above

Project work on Nutrition

Project-1

Observation Visit:

- Arrange a field trip to a local health center or clinic where students can observe the activities related to anthropometric measurements and maternal care.
- Instruct students to closely observe the healthcare professionals as they conduct anthropometric measurements on pregnant mothers.
- Encourage students to take notes on the techniques used, the equipment employed, and the interactions between healthcare providers and patients.

Shadowing healthcare providers:

- Coordinate with the health center or clinic to allow interested students to shadow healthcare providers during their routine activities.
- Assign each student or small group of students to shadow a healthcare provider involved in conducting anthropometric measurements.
- Students should actively observe and take note of the procedures, communication techniques, and challenges encountered by the healthcare provider.

Assisting with Anthropometric Measurements:

- Seek permission from the health center or clinic to allow students to assist in conducting anthropometric measurements under the supervision of healthcare providers.
- Assign students specific tasks, such as measuring height, weight, or MUAC, while closely following the instructions and guidance of the healthcare providers.
- Students should actively engage in the process, ensuring accuracy, and clarifying any questions or uncertainties they may have.

Data Collection and Analysis:

- Collaborate with the health center or clinic to facilitate data collection from pregnant mothers.
- Instruct students to collect anthropometric measurements, record the data accurately, and organize it for analysis.
- Guide students in analyzing the collected data, identifying trends, and interpreting the nutritional status of the pregnant mothers.

Reflective Journaling:

- Encourage students to keep a reflective journal throughout their observations and work at the health center.
- Students should reflect on their experiences, noting their observations, challenges faced, and lessons learned.
- Prompt students to contemplate the significance of anthropometric measurements in assessing maternal nutrition and the impact on maternal and fetal health.

Presentation and Discussion:

- Provide students with an opportunity to share their experiences and insights with peers.
- Ask students to prepare presentations summarizing their observations, work, and reflections at the health center.
- Organize a discussion session where students can present their findings, engage in dialogue, and collectively reflect on the importance of anthropometric measurements in maternal care.

Note: Ensure that all necessary permissions and protocols are followed when working at health centers. Students should maintain professionalism, respect patient privacy and confidentiality, and adhere to the guidance and instructions provided by healthcare providers.

Project.2.

Project Title: "Promoting Healthy Eating: Balanced Diet Menu Plan and Health Education in Schools

Project Description:

The objective of this project is to empower students to develop a balanced diet menu plan for a week and deliver health education sessions at a community setting, specifically schools. The project will focus on raising awareness about the importance of healthy eating habits and providing practical guidance on creating nutritious meals. Students will work collaboratively to design a menu plan and prepare educational materials to deliver engaging health education sessions to school students.

Project Objectives:

- Understand the principles of a balanced diet and the nutritional requirements for different age groups.
- Create a balanced diet menu plan for a week that meets the nutritional needs of school students.
- Deliver interactive health education sessions at schools to promote the importance of a balanced diet and provide practical tips for making healthier food choices.

Project Activities:

Menu Plan Development:

- Collaboratively design a balanced diet menu plan for a week, considering the nutritional
- Needs, taste preferences, and cultural factors of the target age group.
- Ensure the menu plan includes a variety of food groups, such as fruits, vegetables, whole grains, lean proteins, and dairy or dairy alternatives.
- Incorporate local, seasonal, and affordable food options into the menu plan.

Health Education Material Development:

- Create visually appealing and engaging educational materials, such as posters, pamphlets, and handouts that highlight the importance of a balanced diet and provide practical tips for making healthier food choices.
- Include information on portion control, reading food labels, and the benefits of eating a variety of foods.

Delivery of Health Education Sessions:

- Schedule visits to local schools and coordinate with teachers or school administrators to arrange health education sessions.
- Deliver interactive presentations or workshops to school students, utilizing the developed educational materials.
- Engage students in activities, games, or demonstrations to reinforce key messages about healthy eating habits.
- Encourage student participation and address their questions and concerns regarding nutrition and healthy eating.

Project Outcome:

The expected outcome of this project is to promote healthy eating habits among school students through the development of a balanced diet menu plan and the delivery of engaging health education sessions. By providing practical guidance and knowledge about nutrition, the project aims to empower students to make informed choices and adopt healthier eating habits.

Additionally, the project will enhance students' communication skills, teamwork, and understanding of nutrition education in a community setting.

Note: Ensure that all activities are conducted with the necessary permissions and coordination with the school authorities. Adhere to any dietary restrictions or guidelines provided by the schools or relevant institutions.

Answer keys for self-check questions

Unit 1

Self check 1.3

1. The food group with the most calories per gram is fats. With almost nine calories per gram, fats have the highest energy density of all the macronutrients. In contrast, the calories per gram of proteins and carbohydrates are approximately 4. Consequently, fat has the highest calorie density of any macronutrient.
2. Our body need macro nutrients in large quantity while micro nutrients in small quantity that is why we say micro and macro nutrient according to our body consumption.

Unit 2

Self-check question 2.2

1. A balanced diet is important for maintaining good health because it provides the body with the necessary nutrients it needs to function properly. It includes a mix of macronutrients (carbohydrates, proteins, and fats), a variety of fruits and vegetables for essential vitamins, minerals, and fiber, appropriate dairy or dairy alternatives, and adequate hydration. A balanced diet helps prevent chronic diseases and supports overall well-being.

Self-check 2.3

1. Practicing mindful eating and engaging in meal planning and preparation offer several benefits. Mindful eating promotes awareness and presence while eating, helping individuals savor and enjoy their meals while preventing overeating. Meal planning and preparation allow individuals to make healthier choices by selecting nutritious ingredients and controlling portion sizes. These practices can save time and money by reducing reliance on processed and convenience foods.

Additionally, reading and understanding food labels empowers individuals to make informed decisions about the nutritional content of packaged foods, enabling them to choose healthier options. By integrating these habits into their daily lives, individuals can prevent chronic diseases such as obesity, diabetes, and cardiovascular diseases, leading to improved overall health outcomes.

2. Good nutrition choices can prevent various chronic diseases, including diabetes, heart disease, obesity, high blood pressure, certain cancers, and osteoporosis. By making conscious decisions to consume a balanced and nutritious diet, individuals can significantly reduce the risk of developing these conditions. Proper nutrition plays a crucial role in maintaining overall health and well-being, and it is a key factor in preventing the onset of chronic diseases that can have long-term detrimental effects on one's health.

Unit 3 self check question answer

3.2. Self-check

1. False
2. False
3. True
4. False
5. False
6. False
7. False
8. False

3.3 Self check

1. D
2. D
3. A
4. A
5. A

3.4. Self-check

1. True
2. True
3. True
4. False
5. True

3.5 self-check

1. True
2. False
3. True
4. False
5. True

3.6 Self check

1. False
2. False
3. True

3.7. self- check

1. Increased nutritional needs during puberty and growth spurts
2 .Importance of consuming adequate macronutrients and micronutrients.
3. Educate on body positivity, provide intuitive eating guidance, and refer for disordered eating.
4. Calcium, vitamin D, phosphorus, and iron.
5. Meal plans, educational materials, and referrals to registered dietitians

3.8 .Self-check

1. Nutrition is crucial for the elderly population in order to maintain their health and quality of life. Aging is often associated with changes that can increase the risk of malnutrition, such as changes in appetite, metabolism, digestion, and nutrient absorption.

2. Some important considerations for elderly nutrition include:

- Providing modified diets to address specific health conditions like diabetes, hypertension, or dysphagia
- Ensuring adequate protein intake to prevent muscle loss and maintain strength

- Encouraging regular physical activity and promoting hydration
- Addressing social and economic factors that may impact nutrition
- Addressing age-related issues like dental health, medication interactions, and sensory changes.

3.9 Self-check

1. True
2. False
3. True
4. False
5. True

3.10 Self check

1. Community health service workers can provide strategies such as nutrition education, cooking demos, grocery store tours, and physical activity programs to encourage healthy habits in children.
2. Community health service workers can educate parents and caregivers about the importance of nutrient-rich foods by providing information on balanced diets, recommended servings, and age-appropriate portion sizes.
3. Community health service workers can advocate for evidence-based nutrition programs in schools and collaborate with staff to support initiatives like school gardens, taste tests, and nutrition curriculum.

Unit 4

Self-check 4.2

1. Iron deficiency can hinder growth and development, impair learning abilities, and weaken the immune system.
2. The primary source of vitamin D is sunlight. Additionally, fatty fish (like salmon and mackerel), fortified dairy products, eggs, and mushrooms contain vitamin D.

Self-check 4.3

1. Inadequate protein intake can result in stunted growth, delayed puberty, and compromised immune function. It may also lead to muscle wasting, weakness, and impaired cognitive function.

2. Because it helps to ensure an adequate intake of essential fatty acids and support proper growth and development.

Unit 5

Self-check 5.2

1. Community health workers play a vital role in conducting community nutrition assessments. They engage with community members to gather information about dietary practices, food preferences, and cultural considerations through interviews, surveys, focus groups, or observations. They use appropriate assessment tools and techniques to collect accurate and reliable data while considering socioeconomic, cultural, and environmental factors.
2. Community health workers analyze the data collected during nutrition assessments to identify nutritional gaps and disparities within the community. They compare the community's dietary practices and nutritional status with established guidelines and health indicators. By examining the data, they can identify areas where the community may be lacking essential nutrients or facing disparities in access to healthy foods, which helps inform targeted interventions and programs.
3. Community health workers collect data on community food access and dietary habits to gain a comprehensive understanding of the local food environment. They assess the availability, affordability, and quality of different types of food outlets in the community. They also explore community members' dietary habits, including the consumption of fruits, vegetables, whole grains, and processed foods. This data helps identify barriers to accessing nutritious foods and informs strategies to improve food access and promote healthier dietary habits.

Self -check 5.3

1. The "B" in the ABCD assessment stands for Biochemical measurements.
2. The "C" in the ABCD assessment stands for Clinical assessment.
3. Anthropometric measurements, such as height, weight, and body mass index (BMI), are included in the "A" component of the ABCD assessment.
4. The "D" in the ABCD assessment stands for Dietary assessment, which involves evaluating an individual's dietary intake and eating habits.

Self-check 5.4

1. Some key strategies for delivering effective nutrition education programs include assessing the specific needs of the target audience, using interactive and engaging teaching methods, incorporating practical and hands-on activities, providing culturally relevant and tailored information, and collaborating with community partners.
2. Community members can be engaged in nutrition promotion activities by involving them in the planning and decision-making process, utilizing community leaders and influencers as advocates, organizing community events and workshops, providing accessible and relevant resources, and fostering a supportive and inclusive environment.
3. Strategies for evaluating the effectiveness of community nutrition programs include setting clear objectives and goals, collecting and analyzing data on program outcomes and impact, conducting pre- and post-program assessments, engaging participants in feedback and evaluation processes, and utilizing qualitative and quantitative evaluation methods.
4. Some key strategies for delivering effective nutrition education programs include assessing the specific needs of the target audience, using interactive and engaging teaching methods, incorporating practical and hands-on activities, providing culturally relevant and tailored information, and collaborating with community partners.
5. Community members can be engaged in nutrition promotion activities by involving them in the planning and decision-making process, utilizing community leaders and influencers as advocates, organizing community events and workshops, providing accessible and relevant resources, and fostering a supportive and inclusive environment.

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Module VI
Non-Communicable Diseases

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Module Description

This student learning module is prepared to achieve the required competency focuses on knowledge, attitude and skills required to improve the life style of the community that will enable to prevent and control of common non-communicable disease. It also describes effective community based early detection (screening), appropriate health education to prevent each non-communicable disease, referral and follow up of cases.

Learning outcomes of the module

- Identify common non- communicable diseases
- Undertake screening

Follow up cases Key term: Lifestyle, Malignant tumor, benign tumor, Essential hypertension, gestational diabetes, Body mass index, Healthful housing, Palliative care

UNIT 1

Common Non-Communicable Diseases

1.1 Introduction

Non-communicable diseases (NCDs) are diseases that are not transmitted (spread) directly from one person to another. It is also known as lifestyle diseases or chronic diseases. The majority of these diseases are caused by the way people live and are preventable.

Learning outcomes:

After the accomplishing this unit the students will be able to:

- Describe the overview of non-communicable diseases
- List common non-communicable diseases
- Describe prevention methods for common non-communicable diseases

Key terms: transition, chronic diseases, non-communicable diseases

1.2. Overview of Non- Communicable Diseases

Non-communicable diseases, also known as chronic diseases, are diseases which are not transmitted from person to person. They are of long duration and generally slow progression. Non-communicable diseases are a growing international health challenge. It account for 71% of the total global deaths and more than half of the global burden of diseases. According to the 2019 World Health Organization report on world health statistics, its negative impact is highest for low and middle-income countries. It account for 78% of all deaths, 85% of premature deaths, and 50% of disabilities in these countries. Cardiovascular diseases (CVDs) contribute to the majority of non-communicable diseases -related mortalities in low and middle income countries, followed by cancers, respiratory diseases, and diabetes mellitus (DM).

In African nations deaths from non-communicable diseases are projected to exceed the combined deaths of communicable and nutritional diseases and maternal and peri-natal deaths as the most common causes of death by 2030 (WHO fact sheet, updated March 2013). Some non-communicable diseases are very common, which makes the global prevalence of non-communicable diseases very high.

The four main types of non-communicable diseases are cardiovascular diseases (like heart attacks, stroke and hypertension), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes. These four groups of diseases account for around 80% of all non-communicable diseases deaths. Cardiovascular diseases account for most NCD deaths, or 17.3 million people annually, followed by cancers (7.6 million), respiratory diseases (4.2 million), and diabetes (1.3 million).

Non-communicable diseases have been established as a clear threat not only to human health, but also to development and economic growth (World Economic Forum 2014). non-communicable diseases share four main behavioral risk factors, all of which will likely escalate in developing countries: tobacco use, harmful use of alcohol, insufficient physical activity, and unhealthy diet/obesity.

Non-communicable diseases and injuries burden and the concomitant risk factors in Ethiopia were retrieved from the global Burden of Disease (GBD). The GBD data showed that in 2017 44.4% of total mortality in Ethiopia was due to non-communicable diseases. Cardiovascular diseases and cancer constitute an estimated 43% of non-communicable diseases and injury mortality. Among individuals between the ages of 50–69 years, non-communicable diseases and injuries is a cause for 70% of the mortality.

Self check question 1.2

1. Are non-communicable diseases the concern of developing countries like Ethiopia? Why? Explain it.

1.3. Common Non- Communicable Diseases

The highest burden of non-communicable diseases can be attributed to chronic diseases which once known to be the ailments of affluence such as cardiovascular diseases, cancers, chronic respiratory illnesses, and diabetes which, respectively, account for 44%, 9%, 9%, and 4% of all non-communicable diseases -related deaths .The harmful use of alcohol, tobacco use, dietary behaviors, and physical inactivity are among behavioral risk factors for non-communicable diseases and raised blood pressure, raised blood glucose, and obesity are among established metabolic risk factors for it. It is projected that the burden of non-communicable diseases will continue to rise in low-income countries such that by the coming 2030.

The four main types of non- communicable diseases are cardiovascular diseases (like heart attacks, stroke and hypertension), cancers, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes.

1.3.1. Cardiovascular Diseases

Cardiovascular diseases are major health problems all over the world. They are a group of diseases that involve the heart and the blood vessels (arteries and veins). It involves:

- **Coronary heart disease**– disease of the blood vessels supplying the heart muscle;
- **Cerebro-vascular disease (Stroke)** – disease of the blood vessels supplying the brain;
- **Peripheral arterial disease** – disease of blood vessels supplying the arms and legs;
- **Rheumatic heart disease** – damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria;
- **Congenital heart disease** – malformations of heart structure existing at birth;
- **Deep vein thrombosis and pulmonary embolism** – blood clots in the leg veins, which can dislodge and move to the heart and lungs.

If there is an interruption of blood supply due to diseases of the vessels taking blood to the heart, the heart might be seriously damaged due to lack of oxygen and nutrients to fuel its muscular contractions. Medically this damage is referred to as a **heart attack**. If the same type of situation happens in the brain, and lack of oxygen disrupts the normal function of the brain, this is referred to as a **stroke**.

Heart attacks and strokes are usually **acute** life-threatening events (‘acute’ means they start suddenly and rapidly get worse). They are mainly caused by a blockage that prevents blood from flowing to parts of the heart or brain, which are seriously damaged by the lack of oxygen. The most common reason for the blockage is a build-up of fatty deposits (called *plaques*) on the inner walls of the blood vessels that supply the heart or brain. Strokes can also be caused by bleeding from a blood vessel in the brain or from blood clots blocking an artery.

The most common cardio-vascular diseases

A. Hypertension (high blood pressure)

The normal blood pressure of apparently health person is **120/80 mmHg**, but based on the age category this value might be fluctuated. Hypertension is defined as arterial blood pressure that exceeds **140/90mmHg** at several determinations. High blood pressure is medically known as **hypertension**. According to the national non-communicable diseases STEPS survey the overall prevalence of hypertension is 15%. There are many causes of hypertension, including kidney diseases, narrowing of the aorta (the biggest artery leaving the heart), diabetes, the excessive use of alcohol and some medical drugs. However, in most cases of hypertension the cause remains unknown and this is called *essential **hypertension***. A person with hypertension might have the following symptoms: headaches, blurring of vision, chest pain, nose bleeds and restlessness.

B. Heart failure

Heart failure is when the heart cannot pump efficiently and is unable to generate sufficient blood flow to meet the demands of the body for oxygen and nutrients, either at rest or during exercise.

Acute heart failure occurs rapidly, typically as a result of heart attack. Chronic heart failure occurs more slowly, building up through time due to disease of the heart or blood vessels leading from the heart. A person with heart failure is usually short of breath even when sitting still; they breathe faster than normal and may 'gasp' for breath if they do anything that requires strength or movement. They often cannot sleep without using many pillows because, if they lie down, the blood that cannot be pumped away from the heart collects in the vessels in the chest, which makes them even more breathless. They also complain of tiredness and weakness.

1.3.2 Risk factors for cardiovascular diseases

Do you know some risk factors leading to cardio vascular diseases?

Risk factors for hypertension

Having a high level of fat (cholesterol) in the blood, old age, poor nutrition, being overweight or obese, excessive alcohol intake, diabetes, taking oral contraceptive pills for many years, being physically inactive and, most importantly, being a cigarette smoker- are all risk factors for hypertension. Most of these factors are preventable by teaching the community to change their behavior to healthier ways.

Risk factors for Heart failure

The most important risk factors for heart disease and stroke are unhealthy diet, physical inactivity and tobacco use. These are called **behavioral risk factors** because they are due to people's behavior; these factors are responsible for about 80% of cardiovascular diseases.

Self check questions 1.3.1

1. What could a person *stop* doing in order to reduce their risk of developing hypertension?
2. List the common symptoms of hypertensive person.

A. Hypertension prevention

Individual approach:

- Health education (dietary, behavioral and physical activity)
- Screen for hypertension if suspected
- Refer cases to the nearest health facility for further diagnosis and management
- Regular follow up of cases

Community approaches to decrease the risk of Hypertension:

Community education to reduce the salt intake in their diet, reduce excess weight gain (Obesity), regular exercise, minimize alcohol intake and avoiding of smoking.

Dietary approach to stop hypertension (DASH):

- Maintain a healthy weight.
- Be physically active on most days of the week
- Follow a healthy eating plan, which includes foods lower in salt and fats.
- If you drink alcoholic beverages, do so in moderation.
- If you have high blood pressure and are prescribed medication, take it as directed

B. Heart Failure

Simple ways of preventing heart attack and stroke are:

- Ensure that all above 30 years of age are screened annually for hypertension and diabetes.
- Blood pressure and blood sugar should be monitored regularly in high-risk individuals

- Motivate those with high blood pressure and high blood sugar to change their lifestyle
- Create awareness among the community on the warning signs of heart attack and stroke and these are both preventable and treatable.
- Create awareness among the community on the services available for early management of heart diseases and stroke in health facilities.

1.4 Cancer

What is a cancer?

Tumor occurs when abnormal cells form a mass (swelling) with in a tissue or within an organ. There are two main types of tumor: **Malignant** (cancerous) **tumor** and **benign tumor**. Cancer is the name given to malignant or cancerous tum-or. Cancerous tumor has the capacity to grow rapidly and to metastasize or spread to other tissues. Some tumors like leukemia grow as cell suspensions but most grow as solid masses of tissue.

Cancer is not a singular, specific disease but a group of variable tissue responses that result in uncontrolled cell growth (McCance & Roberts, 1998; Fraumeni, 1982). Healthy tissues are composed of cells. Healthy cells have a specific size, structure, function and growth rate that best serves the needs of the tissues they compose. Cancer cells differ from normal cells in size, structure, function, and growth rate. These malignant cells lack the normal controls of growth seen in healthy cells, and grow uncontrollably. This uncontrolled growth allows the cancer cells to invade adjacent structures and then destroy surrounding tissues and organs.

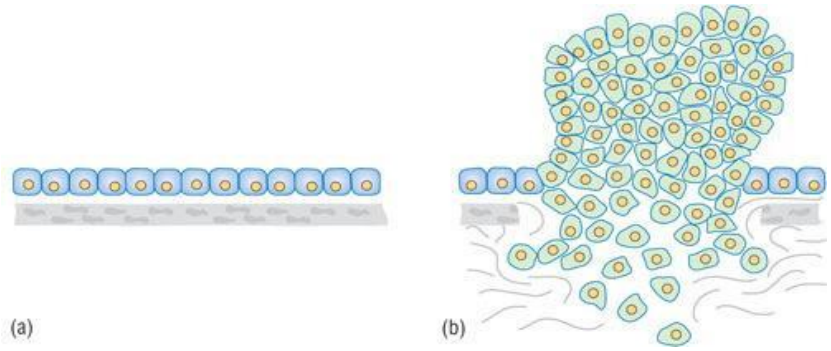

Figure 1.1: (a) normal Cells. (b) Cancer cells grow uncontrollably

1.4.1 Common types of cancer

There are many types of cancer, and they are named by the body part involved or the type of body cells involved; for example, cervical cancer, breast cancer, brain tumor, lung cancer, colon cancer, prostate cancer, skin cancer and lymphoma. The symptoms of cancer vary depending on the parts of the body involved. In Ethiopia there are no official data on cancer rates, but hospital reports suggest that cancer of the female cervix may be the leading type, followed by breast cancer. Two common public health important types of cancer are:

A. Breast cancer:

The cause of most **breast cancers** is unknown. Genetic factors are involved in about 2% of cases, and women who are obese and/or eat a high fat diet, or drink a lot of alcohol are more at risk, but there is no clear cause in most cases. However, benign (harmless) lumps in the breast are very common, so you need to reassure women in your community that every change and every lump found in the breasts does not mean they have breast cancer. Only about one in every five women with a breast lump turns out to have cancer. The breasts are changing every month with the phases of the menstrual cycle, due to changes in the levels of the female reproductive hormones (oestrogen and progesterone), and sometimes these changes result in *temporary* lumps in the breast. Some women develop small painless lumps just before their menstrual period, which disappear after a few days. Sometimes a small tender cyst develops (a collection of fluid in the breast), which also disappears after a few days. If a lump is felt in the breast that remains for two weeks, it is wise to get it checked by a health professional.

Common warning signs for breast cancer are:

- Lump in the breast or underarm area (armpit).
- Thickening or swelling of part of the breast.
- Irritation or puckering/dimpling of breast skin.
- Redness or flaky skin in the nipple area or the breast.
- Pulling in of the nipple or change in position or shape and pain in the nipple area.
- Nipple discharge other than breast milk, including blood.
- Any change in the size or the shape of the breast.

- Constant pain in any area of the breast or armpit.

B. **Cervical cancer:**

Cervical cancer refers to cancer cells growing in the tissues of the cervix – the muscular organ connecting the uterus and the vagina. Most cases of cervical cancer are caused by sexually transmitted infection with the human papilloma virus

In low- and middle-income countries, cervical cancer is the most common female cancer and one of the leading causes of death amongst women. In Ethiopia believed that cervical cancer is the second most common of all cancers next to breast cancer which encompass 23% of all cancers. It is usually a slow-growing cancer that may not produce symptoms in its early stages.

1.4.2 Common Signs and Symptoms of cervical cancer

Encourage any woman with the following symptoms to seek urgent medical attention.

- Vaginal bleeding between periods
- Menstrual periods that are longer or heavier than usual
- Post-menopausal bleeding
- Bleeding after sexual intercourse
- Pain during sexual intercourse
- Smelly vaginal discharge
- Unusual vaginal discharge tinged with blood
- Backache
- Lower abdominal pain
- Fatigue/extreme tiredness
- Unexplained weight loss
- Pain in legs
- Pain during urination

1.4.3 Risk factors for cancer

Risk factor refers to any condition, behavior or factor that increase the occurrence of a health problem. Knowing the risk factors of cancer is helpful in educating your community in how they can *decrease* the occurrence by changing their behavior.

A. Risk factors for breast cancers

The followings are among the factors increase risk of breast cancer:

- Family History
- Early onset of menstrual period (before age 12 years)
- Late age at first child birth (after age 30 years)
- No pregnancy- never having a full-term pregnancy
- Shorter duration or no breastfeeding
- Late menopause (after age **55** years)
- Previous treatment using radiation therapy
- Being overweight/obese especially after menopause
- Smoking and second-hand smoke
- Lack of physical activity
- Consumption of alcohol

B. Risk factors for cervical cancers:

The followings are among the factors increase risk of cervical cancer:

- Human papilloma virus infection
- Smoking
- Young age at first sexual activity
- Multiple sexual partners
- Unprotected sex or poor sexual hygiene
- Early marriage
- Early child birth- in women younger than 17 years

- Frequent child birth
- Weakened immune system such as HIV/AIDS

1.4.4 Cancer prevention methods

A. Cancer prevention through risk reduction strategies

You can teach your community members how to reduce their risk of developing cancer by avoiding certain behaviors and habits.

- Avoid cigarette smoking or chewing tobacco or *khat* (they increase the risk of cancers of the mouth, throat, lungs, stomach, colon and bladder)
- Avoid excessive alcohol usage (which is a risk factor for cancers of the mouth, esophagus, stomach, breast and liver)
- Eat a healthy diet containing plenty of fruits, vegetables and other high-fiber foods from plant sources like whole grains, peas and beans (this helps in reducing cancer risks in the whole of the gastrointestinal system)
- Maintain a healthy weight (this reduces the risk of many cancers, including cancers of the ovaries and breast)
- Avoid exposure to industrial chemicals by wearing personal protective clothing (this reduces the risk of lung and skin cancers, among others)
- Avoid exposure to cancer-promoting viruses (hepatitis B virus (HBV) causes liver cancer, and human papilloma-virus (HPV) causes cancer of the cervix).

B. Prevention of cancers caused by viruses

Infection with two viruses is strongly associated with the development of specific cancers:

- Hepatitis B virus causes liver cancer,
- Human papilloma virus causes cancer of the cervix.

Both these viruses can be transmitted by unprotected sexual intercourse. hepatitis B virus infection can follow from exposure to the blood of an infected person, e.g. during healthcare. Immunization against hepatitis B virus is a routine part of the Expanded Programme on

Immunization (the EPI) in Ethiopia; three doses are given to all infants as part of the penta-valent vaccine (penta-valent means that five different vaccines are combined in one injection). Some high-income countries also offer immunization with a vaccine against human papiloma virus. It is also introduced to Ethiopia now a day.

The **ABC rules used to prevent other sexually transmitted infections (STIs) such as abstinence** (refraining from sexual intercourse), be faithful (to one long-term partner) condoms (correct and consistent use of condoms for all acts of sexual intercourse) are the best way to prevent cervical cancer due to human papiloma virus**.**

Self check questions: 1.4.2

1. Which form of cancer has the capacity to grow rapidly and to metastasize or spread to other tissues?
2. Which virus is responsible for occurrence of cervical cancer?

1.5 Diabetes Mellitus

Diabetes mellitus is a condition in which the level of **glucose** (the simplest type of sugar) in the blood is poorly controlled, so that sometimes it rises too high and at other times it falls too low. Both these extremes can have serious consequence, for the health of person. The normal range is **75-115 mg** (milligrams) of glucose in every 10 ml of blood.10 ml is called a 'deciliter' (dcl); blood glucose levels are usually expressed in mg/dcl of blood. Glucose control is due to the action of hormones. *Insulin* and *glucagon* are the two most important hormones involved in the control of blood glucose levels.

Diabetes is currently becoming a common problem in developing countries like Ethiopia; the National non-communicable disease STEPS survey demonstrated a prevalence of diabetes in adults to be 3.2% (3.5% males and 3.0% females) in Ethiopia.

Types of diabetes:

The two most common types of diabetes are named as type 1 and Type 2 diabetes. Worldwide, about 90% of people with diabetes have Type 2 and about 10% have Type 1. But Gestational diabetes accounts for very small numbers of cases during pregnancy.

A. Type 1diabetes (insulin-dependent diabetes) is caused because of pancreas fails to produce enough insulin due to the destruction of the cells that make insulin. Without enough insulin, glucose

cannot enter the tissues and cells, and so the blood glucose level rises damagingly high. People with Type 1 diabetes are dependent on taking insulin every day – either in tablet form or injecting it.

Due to lack of insulin the body breaks down fats and protein to use as fuel. As a result, the person often loses weight very rapidly due to loss of fluid, an inability to use glucose as a fuel, loss of muscle as protein is broken down, and loss of glucose in the urine. A person with Type 1 diabetes should never stop taking their insulin, even when they are unwell and not eating. Type 1 diabetes can develop at any age, although it most commonly begins in children and young adults.

C. **Type 2 diabetes (**non-insulin-dependent diabetes):is caused because of the pancreas still produces insulin, though the amount reduces over time. The main problem is that the body cells become increasingly resistant to the action of insulin, so it does not stimulate the cells sufficiently to take up glucose from the blood. Type 2 diabetes may be present for many years before a diagnosis is made, because some people have few symptoms or take no notice of them, e.g. they may not see their thirst or getting up at night to pass urine as a problem.

Having Type 2 diabetes for several years before a diagnosis is made can mean that complications of diabetes, which take years to develop, may already be present at the time of diagnosis.

Although it is most often a condition that develops in adults, particularly those aged over 40 years, it is beginning to be diagnosed in younger adults and even in teenagers who are obese. The amount of insulin that is produced in someone with Type 2 diabetes often decreases over a period of years, and eventually insulin treatment is required. Treatment generally starts with changes in the amounts and types of food eaten and an increase in physical activity, before progressing to tablets and then onto insulin injections.

1.5.1 Signs and Symptoms of Type 2 Diabetes

- Frequent urination
- Increased hunger
- Excessive thirst
- Unexplained weight loss
- Lack of energy, extreme tiredness
- Lack of interest and concentration
- Blurred vision

- Repeated or severe infections such as vaginal infections
- Slow healing of wounds, dry or itchy skin
- Impotence in men

If the blood glucose stays too high and is not treated on time, it can cause damage to the main organs such as: kidneys, heart, blood vessel, nerves (Neuropathy), eyes (Retinopathy) and Oral cavity. All these problems can be prevented if detected early.

C. Gestational diabetes

A pregnant woman can develop diabetes in pregnancy, due to chemical changes in her body. This is known as **gestational diabetes** (also known as pregnancy-induced diabetes). The common symptoms are the same as for Type 1 and Type 2 diabetes (thirst, frequent urination), but she may also complain of itching and an unpleasant smell coming from her vagina due to infection, and wounds that are slow to heal.

Gestational diabetes commonly goes away after the baby is delivered, but you should be aware that a few mothers will have undiagnosed Type 2 diabetes, or have developed coincidental Type 1 diabetes. During the pregnancy, the woman should be treated for diabetes by changes to her diet and exercise, with or without prescribed insulin.

Diabetes in pregnancy may give rise to several adverse outcomes:

- Congenital malformations
- Increased birth weight
- An elevated risk of prenatal mortality

The status of blood glucose and its description:

Based on WHO criteria **100-125 mg/dl** fasting blood sugar)FBS) is impaired fasting glucose(IFG),while FGS of greater than **126 mg/dl** is considered as diabetic, and referred to health institutes. If the check up is random capillary blood sugar **140 mg/dl** is diabetic and referred to health institution.

1.5.2. Risk factors for diabetes:

It is important to have a good understanding of the **risk factors** associated with diabetes. Knowing these risk factors can help you make a diagnosis, especially of Type 2 diabetes, and introduce treatment at an early stage.

Risk factors for type 1 diabetes:

There is some indication that a virus infection in early childhood might lead to Type 1 diabetes in some cases; the theory is that the virus in some way causes the person's own immune system to destroy the insulin-producing cells in their pancreas. Common viruses associated with type one diabetes are retroviruses such as Coxsackie virus B (CVB), Rota virus, Mumps virus and cytomegalo virus).

Risk factors for type 2 diabetes:

- A family history of diabetes (genetic factors).
- Being overweight or obese; the distribution of body fat also appears to be important, with fat around the abdomen seen as more of a risk than fat hips.
- Lack of exercise.

1.5.3. Prevention methods of diabetes

For primary prevention: Life style modification (Using healthy diet, doing physical exercise) and regular check up is the basic prevention method especially for type 2 diabetes.

For secondary prevention: Using insulin as per the recommendation, use of anti-diabetic drugs, and checking the status of blood sugar level regularly is important prevention mechanisms.

Self check questions 1.5

1. What are the two common types of hormones regulating blood glucose level in human being?
2. What are the adverse outcomes of gestational diabetes?
3. List types of viruses which are expected the cause for type 1 diabetes.

1.6. Chronic Obstructive Pulmonary Disease (COPD) and Bronchial Asthma

What are COPD? What is bronchial asthma?

Chronic obstructive pulmonary disease and bronchial asthma are very common **respiratory diseases** (i.e. affecting the respiratory system) all over the world, including in Ethiopia. Patients with Chronic obstructive pulmonary disease are usually in the older age groups and have a combination of two clinical conditions –*emphysema* and *chronic bronchitis*. Bronchial asthma is an allergic reaction to particles getting into the lungs from the environment. Although it can

affect all ages, it is the most common chronic disease among children. The studies shown that nearly 460 million people, or slightly more than one in every 20 people, suffered from chronic respiratory *diseases* in 2019. Asthma accounts 60%(262 million) from the total chronic respiratory *diseases*.

According to estimates by the WHO, about 235 million people have asthma worldwide, and 210 million people have Chronic obstructive pulmonary disease. Millions more have these or other undiagnosed chronic respiratory diseases. Asthma is not often fatal, but about three million people die of chronic obstructive pulmonary disease every year and experts predict that it will become the third leading cause of death worldwide by the year 2030.

A. Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease is a progressive respiratory disease that makes it hard to breathe.

A **chronic disease** is one that begins slowly, gradually gets worse over time and lasts for a long time, usually for the rest of the person's life. Obstructive means that the disease involves blockages (obstructions) somewhere in the body, and 'pulmonary' tells you that the disease affects the respiratory (or pulmonary) system.

The lungs in Chronic obstructive pulmonary disease**:** People with Chronic obstructive pulmonary disease have inflammation in their lungs that causes the production of large amounts of mucus – a clear slimy fluid secreted by cells lining the inside of the lungs. The mucus is a very good place for bacteria to grow, so lung infections are common in people with chronic obstructive pulmonary disease. The mucus blocks the fine bronchioles and causes wheezing – squeaky breathing; you can often hear a quiet whistling or squeaking sound coming from the lungs when the person breathes in.

Table 1.1. Common signs and symptoms of chronic respiratory diseases

Signs / symptoms	Explanation
Chronic cough	Cough for a month or longer
Shortness of breath	Shortness of breath (short wind) or difficulty breathing
Chronic mucus production	Mucus, also called sputum production lasted a month or longer
Wheezing	Wheezing or noisy breathing

Chronic chest pain	Unexplained chest pain that lasts for a month or more, especially if it gets worse when breathing or coughing

Emphysema and chronic bronchitis:

The symptoms we have just described are known as **chronic bronchitis** (‘bronk-eye-tuss’). Because the airways are constantly irritated and inflamed, the lining of the bronchioles becomes thicker and the space in the middle of the tube becomes smaller . This further restricts the amount of air that can get into and out of the lungs.

People with Chronic obstructive pulmonary disease also develop a condition called **emphysema** (‘em-fee-see-mah’). Persistent coughing stretches these delicate structures so much that over time they lose their elastic quality and become stiff. This means that they don’t expand as easily to let air enter.Also, the walls between many of the alveoli (air sacs) are destroyed by the high pressure inside the air sacs when a cough fails to dislodge a mucus obstruction. This damage leads to fewer larger air sacs instead of many tiny ones (see the bottom right diagram in Figure: 1.2). If this happens, the amount of gas exchange in the lungs is reduced.

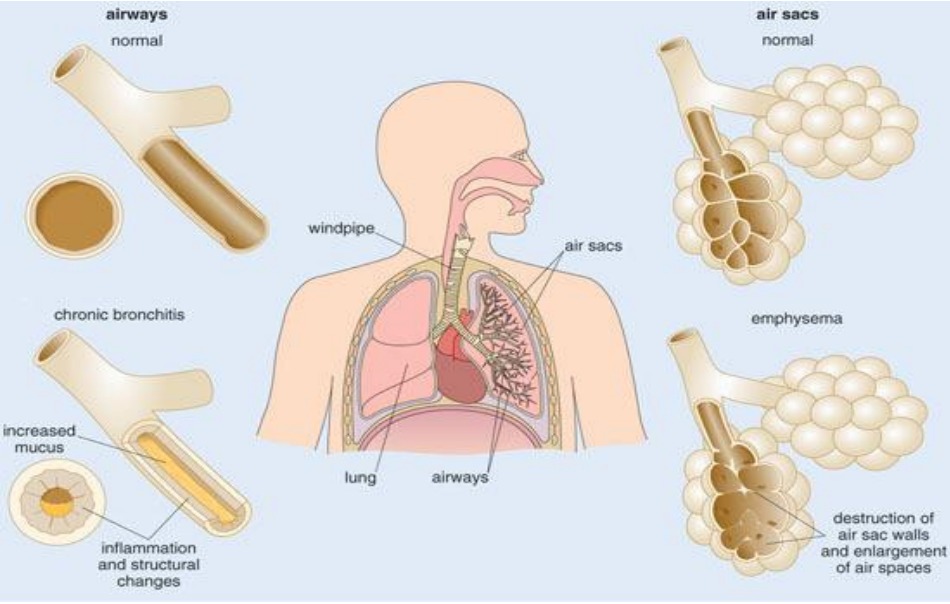

Figure: 1.2. (Top) Normal airways and alveoli (air sacs). (Bottom left) Airways blocked with mucus and (bottom right) alveoli damaged by Chronic obstructive pulmonary disease.

1.6.1 Risk factors for chronic obstructive pulmonary disease:

Age is a risk factor for chronic obstructive pulmonary disease: most people who have chronic obstructive pulmonary disease were at least 40 years old when their symptoms began. However, the main risk factor is smoking tobacco. People who have a family history of chronic obstructive pulmonary disease (older relatives who developed it) are also more likely to develop the disease if they smoke. Long-term exposure to other lung irritants is another risk factor for chronic obstructive pulmonary disease. These include:

- Second hand-smoke from someone who is smoking tobacco in the same house every day
- Industrial air pollution (smoke, chemical fumes and dust)
- Indoor smoke from cooking fires especially when dried animal dung used in developing countries.

Bronchial Asthma

Asthma is common health problem in Ethiopia, affecting **1.5-3%** of total population. Bronchial asthma is a common lung disease affecting millions of people worldwide. Like chronic obstructive pulmonary disease, it is characterized by narrowing of the airways (bronchioles) in the lungs, but there are some major differences. First, bronchial asthma is an **allergic reaction** to certain particles in the air, known by the general term **allergens**, which usually come from other animals or plants. Examples of allergens include:

- Pollen from trees, crops and flowers
- House dust mites (microscopic crawling animals that live in house dust and feed on the flakes of skin that humans shed every day)
- Animal hairs (especially domestic animals like cats, dogs and horses)

The muscles in the walls of the bronchioles constrict (become narrow) if a person with asthma breathes in an allergen that he or she has become sensitive to. Most people are not sensitive to these common allergens, so people who develop bronchial asthma may have genetic factors that make their lungs react so strongly. The narrowing of the bronchioles can begin very suddenly and is called an **asthma attack**. The symptoms of an asthma attack are similar to chronic

obstructive pulmonary disease and include wheezing, coughing, chest tightness and shortness of breath.

Risk Factors for Asthma:

In addition to allergens factors that worsen acute asthma symptoms are: smoke, atmospheric pollution, some chemicals, and bacterial and viral infections, and emotional stress and worry etc.

1.6.2. Prevention of Chronic obstructive pulmonary disease and Bronchial Asthma

A. Prevention of Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease is a preventable disease. Educate people in your community how they can protect themselves from developing Chronic obstructive pulmonary disease. Some preventive measures are as follows:

- Stop smoking and stay away from second-hand smoke.
- Avoid indoor and outdoor air pollution.
- Avoid exposure to people who have the flu or other viral infections.
- Exercise regularly – do 30 minutes brisk walk daily.
- Eat a healthy, balanced diet.
- Maintain a healthy weight.
- See your doctor for an annual medical physical check-up.

B. Prevention of bronchial asthma

- Identify asthma triggers and symptoms
- Create allergy-proof environment
- Avoid smoking
- Get vaccination for flu
- Perform physical exercise regularly
- Adhere to asthma medication

Self check question 1.6

1. List common risk factors for occurrence of chronic obstructive pulmonary disease?

1.7 Mental Health Problems

Do you think mental health is common problem in public health?

Mental health is states of well-being in which an individual can realize his/her own abilities, interact positively with others, cope with the stressors of life and study, work productively and fruitfully, and contribute to his/her family and community. Mentally healthy person shows growth and maturity cognitive, emotional, and social processes.

Mental illness is states of disturbance in which an individual can not realize his/her own abilities, interact negatively with others, cannot cope with the stressors of life and study, not work productively and fruitfully, and not contribute to his/her family and community mentally ill person acts in ways that deviate from socially and culturally acceptable manners. Mental health problems vary in degree or severity from a mild illness that causes limited suffering to severe conditions that cause marked distress to the person with the illness and their families. The more extreme and distressing disorders are simply termed severe mental illness (SMI). Individuals with SMI are those with an illness that severely restricts their day-to-day activities, such as working in the fields, attending expected community activities like funerals, and carrying out their family responsibilities.

Mental illness comprised 13% of the total global burden of disease in 2000 (a figure that is expected to rise to 15% by the year 2020). Depression is the third leading cause of disease burden worldwide. In Ethiopia, mental illness is the leading non-communicable disorder in terms of burden. The disability associated with mental illness in Ethiopia is high. Stigma, discrimination and human rights abuses are part of the daily lived experience of the mentally ill and their families in Ethiopia.

Have you experienced people in your locality with the following conditions?

- Physical complaints that don’t seem to have a medical cause
- Worries that seem too much
- Difficulty with sleep

A. Physical complaints without an identifiable medical cause

It is a common experience in primary healthcare that a person comes with a physical complaint but no medical cause can be found. The most common explanations for this situation are:

- A medical cause is actually present, but can't be detected with the facilities available.
- The physical complaint is due to undetected depression or anxiety.

The physical complaint is due to **somatisation** (mental or social distress) due to chronic poverty, marital problems etc. comes out as a physical symptom. Often the person doesn't realize that this is happening. For example, a woman who is distressed because she is not able to get pregnant may develop a chronic headache as a result of her distress.

Studies from Ethiopia have shown that around one in five people attending a general medical out-patient clinic with a physical symptom actually have an undetected mental health problem. It is important to recognize when a person's physical health complaint is being caused by an underlying mental health problem, otherwise there is a risk that they will repeatedly attend health services without getting relief. They may spend a lot of money on traditional treatments that don't help, or may receive inappropriate treatment or investigations; for example, they may be given anti-malarial medication for a headache that is actually caused by depression. Ultimately, they continue to suffer and be disabled because they don't get the treatment they really need.

Common somatization symptoms in Ethiopia are:

- Burning sensations on the head or body
- Buzzing in ears
- Crawling sensations under the skin
- Stabbing/pricking pains
- Fluid in the head
- Back pain.

B. Anxiety disorders: worries that seem too much

Anxiety disorders occur when a person worries without sufficient reason. There is normal and abnormal worry.

Some examples for **Normal worry** could be: a student worrying on the night before an exam, a woman worrying about her child who is ill, or a man worrying about how he can provide for the family after the crops have failed.

Some examples of ***Abnormal* worry** (an anxiety disorder) could be a student who worries all the time, even when their exam results are good, a woman who worries constantly about her child even though the child is healthy and happy, and a man who worries about the harvest even when the crops are growing well.

Anxiety can be distressing, disabling and preventing people doing things that they used to. It also lead to physical symptoms (Tremor/shaking, Sweating, Poor digestion, Tense muscles, Heart racing) Anxiety often goes hand-in-hand with **depression** (Loss of appetite, Weight loss, Fatigue, Low energy, Headache). Also, people who are worrying too much may use alcohol and *khat* as a way of trying to cope with their symptoms. Although this might help them to feel better in the short term, alcohol and *khat* usually make anxiety worse in the longer term.

C. Difficulty with sleep (insomnia)

Common causes of sleeping problems include: bad sleeping habits, undetected mental illness such as depression, anxiety, psychosis, social problems such as somebody has died, not enough food for the family, stimulants or other drugs (coffee, alcohol, *khat*, prescribed medications), a physical health problem (e.g. painful conditions, diabetes, breathing problems, epilepsy), late pregnancy, having a young child, something in the environment (uncomfortable sleeping place, cold, noisy).

Sleep problems can be very frustrating and distressing. People with sleep problems are more likely to be involved in road accidents because they are tired and don't concentrate properly. Sleep problems can also lead to mental illness or make mental illnesses worse. People may try to treat their sleep problems through self-medication, either with sedative medication (usually diazepam) or alcohol. **Sedative medication** is medication that makes a person feel sleepy. Both alcohol and diazepam can lead to addiction and, instead of solving the sleep problem, can make it worse. Because of all these reasons, it is important to take sleep problems seriously

1.7.1. Risk Factors of Mental Health Problems

Although the exact causes of most mental illnesses are not known, it is becoming clear through research that many of these conditions are caused by a combination of biological, psychological and environmental factors.

Genetic factors such as abnormalities in chromosomes may cause mental illness. Children from mentally ill parents are more likely to develop mental illnesses than children of healthy parents.

Organic factors like cerebro-vascular diseases, nervous system diseases, endocrine diseases and chronic illnesses such as epilepsy are associated with mental illnesses.

Social and environmental crises like poverty, tension, emotional stress, occupational and financial difficulties, unhappy marriage, broken homes, abuse and neglect, population mobility, frustration, changes in life due to environmental factors like earthquakes, flood and epidemics are associated withmental illness. Environmental factors other than the psychosocial ones capable of producing abnormal human behaviour include toxic substances such as carbon monoxide, mercury, manganese, tin, lead compounds, etc.

Psychological factors like early childhood experiences of abuse and other psychological trauma during childhood play an important role in the development of mental illness in adult life.

Behavioral factors like addicting in drugs, alcohol and substances like khat are associated with mental illness.

Other factors associated with mental illness include nutritional deficiency; infections before and after delivery and birth trauma; road, occupational and other accidents; and radiation accidents. The nervous system is most sensitive to radiation during the period of neural development.

Major causes for mental illness

The bio-psycho social model:

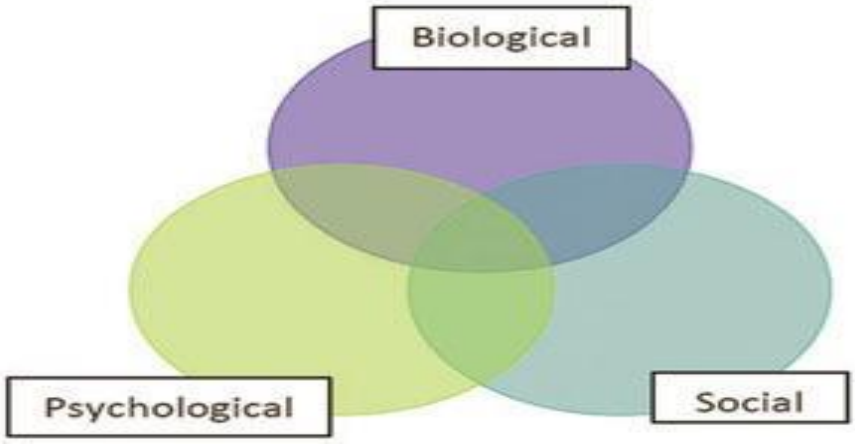

Figure 1.3: The bio-psychosocial model of mental illness.

1.7.2. Prevention of Mental Health Problems in daily life

There are four main areas of focus for improving mental health and reducing the risk of mental illness:

- Promoting a happy, healthy childhood
- Reducing the exposure to violence
- Reducing the use of substances such as alcohol, khat and cannabis
- Support in coping with life's problems.
- Prevention of intellectual disability is another important area

Secondary prevention: screening and early treatment

The earlier that a person with mental illness can get treatment, the better their recovery will be. Different types of mental illness can be detected in different ways. In your day-to-day work you can screen people for mental illness. You can also teach the community about detecting mental illness, and encourage them to take the affected person to a health facility.

Tertiary prevention: reducing the negative impact of mental illness

In people who have already developed mental illness, there are simple actions that you can take to help them recover more fully and more quickly, and to reduce some of the negative effects of mental illness.

Here are a few things you can do to help:

- Encourage the family to care for the person with mental illness by giving them shelter, clothing and food, and helping them to care for their personal hygiene.
- Remember that people with mental illness are at higher risk of many physical illnesses. Don't ignore them if they complain of physical symptoms.
- Monitor their weight to detect under nutrition.
- Monitor carefully for other unwanted effects of medication.
- Explain about the negative effects of drinking alcohol, chewing khat and smoking cigarettes

Self check questions 1.7.1

1. List common causes for sleeping problem in the community?
2. People with too much worry might do many things to get relief without the recommendation of health worker. List common practices he/she might do.

1.8 Cataract

Cataracts are changes in clarity (clouding) of the lens in the eye, which interferes with the passage of light into the eye. As the lens gets increasingly cloudy (opaque), less and less light can get through it.

It is the most common cause of blindness. Visual loss occurs because opacification of the lens blocks light from passing and being focused on the retina at the back of the eye. Although most cases of cataract are related to the ageing process, occasionally children can be born with the condition, or a cataract may develop after eye injuries, inflammation, and some other eye diseases. Persons with cataract experiences reduction of vision and complain of glare. The early symptoms of cataract are blurred vision, difficulty seeing in bright light and poor color vision.

Cataract remains the leading cause of blindness in both developed and developing countries. According to the latest assessment, cataract is responsible for nearly 51% of world blindness, which represents about 20 million people. Cataract alone contributes to 48% of all people who are totally blind.

Figure 1.4. A cataract clouding the lens.

1.8.1. Classification and causes of cataract

Cataracts may be classified based on several factors, such as:

- The age of the person when the cataract was first detected
- The cause of the cataract and whether it is an inborn (genetic) or acquired problem

1.8.2. Risk Factors of cataract

- Physical injury to the eye
- Long-term exposure to very bright sunlight, fumes and smoke from household cooking fires
- Cigarette smoking
- Poor control of diabetes mellitus (the high sugar levels in the blood damages the eye)

Cataracts can also be transmitted in the genes from parent to child.

1.8.3. Prevention of cataract

The purpose of classifying cataracts is to help you understand the different causes, so that you can educate your community about those causes which are preventable. Though there is no really effective way of preventing cataracts at present, interventions such as these can significantly alter the disease burden of cataracts by minimizing exposure to factors that promote them to develop. A healthy lifestyle might also help, just as it helps prevent other non-communicable diseases: eat a balanced diet, get regular exercise and rest, and do not smoke or drink much alcohol.

Self check question 1.8

1. List risk factors for occurrence of cataract?

Unit Summary

In this unit you have learned that common non communicable disease such as cardio vascular diseases, Cancer, diabetes, mental health and cataract.

Cancers are characterized by the rapid creation of abnormal cells which grow beyond their usual boundaries, and which can invade adjoining parts of the body and spread to other organs.

Age, genetic factors, cigarette smoking, chewing *khat*, drinking excessive alcohol, high fat diets, obesity, exposure to chemicals or viruses, and lack of exercise are some of the risk factors for cancer. Cervical cancer and breast cancer are the most common cancers in Ethiopia, based on hospital reports.

There is no clear cause of breast cancer, but it can usually be treated if it is detected early enough. Teaching women about breast self-examination can save many lives through early detection and treatment. Cervical cancer is mainly caused by infection with the human papilloma virus. The heart and blood vessels (arteries, arterioles, capillaries, venules and veins) form the cardiovascular system.

Through cardiovascular system blood transports oxygen, nutrients and other substances such as hormones around the body to where they are needed, and it removes waste products, including carbon dioxide. Cardiovascular diseases include heart attack, stroke, heart failure, and hypertension (high blood pressure). Cardiovascular diseases are a major cause of death and morbidity all over the world.

The risk factors for cardiovascular diseases include being overweight, old age, poor nutrition, smoking, lack of exercise and excessive alcohol intake.

Diabetes is a condition in which the level of glucose in the blood is poorly regulated; it is often too high, but may also fall too low.

Diabetes is classified as Type 1 (insulin-dependent), Type 2 (non-insulin-dependent) and gestational (pregnancy-induced) diabetes.

Chronic obstructive pulmonary disease is an increasingly common progressive respiratory disease; it mainly affects people after the age of about 40 years.

Smoking tobacco is the main risk factor for chronic obstructive pulmonary disease, as well as inhaling second-hand smoke, air pollution, chemical fumes and dust from the environment or workplace, and indoor smoke from cooking fires.

Bronchial asthma is a common lung condition, in which narrowing of the airways can happen suddenly in response to inhaling an allergen, such as house dust mite, pollen or animal hairs; inducing factors that can make an attack worse are industrial pollution, respiratory infections, cigarette smoking and emotional stress. It is the commonest chronic condition in children worldwide.

Mental health is states of well-being in which an individual can realize his/her own abilities, interact positively with others, cope with the stressors of life and study, work productively and fruitfully, and contribute to his/her family and community

Most cases of cataract are related to the ageing process, occasionally children can be born with the condition.

Unit Review Questions

You can assess yourself how well you have achieved the stated learning outcomes in this unit by answering the questions below. Write your answers in you note book and discuss with your peers and check your answers by reading the notes

1. What are the two common types of cancer in Ethiopia?
2. What are the risk factors of cancer?
3. Case scenario:

In the health post you are assigned as community health worker a woman comes to you with compliant including an offensive discharge and bleeding from the vagina, and pain during sexual intercourse. This woman has multiple sexual partners, because of the death of her husband five years ago. You are the only responsible person to give advice for a woman with such and other complaints in this locality.

3.1 Which type of cancer do you suspect for a woman with the above symptom?

3.1 What are the risk factors expected to the occurrence of the health problems for a woman with the above complaints?

4. Case scenario?

Mr.G emchu is a 45 year old man who is working in flower producing company in Batu town. This company has a dust particle raised from the pollens of flowers. He has been worked in this company for the last 20 years. Now a day he has faced the health problem with the symptoms, such as wheezing, coughing, chest tightness and shortness of breath.

4.1 What type of respiratory diseases is suspected in a Mr. Gemechu's case?

4.1 What are the possible risk factors suspected for Mr. Gemechu's health problem?

5. What are the two common types of diabetic? Mention the possible risk factors for each type.
6. What are the common symptoms for anxiety and depression?
7. Which of the following is not the risk factor of hypertension?

A. High level of cholesterol
B. Being obese
C. Physically inactive
D. Younger age

8. True false question

8.1. Ageing is the only factor which can increase the occurrence of cataract.

8.2. Minimizing exposure to factors that promote the occurrence of cataract is one of the prevention mechanisms.

UNIT 2

Under Take Screening

2.1. Introduction

Screening refers to any method of examining an apparently healthy person to see if they have the early signs of a particular disease, which would benefit from having early treatment. Most of non-communicable diseases have no symptom at early stage of development. Early detection of common non-communicable diseases leads to better health outcomes. The ideal screening method should be simple, easy to do, cost-effective, and helps in early detection of the disease. It should be safe, non-invasive, reliable and acceptable to the population.

Learning Outcomes :

After the accomplishing this unit the students will be able to:

- Conduct screening of non-communicable diseases at individual level
- Describe health education points for non-communicable diseases

Key terms: screening, early detection, non-invasive

2.2 Conducting screening of non-communicable diseases

Screening tests are health checks that are done in persons who seem healthy, to try to find unnoticed problems before you have any signs or symptoms of disease. These tests are done as a preventive measure, to detect a potential health problem early before severe disease and complications occur. Health checks also help to reduce the risk of developing chronic conditions by identifying risk factors that make you more likely to develop major non communicable diseases, the main ones being high blood pressure, cardiovascular disease (such as heart attack or stroke), diabetes, cancers and depression. Early detection means getting the right treatment at the right time, which gives you better control over your health.

Persons at high risk of developing non communicable diseases s have certain factors or characteristics that make them more likely to develop non communicable diseases s than the average person.

2.2.1. Early detection of common type of cancer

A. Early detection of breast cancer:

Women in your kebele who are at the age group 30-65 are expected to check their breast regularly. Screening for breast cancer is easily carried out by women themselves. You should advise women in your community to examine their breasts once every week, using the method of **breast self-examination** illustrated in Figure: 2.1 below.

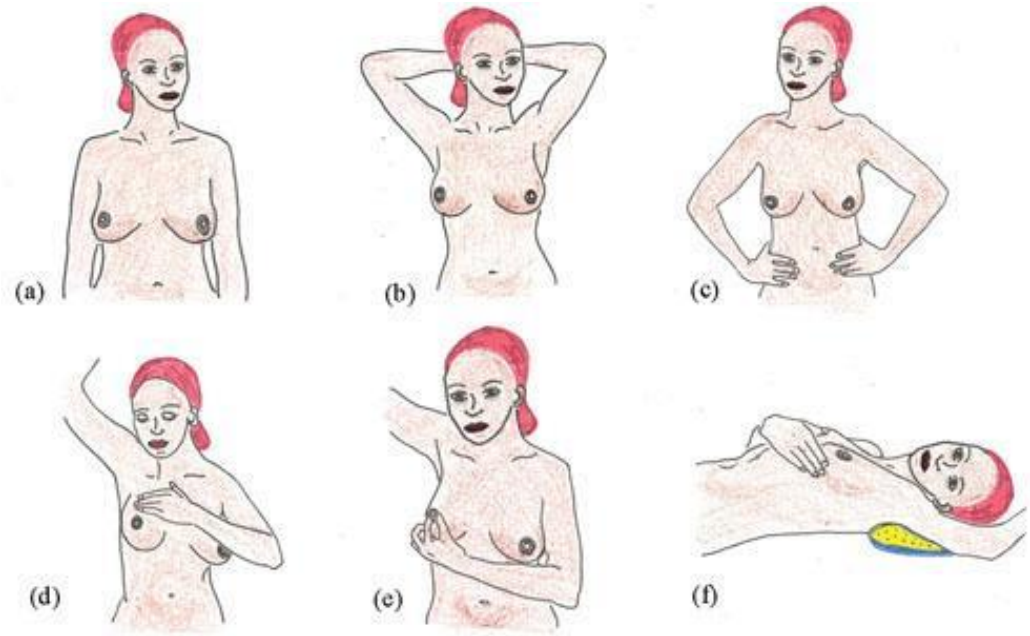

Figure 2.1.The steps of breast self-examination

Steps in breast self-examination:

- View the breasts with arms down at your sides. One breast is normally a little larger than the other, but do they appear about the same size and shape? Is the outline of each breast rounded and smooth, or are there any creases or dimples?
- Look at your breasts for the same signs as in (a), but this time with your arms raised and your hands holding each other behind your head.
- Repeat the visual inspection with your hands on your hips.
- Raise your right hand above your head; with all four fingertips of your left hand, gently press the whole of your right breast, moving your fingers to the next area and using small circular movements. Feel for any lumps or thickened tissue. Repeat with the left breast and right hand.
- Hold your right nipple between the thumb and first finger of your left hand; gently roll the nipple, feeling for any lumps or tenderness. Repeat with the left breast.

- Lie down and stretch your left arm upwards and behind your head. Use small circular pressures with the finger tips of your right hand to examine the whole breast. Repeat with the right breast and left hand

B. Early detection of cervical cancer:

Early detection of cervical cancer can be done with a test called a **Pap smear test**, in which cells are gently scraped from the cervix with a blunt instrument, smeared onto a glass slide and looked at under a microscope. A special stain is applied to the cells (called the Pap stain after the doctor who invented it), which shows up the cancer cells if they are present (Figure 2.2).

Self check questions 2.2.1

1. How frequent should the women in your community to examine their breasts?
2. Let as divide the class in to five group and conduct the breast examination procedure in front of your group members. Take feedback from your peers and trainer about your performance.

2.2.2. Early detection of Hypertension

Screening for high blood pressure is done by checking blood pressure of people at clinical setting or community based setting. As primary health care worker in your locality you are supposed routinely to check the blood pressure of your community, using the blood pressure apparatus supplied to you. Whenever the systolic pressure is greater than 140 mmHg and the diastolic pressure is greater than 90 mmHg, it is advisable to refer the person to the nearest health centre for further evaluation.

Screening for hypertension is done for adults' age of 18 years and above every year.

See table: 2.1 b**lood pressure levels for adults:**

Table: 2.1 Blood pressure levels for adults

Category	Systolic (mmHg)	Diastolic (mmHg)	Advice needed
Normal	120	80	None
Pre hypertension (before hypertension starts)	120-139	80-89	You should advise people with hypertension to make changes in what they eat and drink, to be physically active, and lose extra weight. If your client also has diabetes, refer him or her.
Hypertension	140 or higher	90 or higher	Refer him or her to a higher health facility.

2.2.3. Early detection of Heart failure

A person with heart failure is usually short of breath even when sitting still; they breathe faster than normal and may 'gasp' for breath if they do anything that requires strength or movement. They often cannot sleep without using many pillows because, if they lie down, the blood that cannot be pumped away from the heart collects in the vessels in the chest, which makes them even more breathless. They also complain of tiredness and weakness. If people in your community with the above symptoms come to you or if you hear such compliant while you educating the community they should be screened and referred to nearby health institutes.

Self check questions 2.2.2

1. What points should be incorporated in your advice for a person with pre-hypertension level of blood pressure?
2. Let as divide the class in to five group and measure blood pressure of your peers. Use the available apparatus given by your trainer. Report the value of blood pressure you have measured

2.2.4. Early detection of diabetes

Knowing the level of blood sugar is important to prevent the occurrence of diabetic. WHO recommends that people should check the status every 3 months when newly diagnosed and once he/she becomes stable every 6 month is adequate. When conducting screening for diabetes at community level check the risk factors especially for type two diabetic.

- Ask a family history of diabetes, whether there were someone who have diabetes in that family.
- Check the status of weight of a people who are involved in screening process. Use body mass index of a person by using the formula= Weight /Height square. If the body mass index is: below 18.5, a person becomes underweight range. If it ranges between 18.5 and 24.9- a person becomes healthy weight and if it ranges between 25 and 29.9- a person becomes overweight range.
- Ask whether a person has adequate daily physical exercise.
- If you identify one or more of the above risk factors, refer a person to nearby health center or hospital for laboratory blood test for blood glucose status.

Self check questions 2.2.4

1. When you conduct screening program for diabetes in your kebele a person named Mr, Aregawi comes to you, who weighs 80 kilo gram and has 1.6 meters height.
   A. What is his body mass index?
   B. What is your explanation about the risk of diabetes?

2.2.5. Early detection for bronchial asthma

People with the risk factors which expose him/her to bronchial asthma needs education to prevent it and a person who have typical symptom of bronchial asthma should be screened and referred to next health institutes for medical support and counseling.

2.2.6. Early detection for Mental Health Problems

Mental health problems exposes individuals who need assistance with mental health issues based on common signs.Undiagnosed sadness or anxiety,

Anxiety disorders characterized by excessive worry and trouble sleeping (insomnia), are the cause of the physical problem. An assessment for mental health issues ought to be conducted on anyone exhibiting these signs.

2.2.7. Early detection for cataract

Cataract remains the leading cause of blindness in both developed and developing countries. Early detection of people with complaints of visual changes, such as blurred vision, difficulty in seeing in

bright light, inability to see distant objects or scenes, poor color vision, and difficulty in reading is the duty you are supposed to detect in the community and referred health institution.

2.3. Health Communication

Health education is the only tool to ensure behavior change. To prevent non-communicable diseases the major prevention activity is behavior change, which is the result of health education. As health educator you should give appropriate health education.

2.3.1. Health communication for breast cancer:

To prevent the occurrence of breast cancer you are supposed to give health education on risk factors to prevent breast cancer. The major area of your education should incorporate the following points:

- Don't smoke
- Maintain a healthy weight
- Exercise regularly
- Eat a healthy diet
- Drink alcohol in moderation, if at all
- Protect yourself from the sun
- Protect yourself from infections
- Get screening tests regularly

Your health education should also include how a woman to check the unusual lump or any palpable mass in the breast, or sees a change in the appearance of the breast, refer her to the nearest health centre if there is such un usual lump and create awareness to adhere the treatment if diagnosed by the health worker.

2.3.2. Health communication for cervical cancer:

Your health education should focus on risk factors which expose women to cervical cancer. Incorporate the following points:

- To seek a Pap smear tests once every two or three years because cervical cancer screening detects the cancer early.
- Attend treatment for sexually transmitting diseases

- Avoid smoking
- Avoid having multiple sexual partners
- Avoid unprotected sex or poor sexual hygiene
- Create awareness to stop early marriage at community level
- Use balance diet to enhance the immunity
- Encourage adherence to drug for those HIV/AIDs positive

2.3.3. Health communication for hypertension:

As community health care worker creating awareness is primary duty you are supposed to do. To avoid or minimize the risk of hypertension, your health education should be targeted on points mentioned in prevention approaches for hypertension.

2.3.4. Health communication for diabetes:

Creating awareness on predisposing factors for diabetes is important for prevention of diabetes at individual and community level. The health education topics should include the following points:

- Reduce-fat and salt consumption
- Avoid excess alcohol
- Do regular physical exercise
- Importance of medical check up
- Maintain weight

2.3.5. Health communication Chronic Obstructive Pulmonary Disease and Bronchial Asthma

As we have learnt in unit one chronic obstructive pulmonary disease and bronchial asthma are the common respiratory diseases worldwide. These problems are more serious especially in developing countries like Ethiopia because of life style and living condition. As the community health worker you are supposed to create awareness on how to prevent chronic obstructive pulmonary disease and bronchial asthma.

Your health education topics should focus on the following topics:

- Avoid tobacco smoking
- Avoid smoking in the area where there are non-smokers
- Create healthful housing(which has adequate ventilation, space, separated kitchen etc.) to prevent indoor air pollution
- Use personal protective equipments to minimize the risk if a person is exposed to pollutions at work place such as industries.
- Strengthen early detection of chronic obstructive pulmonary disease and bronchial asthma based on the symptoms mentioned d in unit one.
- Create allergy-proof environment to prevent bronchial asthma
- Strengthen vaccination for flu which can be aggravate the exposure
- Perform physical exercise regularly to manage body weight

2.3.6. Health communication for mental health problems

As we have learnt in unit one mental illness is the leading non-communicable disorder in terms of burden and disability associated with mental illness in Ethiopia is high. You are supposed to educate people on prevention of mental illness and to help people with this problem in your locality .Therefore your education should be focused on the points which you have been learnt in unit one.

2.3.7. Health communication for cataract

Though there is no really effective way of preventing cataracts at present, interventions such as these can significantly alter the disease burden of cataracts by minimizing exposure to factors that promote them to develop. You are supposed to help people with this health problem in your locality. Therefore your health education should focus on:

- Take care to avoid physical injury to the eye
- Avoid long-term exposure to very bright sunlight, fumes and smoke from household cooking fires
- Stop cigarette smoking
- Strengthen early detection and control of diabetes mellitus because the high sugar levels in the blood damages the eye

Self check question 2.3

1. Make a team which has five members and go to nearby health center/ hospital/health post and deliver appropriate health education based on the health education plan of the health institutes designed by your trainer and health workers.

Unit Summary

In this unit you have learned that screening refers to any method of examining an apparently healthy person to see if they have the early signs of a particular disease.

Early detection of cervical cancer can be done with a test called a **Pap smear test.**

Screening for high blood pressure is done by checking blood pressure of people at clinical setting or community based setting.

Whenever the systolic pressure is greater than 140 mmHg and the diastolic pressure is greater than 90 mmHg, it is advisable to refer the person to the nearest health centre for further evaluation.

A person with heart failure is usually short of breath even when sitting still; they breathe faster than normal and may 'gasp' for breath if they do anything that requires strength or movement.

WHO recommends that people should check the status every 3 months when newly diagnosed and once he/she becomes stable every 6 month is adequate.

Though there is no really effective way of preventing cataracts at present, interventions such as these can significantly alter the disease burden of cataracts by minimizing exposure to factors that promote them to develop.

Unit Review Questions

1. After your health education in the kebele you are assigned to serve the community a woman comes to you with complaints palpable mass in the breast, sees a change in the appearance of the breast and bloody flood discharge from the nipple.

A. What health problem does this case indicate?

B. What is your advice for this woman?

2. How frequent does a woman who are sexually active should visit the health institute for checking the status of cervical cancer?

3. Case scenario?

Mrs. Kelemua is a 55 year old woman who is living in Keja kebele in kaffa zone. You are a primary health care worker assigned in that kebele. She comes to you with complaints such as headaches, blurring of vision, chest pain, nose bleeds and restlessness. When you check her blood pressure, it becomes 160/120mmHg.

A. What is your explanation about Mrs. Kelemua's blood pressure level?

B. What are your advices for Mrs. Kelemua's?

4. Mr. kassa is a 50 year old man who lives in your kebele. Whose weight is 65 kilo gram and has 1.80 meters height. As you know weight is one of the risk factors of diabetes. Based on the above information:

A. Does Mr. Kassas's weight become the risk for diabetes? Yes ⬭ No ⬭

B. If your response is no, Why? Explain it.

5. List the health education topics for prevention of chronic obstructive pulmonary disease bronchial asthma?

UNIT 3

Follow Up of Cases with Common Non-Communicable Diseases

3.1. Introduction

Follow-up is the act of making contact with patients or their care givers at a later, on specified date to check on patient's progress since the last appointment. As the primary health care worker you are supposed to prevent the occurrence of non-communicable diseases. You are also supposed to follow up cases with different non-communicable diseases and refer for further care and medical intervention

Learning Outcomes :

After the accomplishing this unit the students will be able to:

- Conduct counseling and supporting
- Understand referral and follow up

Key terms: follow up cases, refer

3.2. Counseling and Supporting

Counseling is professional assistance in coping with personal problems, including emotional, behavioral, vocational, marital, and educational and rehabilitation of people with a problem.

3.2.1. Counseling for cancer

A. Counseling for breast cancer

Giving appropriate counseling and support for women who has symptom of breast cancer illustrated above in figure 2.4 is important to protect further complication and to get medical treatment. Include the following points during your counseling process.

- Importance of periodic self checking of the breast for cancer
- Avoid aggravating factors of the occurrence of breast cancer
- Inform women who have with typical symptoms of breast cancer to adhere for recommended medical treatment.

B. Counseling for cervical cancer

As primary health worker you are supposed to give appropriate counseling for women who are already identified as positive for cervical cancer. The focus area should be:

- Encourage adherence to drug for those HIV/AIDs positive
- Attend treatment for other sexually transmitting diseases
- Adhere treatment for cervical cancer
- Avoid smoking
- Avoid having multiple sexual partners
- Avoid unprotected sex or poor sexual hygiene

3.2.2. Counseling and support for Cardio Vascular diseases (CVD)

A. Hypertension:

Give advice for people with hypertension to minimize the risk and further complication. The focus area of your advice should include:

- To minimize the stress in their lives
- Maintain a healthy weight.
- Be moderately physically active on most days of the week.
- Follow a healthy eating plan, which includes foods lower in salt.
- Do not drink alcoholic; if sodo so in moderation.
- If you have high blood pressure and are prescribed medication, take it as directed.

B. Heart failure

A heart attack and stroke which are the root cause for heart failure can occur without any advance warning. Give the following advice to you clients:

- Seek medical help from a nurse or doctor urgently if you have any of the above Cardio Vascular diseases signs or symptoms.
- Attend periodical medical check to know your health status.
- Avoid the non communicable disease risk factors

3.2.3. Counseling for diabetes:

How can you support the people with diagnosed diabetes in your community?

Giving counseling for diabetic cases is important for secondary prevention. Everyone with diabetes, regardless of treatment, should get the following information through your counseling:

- Attend regular medical checkups
- Be aware of possible wound infection if they hurt themselves and seek urgent treatment if this occurs
- Always wear shoes that fit correctly; wounds, blisters or sores on the feet can lead to tissue damage that is difficult to heal
- Have an eye test once every year to check for early signs of eye damage
- Always include exercise as a routine part of their lifestyle
- Attend health education sessions prepared for people with diabetes to learn about self-care.

Table 3.1 Recommended diets in diabetes.

Foods	Can be eaten in moderate amounts	Limited to small occasional
Carbohy Drates	Complex (starchy) carbohydrates should be the main part of any meal, e.g. injera, bread, other cereals, rice, potatoes,etc.Starchy Carbohydrates are broken downslowly into sugars, so the glucose levels in theblood rise slowly.	Foods containing sugar are not encouraged, particularly if the person needs to lose weight, because sweet foods are energy-rich and, fattening‟. Sugary foods and drinks can put up blood glucose levels very quickly and have very little or no nutritional value.
Fats	Fats, such as those in olive oil and avocados are good for maintaining a healthy weight. Grilling,baking and steaming cooking methods produce less fattening foods than frying.	Fats should be limited to help control body weight, especially „hard‟ fats such as butter and animal lard.
Proteins	Protein is found in meat, fish, eggs, nuts, pulses and dairy products, and is recommended in a healthy diet.	Avoid „fatty‟ sources of protein such as fatty meat, or a lot of egg yolks.
Vitamin, mineral and fiber	Fruits and vegetables are an excellent source of dietary fiber, vitamins and minerals; try to eat five portions of fruit and vegetables each day, e.g. <<gommen>> or kale, cabbage,	Fruit contains sugar and tends to increase blood glucose levels. People are often surprised at this because fruit is a healthy eating option.

	carrots, spinach, tomatoes,mangoes.	
Salt	A small amount of salt daily is all that is needed; this can mostly be obtained from fresh natural foods.	Most people eat more salt than is required by the body; food should be tasted before salt is added, if necessary, at the table. Limiting salt intake can help decrease blood pressure.

3.2.4 Counseling for people with chronic obstructive pulmonary disease

- Give advice a person with chronic obstructive pulmonary disease to avoid risk factors
- Encourage them to attend medical checkup in regular manner

3.2.5. Counseling for people with bronchial Asthma

- Advice people to keep them self from aggravating factors
- Give advice people who are having an asthma attack to be taken urgently to a hospital or health centre if the symptoms do not quickly improve
- Encourage the use of inhaler

3.2.6. Counseling and support for mental illness

Help a person if they are suffering from an anxiety disorder (worrying too much):

- Show the person that you take their problem seriously
- Screen for depression and refer for treatment if needed
- If they are using alcohol and/or *khat* then advice those to stop
- Suggest cutting back on coffee as this can make anxiety worse.
- If they have sudden attacks of severe anxiety, tell them to breathe into a paper bag. This will help to calm them down.
- Encourage person, regular exercise
- For the person who worries about lots of different things at the same time:
- Sit with the person and help them to make a list of all their worries.
- Focus on just one worry – the main one.

- Help the person to think of step-by-step actions to tackle that single problem.
- Involve a family member if appropriate.
- Encourage the person to try to solve the problem and check on their progress

Self check question 3.2

1. For which non-communicable diseases the inhaler recommended?

A. Bronchial asthma
B. Hypertension
C. Breast cancer
D. Diabetes

3.3. Referral and Follow up

When you conduct screening you will identify suspected cases of hypertension, diabetes or cancers. You should refer such individuals to the nearest health center or hospital for confirmatory diagnosis by the medical officer or trained specialists. Laboratory confirmation for early diagnosis and management of such cases will be undertaken at the appropriate health facilities. People referred to further investigation needs confidentiality from you. Therefore do not disseminate personal information unnecessary to others; this will destroy people's faith in you and in the public health system.

3.3.1Referral and follow up for breast cancer:

A woman who has some of the following warns signs of breast cancer should be referred to nearby health center or hospital for further counseling and treatment.

- Lump in the breast or underarm area (armpit).
- Thickening or swelling of part of the breast.
- Irritation or puckering/dimpling of breast skin.
- Redness or flaky skin in the nipple area or the breast.
- Pulling in of the nipple or change in position or shape and pain in the nipple area.
- Nipple discharge other than breast milk, including blood.
- Any change in the size or the shape of the breast.
- Constant pain in any area of the breast or armpit.

Once a woman has with diagnosed breast cancer your follow up is important to adhere her to treatment (radiotherapy or chemotherapy).

3.3.2. Referral and follow up for cervical cancer:

A woman with sexually transmitted infection vaginal bleeding between periods, menstrual periods that are longer or heavier than usual, post-menopausal bleeding, bleeding after sexual intercourse,

pain during sexual intercourse .unusual vaginal discharge tinged with blood, lower abdominal pain, unexplained weight loss and pain during urination should be referred to the nearby health centre or hospital for treatment and screening of cervical cancer.

A person with advanced cancer (or any other chronic life-threatening condition) needs **palliative care**. The aim of palliative care is to improve the quality of life of the sick individual and their family in the period before the death, and to help the family cope with the bereavement after the death. It involves prevention and relief of suffering, pain and other physical problems, and attention to psychosocial and spiritual issues. It focuses on supporting the patient to enjoy what remains of their life as fully as possible, and helps them and their family to manage symptoms such as pain and nausea. It also helps the relatives to cope with the overwhelming feelings they may be experiencing about losing their loved one.

3.3.3. Referral and follow up for Hypertension

If the blood pressure of a person beyond the normal range (>140/90 mmHg) if un-controlled refer to the nearby health centre or hospital. Regular follow up of those people who are with hypertension.

3.3.4. Referral and follow up for Diabetes Mellitus

If a person is with diabetes whose random blood sugar is over 140 mg/dl has uncertain diagnosis, symptoms are aggravated even though he is on anti-diabetic medications and if he/she develops complications like foot ulcers, vision problem & numbness of the extremities refer to the nearby health centre or hospital for further support. Every patient will have a treatment plan that consists not only of medication but also advice on lifestyle changes. You should visits to the patients for ensuring compliance to treatment, checking on diet and life style modification, and measuring the blood glucose level if materials are available.

3.3.5. Referral and follow up for chronic obstructive pulmonary disease and bronchial asthma

If a person manifests the following symptom of chronic cough, shortness of breath, chronic mucus production, wheezing and chronic chest pain this person suspects for chronic obstructive pulmonary disease. Therefore refer to nearby health centre or hospital for medical treatment and further investigation. In the same manner advise people with asthma attack to be taken urgently to a hospital or health centre if the symptoms do not quickly improve.

3.3.6. Referral and follow up patients with common mental illnesses

Refer urgently if a patient:

- Has been chained or tied up by the family.
  - Is aggressive, violent towards others or harming themselves.
  - seems confused
  - Complains many of the depressive symptoms.
  - Has suicidal thoughts or plans, or may even have attempted to harm themselves
  - Is believe, seeing or hearing things that are not true or real.
  - Has developed a severe withdrawal reaction when alcohol is not available – feeling sick, trembling, headache, confusion, seeing things that aren't really there. .
  - Hasa co-morbidity of alcohol use and serious medical condition like diabetes, liver disease or a heart condition.
  - Has a co-morbidity of substance use and serious mental illness, like psychosis or depression or suicidal behaviour
  - Is drinking alcohol during a pregnancy or breastfeeding?

Self check question 3.3

1. As community health worker during your home visit what can you advice a person with known diabetes who follow treatment?

Unit Summary

In this unit you have learned that counseling is professional assistance in coping with personal problems, including emotional, behavioral, vocational, marital, and educational and rehabilitation of people with a problem.

If the blood pressure of a person beyond the normal range (>140/90 mmHg) if un-controlled refer to the nearby health centre or hospital.

A person with advanced cancer (or any other chronic life-threatening condition) needs **palliative care**. The aim of palliative care is to improve the quality of life of the sick individual and their family in the period before the death, and to help the family cope with the bereavement after the death.

A person manifests the following symptom of chronic cough, shortness of breath, chronic mucus production, wheezing and chronic chest pain this person suspects for chronic obstructive pulmonary disease.

A woman with sexually transmitted infection should be referred to the nearby health centre or hospital for treatment and screening of cervical cancer.

A person is with diabetes whose random blood sugar is over 140 mg/dl has uncertain diagnosis, symptoms are aggravated even though he is on anti-diabetic medications and if he/she develops complications.

Unit Review Questions

1. List symptoms of cervical cancer which are the base to referring women to next health institutes.
2. Why palliative care is important for advanced chronic ill person?
3. List symptoms of breast cancer which are the base to referring women to next health institutes.
4. Case scenario question?

Mrs. Shashote is a 42 year old woman who is living in the kebele you assigned to serve the community as primary health care worker. During your home visiting program she tells you the complaints mentioned below. His complaints were: vaginal bleeding between periods, bleeding after sexual intercourse, pain during sexual intercourse .unusual vaginal discharge tinged with blood, lower and pain during urination.

A. What type of non-communicable disease do you suspect for this client?
B. What can you do for the women?

Project Work

Based on the information given below conduct community based screening for hypertension and submitted your report to your instructor.

Assume that in your kebele mender 01 has 40 households. The expected total population is 240. The district health office urges you to conduct hypertension screening for adults above 30 years old in this mender. The number of people with this age category expected 80. Take 50% of this group and conduct screening for hypertension.

- Use sphygmomanometer for measuring the blood pressure
- Use check lists mentioned below to collect personal information before measuring blood pressure
- Prepare your report which contains detail information.

Check lists

1. What is your age? (incomplete years) 30-39 years__40-49 years___ > 50 years____
2. Do you smoke? Never____Some times_____ Daily_____
3. Do you consume alcohol daily? Yes_____ No_____
4. Do you undertake any physical activities? At least 150 minutes in a week___ Less than 150 minutes in a week____
5. Do you have a family history of your parents of high blood pressure? Yes___ No____

Answer Keys for Self Check Questions

Unit 1 Self-check answers

Self check 1.2

1. Non-communicable diseases are the focus area in public health of developing countries. Because now days the risk factors such as tobacco use, harmful use of alcohol, insufficient physical activity, and unhealthy diet are practiced in majority of community in low income countries significantly.

Self check 1.3.1

1. A person should avoid intake high level of fat, do physical exercise, avoid excessive alcohol intake which are the common risk factors for occurrence of hypertension.

2. A person with hypertension might have the following symptoms: headaches, blurring of vision, chest pain, nose bleeds and restlessness.

Self check 1.4.2

1. Malignant tumor has a capacity to grow rapidly and to spread to other tissues
2. Human papilloma virus the cause for occurrence of cervical cancer

Self check 1.5

1. Insulin and glucagon are the two most important hormones involved in the control of blood glucose levels.

2. Gestational diabetes in pregnancy can cause adverse outcomes such as: congenital malformations, increased birth weight and elevated risk of prenatal mortality.
3. Common viruses associated with type 1 diabetes are retroviruses such as Coxsackie virus B (CVB), Rota virus, Mumps virus and cytomegalo virus).

Self check 1.6

1. The main risk factor for chronic obstructive pulmonary disease is smoking tobacco, air pollution by smoke chemical fumes and dusts and age related factors.

Self check 1.7.1

1. Common causes of sleeping problems are: bad sleeping habits, undetected mental illness, social problems such as somebody has died, not enough food for the family, stimulants such as coffee, alcohol, *khat*, a physical health problem(diabetes, breathing problems, epilepsy), late pregnancy and environment conditions(uncomfortable sleeping place, cold, noisy) etc
2. People with too much worry can do unrecompensed practices to get relief from his/her worry. This includes using alcohol and *khat.*

Self check 1.8

1. Risk factors for cataracts; Physical injury to the eye, Long-term exposure to very bright sunlight, cigarette smoking, poor control of diabetes mellitus

Unit 2 Self-check answers

Self check 2.2.1

1. A woman who is apparently health should be conduct self check of her breast once every week.
2. Demonstrate breast examination by simulating.

Self check 2.2.2

1. People within pre-hypertension level of hypertension should be advised to make changes in what they eat and drink, to be physically active, and lose extra weight. If your client also has diabetes, refer him or her.
2. Measure blood pressure of your peers with available instrument.

Self check 2.2.4

1. A. Body mass index = Weight / height square =80 kilogram/1.6meter square =**31.25**

B. The BMI of Mr. Areaway's is out of the normal range. He becomes at the risk of different none communicable diseases (diabetes, hypertension). Therefore you should advice him to take steps on his life style urgently.

Self check 2.3

1. Provide health education for based on the topic arranged by your instructor incorporation points you have deal above for each common non communicable disease.

Unit 3 Self-check answers

Self check 3.2

1. Bronchial asthma

Self check 3.3

1. As community health worker your role for diabetes case is critical. You should visits to the patients for ensuring compliance to treatment, checking on diet and life style modification, and measuring the blood glucose level if materials are available.

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MODULE VII

Hygiene and Environmental Health Service

Contents

Module Description

This module is designed to help grade 11 school students develop the skills and knowledge and attitude necessary to promote hygiene and prevent the spread of diseases. Through a combination of lectures, readings, discussions, and hands-on activities, students will learn about the importance of personal hygiene, environmental hygiene, and sanitation practices. It will also assist to attain the following **learning outcomes**:

- Promote personal hygiene
- Promote food hygiene and water supply
- Promote Environmental Hygiene

Key terms : hygiene, sanitation

UNIT 1

Promoting Personal Hygiene

1.1. Introduction

Personal hygiene is a concept that is commonly used in medical and public health practices. It is also widely practiced at the individual level and at home. It involves maintaining the cleanliness of our body and clothes. Personal hygiene is personal, as its name implies. In this regard, personal hygiene is defined as a condition promoting sanitary practices to the self. Everybody has their own habits and standards that they have been taught or that they have learned from others. Generally, the practice of personal hygiene is employed to prevent or minimize the incidence and spread of communicable diseases.

Personal hygiene involves practices that promote cleanliness and overall health. It includes cleaning the body, washing hands, and other preventive measures.

Good personal hygiene contributes to a healthy body, preventing illnesses and promoting general well-being.

Hygiene generally refers to the set of practices associated with the preservation of health and healthy living. The focus is mainly on personal hygiene that looks at cleanliness of the hair, body, hands, fingers, feet and clothing, and menstrual hygiene. Improvements in personal knowledge, skill and practice that modify an individual's behavior towards healthy practice are the focus of hygiene promotion. Safe hygiene practice includes a broad range of healthy behaviors, such as hand washing before eating and after cleaning a child's bottom, and safe faces disposal. When you carry out hygiene education and promotion the aim is to transfer knowledge and understanding of hygiene and associated health risks in order to help people change their behavior to use better hygiene practices.

Unit learning out comes

- Identify types of personal hygiene
- Promote personal hygiene practices
- Identify hand wash practices

Key terms: Routine, Hand Hygiene, Nail and Hair Care, Nose and Ear Cleaning, Preventive Measures

1.2. Basic Concepts of Hygiene Practice

Personal hygiene is a concept that is commonly used in medical and public health practices. It is also widely practiced at the individual level and at home. It involves maintaining the cleanliness of our body and clothes. Personal hygiene is personal, as its name implies. In this regard, personal hygiene is defined as a condition promoting sanitary practices to the self. Everybody has their own habits and standards that they have been taught or that they have learned from others. Generally, the practice of personal hygiene is employed to prevent or minimize the incidence and spread of communicable diseases. The knowledge and practice of personal hygiene are vital in all our everyday activities.

The purposes of personal hygiene are:

Preventing faeco-orally transmitted diseases: The fingers may get contaminated with one's own faeces, either directly or indirectly. Activities during defecation and child bottom-washing are additional opportunities for the contamination of the fingers that facilitate the transmission of infections.

Aesthetic values of personal hygiene: A person with clean hands is proud while eating because they feel confident of preventing diseases. A teacher in a school is always happy to see their students with clean faces and eyes, and dressed in clean clothes. A mother is mentally satisfied to feed her infant with clean hands because she ensures the preservation of her child's health. Generally, cleaning oneself produces pride, comfort and dignity at home and in public places. Caring about the way you look is important to your self-esteem.

Social impact: A person with poor personal hygiene might be isolated from friendship because telling the person about the situation might be sensitive and culturally difficult. The success of a job application or the chance of promotion could be affected by poor personal hygiene; no company wants to be represented by someone who does not appear to be able to look after themselves.

Good personal hygiene will help us to keep feeling good about ourselves. Since those who do not take care of their personal hygiene i.e., dirty clothes, body odor and bad breath will suffer from discrimination and this will mainly lead to mental problems. But the most important point is that all people have their own hygiene but some people do it better than others, this will mainly

depend on each person culture, society and family norm. Personal hygiene entails more than just being clean. It includes the many practices that help people stay healthy. Hygiene promotes comfort, safety, and better health. Many factors affect hygiene needs- perspiration (sweating), elimination, vomiting, drainage from wounds or body openings, bed rest, and activity. Illness and aging changes can affect self-care abilities. Some people need help with hygiene.

Self-check questions 1.2.

1. _____ is a condition promoting sanitary practices to the self
2. _____ generally, refers to the set of practices associated with the preservation of health and healthy living

1.3 Hand washing practices

The cleanliness of our hands is very important in all our daily activities. In our normal activities our hands frequently get dirty. There are many situations in which microorganisms are likely to attach to our hands along with the dirt. There are many communicable diseases that follow the route of faeco-oral transmission. Hand hygiene plays a critically important role in preventing this transmission.

1.3.1. Hand washing practice by using water and soap

Hygienic hand washing involves the mechanical removal of microorganisms from contaminated hand surfaces using soap or detergent. Hand washing should involve more than a quick rinse under a tap (faucet) or in running water. The following hand washing technique (also shown in Figure 1.1) ensures that the hands are properly washed and it doesn't take long to complete:

- First wet your hands with clean water and later with a bar of soap.
- Next rub your hands together vigorously and scrub all surfaces up to your wrists.
- Clean under your fingernails.
- Continue for 15–30 seconds or about the length of a little tune
- It is the soap combined with the scrubbing action that helps dislodge and remove germs.
- Rinse your hands well with clean running water (pour from a jug or tap)
- Dry your hands in the air to avoid recontamination on a dirty towel – do not touch anything until your hands are dry.

1.3.2. Alcohol-Based Hand Sanitizer

You can use an alcohol-based hand sanitizer that contains at least 60% alcohol if soap and water are not available. Washing hands with soap and water is the best way to get rid of germs in most situations. If soap and water are not readily available, you can use an alcohol-based hand sanitizer that contains at least 60% alcohol. You can tell if the sanitizer contains at least 60% alcohol by looking at the product label. Sanitizers can quickly reduce the number of germs on hands in many situations. However, sanitizers do not get rid of all types of germs. Hand sanitizers may not be as effective when hands are visibly dirty or greasy.

Hand sanitizers might not remove harmful chemicals from hands like pesticides and heavy metals.

Caution! Swallowing alcohol-based hand sanitizers can cause alcohol poisoning if more than a couple of mouthfuls are swallowed. Keep it out of reach of young children and supervise their use.

How to Use Hand Sanitizer:

1. Apply the gel product to the palm of one hand (read the label to learn the correct amount).
2. Rub your hands together.
3. Rub the gel over all the surfaces of your hands and fingers until your hands are dry. This should take around 20 seconds.

Figure: 1.2 How to Use Hand Sanitizer

Self-check questions 1.3.

1. _____ involves the mechanical removal of microorganisms from contaminated hand surfaces using soap or detergent.

1.4 Critical situation to wash hands

As well as routine personal hygiene that applies to everyone, your daily work will include many situations when you may ask yourself when you need to wash your hands. To know when to wash your hands at home and at work, you must first identify **critical situations**; that is, situations, activities or incidents that indicate the possibility that pathogenic microorganisms are present on hands, fingers and nail surfaces.

Critical situations in everyday activity include:

- After using the toilet (or disposing of human or animal faeces)
- After changing a baby's diaper (nappy) and disposing of the faeces
- Immediately after touching raw food when preparing meals (e.g. chicken or other meat)
- Before preparing and handling cooked/ready-to-eat food
- Before eating food or feeding children
- After contact with contaminated surfaces (e.g. rubbish bins, cleaning cloths, food-contaminated surfaces)
- After handling pets and domestic animals
- After wiping or blowing the nose or sneezing into the hands (respiratory hygiene)
- After handling soiled tissues (you're own or others', e.g. children).

Critical situations in healthcare activity for hand washing:

- Before and after contact with an infected wound
- After contact with blood or body fluids (e.g. vomit)
- Before and after dressing wounds
- Before giving care to an 'at risk' person (e.g. attending delivery, attending a baby)
- After giving care to an infected person.

Self-check questions 1.4

1. _____ is situations, activities or incidents that indicate the possibility that pathogenic microorganisms are present on hands, fingers and nail surfaces.

1.5. Bathing and showering

Bathing and showering are essential personal hygiene practices that involve cleaning the body. Let us see them separately

1.5.1. Bathing

Bathing is the act of cleaning oneself by immersing the body in water or using water to wash. It is a fundamental personal hygiene practice that helps remove dirt, sweat, and bacteria from the skin. Bathing can take various forms, such as taking a shower, bath, or using other water-based methods to cleanse the body.

Different cultures and individuals may have unique bathing traditions and preferences. Some people prefer showers for their efficiency, while others enjoy the relaxation of a warm bath. The choice of bathing products, such as soap, shampoo, and other toiletries, can also vary based on personal preferences and skin types.

In addition to personal hygiene, bathing can have therapeutic benefits. Warm baths, for example, are often used to relax muscles, relieve stress, and promote a sense of well-being. However, it's essential to strike a balance, as excessive bathing or the use of harsh products can lead to skin dryness and other skin issues.

Overall, bathing is an essential aspect of maintaining personal cleanliness and health, contributing to both physical and mental well-being.

Concepts related to bathing:

- **Types of Baths**: Baths can be taken in a bath tub, hot tub, or even a natural body of water like a lake or river.
- **Benefits**: Bathing can help relax muscles, improve blood circulation, and provide a soothing experience. Some people also use bath salts, oils, or bubbles for added relaxation.
- **Considerations**: It's important to be mindful of water temperature to avoid scalding, especially for children and the elderly. People with certain medical conditions should consult with their healthcare provider regarding bath safety.

1.5.2. Showering:

Showering is the process of using water to clean the body. It typically involves standing under a spray of water and using soap, shampoo, and other cleansing products to remove dirt, sweat, and oils from the skin and hair. Showers are a common part of personal hygiene and are usually taken on a daily or regular basis.

There are various types of showers, including traditional fixed showers, handheld showers, and combination showerheads that offer different spray patterns. Some people prefer hot showers for relaxation, while others may opt for cold showers for various health benefits. The duration and frequency of showers can vary based on individual preferences and cultural practices.

In addition to personal hygiene, showers can serve other purposes, such as providing a refreshing start to the day, promoting relaxation, and serving as a time for personal reflection. It's important to note that excessive use of hot water and certain shower products may have potential effects on the skin and the environment.

Benefits of showering:

Quick and Efficient: Showers are generally quicker than baths and are a more water-efficient way to cleanse the body.

Daily Routine: Many people incorporate daily showers into their routine for convenience and freshness.

Hygiene: Showers are effective for removing dirt, sweat, and excess oils from the skin. They can also be invigorating, especially with the option of using different water pressures.

Figure: 1 .3 A. Showering B. bathing

- **Water Temperature**: Use a comfortable water temperature to avoid skin irritation or discomfort.
- **Moisturizing**: After bathing or showering, it's often recommended to moisturize the skin to prevent dryness.
- **Personal Preferences**: Whether you prefer a bath or a shower is often a matter of personal preference. Some people enjoy the relaxation of a bath, while others appreciate the efficiency of a shower.

In summary, both bathing and showering are effective methods for personal hygiene, and individuals may choose one or the other based on their preferences, time constraints, or specific health considerations.

Self-check questions 1.5.

1. _____ is a fundamental personal hygiene practice that helps remove dirt, sweat, and bacteria from the skin.
2. Excessive bathing or the use of harsh products can lead to _____

1.6. Oral hygiene

Oral hygiene is crucial for maintaining good dental health. Here's some information on brushing and flossing:

Brushing

- Brush your teeth at least twice a day, preferably in the morning and before bedtime.
- Use a soft-bristled toothbrush and fluoride toothpaste.
- Brush in a circular motion, covering all surfaces of your teeth – front, back, and chewing surfaces.
- Be gentle to avoid damaging your gums and enamel.
- Replace your toothbrush every three to four months or sooner if the bristles are frayed.

Flossing

- Floss daily to remove plaque and food particles from between your teeth where your toothbrush might not reach.

- Use about 18 inches of dental floss and wind most of it around one of your middle fingers.
- Hold the floss tightly between your thumbs and forefingers and gently guide it between your teeth using a back-and-forth motion.
- Curve the floss into a C-shape against one tooth and slide it into the space between the gum and the tooth.
- Repeat this process for all your teeth, making sure to use a clean section of floss for each.

Additional tips:

Consider using an antiseptic mouthwash to help reduce plaque and fight bacteria. Visit your dentist regularly for check-ups and professional cleanings. Remember, proper oral hygiene helps prevent cavities, gum disease, and other dental issues, contributing to overall health and well-being. If you have specific concerns or conditions, it's advisable to consult with a dentist for personalized advice.

Self-check questions 1.5.

1. _____ is crucial for maintaining good dental health. Here's some information on brushing and flossing.
2. _____ remove plaque and food particles from between your teeth where your toothbrush might not reach.

1.7 Nail care

A nail is hard tissue that constantly grows. Long fingernails tend to accumulate or trap dirt on the underside. The dirt could be as a result of defecation or touching infected and contaminated surfaces. Keeping nails trimmed and in good shape weekly is important in maintaining good health. Clip nails short along their shape but do not cut them so close that it damages the skin. Razor blades and fingernail cutters or scissors are used to cut nails. Nail cutters should not be shared with others.

Why is it inadvisable to share nail cutters?

Sharing nails cutters is not advisable, because some diseases, such as fungal infections, can be transmitted easily from person to person in this way.

Figure: 1.4. Nail Cutting

Appropriate hand hygiene includes diligently cleaning and trimming fingernails, which may harbor dirt and germs and can contribute to the spread of some infections, such as pinworms. Fingernails should be kept short, and the undersides should be cleaned frequently with soap and water. Because of their length, longer fingernails can harbor more dirt and bacteria than short nails, thus potentially contributing to the spread of infection.

Before clipping or grooming nails, all equipment (for example, nail clippers and files) should be properly cleaned. Sterilizing equipment before use is especially important when nail tools are shared among a number of people, as is common in commercial nail salons. Infections of the fingernails or toenails are often characterized by swelling of the surrounding skin, pain in the surrounding area, or thickening of the nail. In some cases, these infections may be serious and need to be treated by a physician.

To prevent the spread of germs and nail infections:

- Keep nails short and trim them often.
- Scrub the underside of nails with soap and water (or a nail brush) every time you wash your hands.
- Clean any nail grooming tools before use.
- In commercial settings such as nail salons, sterilize nail grooming tools before use.
- Avoid biting or chewing nails.
- Avoid cutting cuticles, as they act as barriers to prevent infection.
- Never rip or bite a hangnail. Instead, clip it with a clean, sanitized nail trimmer.

Self-check 1.7.

1. Appropriate hand hygiene includes diligently _____ and _____ of fingernails.

2. Infections of the fingernails or toenails are often characterized by _____of the surrounding skin.

1.8 Hair care

The hair follicles from which the hair grows produce oil from the sebaceous glands that keeps the hair smooth. The scalp (the skin covering the head) also has numerous sweat glands and is a surface for the accumulation of dead skin cells. The oil, sweat and dead cells all add together and can make the hair greasy and look dirty unless you wash it regularly.

Poor hair hygiene could cause dandruff and skin infections such as *Tineacapitis*(see Figure3.1). Dandruff is dead skin on the scalp that comes off in tiny flakes when sebaceous glands produce too much oil and accumulates on the scalp. Head hair is a good harbor for head lice (*Pediculus human's capitis)* and nits (eggs of head lice). The head louse is a tiny insect that lives by sucking blood. Children are especially prone to lice infestation. Lice spread from one head to another when there is close contact as in school environments. They make the scalp itchy and are a cause of annoyance, irritation and embarrassment. Shaving of the head hair is possible in cases of heavy lice infestation. Sharing blades with others, however, should be discouraged. Hair cleaning (Figure 3.6) is important to ensure it stays clean, healthy and strong.

The recommended procedures for cleaning the hair are:

1. Use clean water to wash your hair regularly (at least twice weekly, preferably once every other day) with body soap or shampoo, whichever is available.
2. Massage your scalp well. This will remove dead skin cells, excess oil and dirt.
3. Rinse well with clear water.
4. Conditioner is helpful if you have longer hair as it makes the hair smoother and easier to comb, but hair doesn't need to have conditioner.
5. Use a wide toothed comb for wet hair as it is easier to pull through.
6. Dry the hair and the head with a clean towel. Never share a towel with someone else.
7. Comb the hair to look beautiful for the day.
8. Maintaining a healthy scalp and hair through good hygiene and proper hair care can help prevent and control many diseases and conditions.

9. Use soap and clean, running water to remove dirt, oil, and unwanted residue from your head

Figure:1.5.Hair hygiene practice

Washing your scalp helps control scalp conditions and infections ringworm on the scalp spreads through direct contact with an infected animal or person, or from the environment. Good hygiene practices, like not sharing combs, towels, or other personal items and washing your hands regularly, can help protect you.

Head lice spread most commonly by direct head-to-head (hair-to-hair) contact. However, much less frequently, they can spread through shared clothing or other belongings. This can happen if lice crawl onto those items or eggs attached to shed hairs fall on the items. Good hygiene practices are important for preventing and controlling the spread of head lice. For example, don't share combs, brushes, or towels. Machine wash clothes and linens used by people with head lice.

Self-check questions 1.8.

1. Poor hair hygiene could cause _____ and _____.
2. _____on the scalp spreads through direct contact with an infected animal or person, or from the environment.

1.9 Clothing hygiene and personal grooming

We usually have two layers of clothing. The internal layer is underwear (or underclothes) such as pants, vest and T-shirt. These are right next to our skin and collect sweat and dead skin cells, which can stain the cloth. Bacteria love to grow on this dirt and produce a bad smell in addition

to the specific odor of the sweat. Underwear must be washed more frequently than the outer layer of clothing.

Clothes hygiene is an important aspect of one's dignity. Changing used clothes for clean ones every day is recommended. Washing dirty clothes requires adequate clean water, detergents (solid or powdered soap) and washing facilities (Figure 7). If possible, the washed clothes should be ironed to help the destruction of body lice and nits. Boiling water or insecticides can be used to destroy clothes infestation.

Figure: 1.6. A. Washing clothes in a river B. Washing at a communal washbasin.

As this figure shows, frequent changing into clean clothes might not always be possible in poor households. However, the frequency of changing is advised to be twice a week for internal wear and 12 times per week for outerwear. The frequency mainly depends on the intensity of dirt on the clothes, and that depends on the climate and type of activity.

Self-check questions 1.8.

1. We usually have ------ layers of clothing.
2. The frequency of changing is advised to be ____ a week for internal wear and ____ per week for outerwear.

Unit Summary

Personal hygiene is a necessity for our daily activities. It is very important for the protection of our health and helps to prevent the spread of communicable diseases.

Personal hygiene has social and aesthetic values. An individual who follows the practice of proper personal hygiene gains confidence, pride and dignity.

Personal hygiene applies to all parts of the body, but hand hygiene is probably the most important for community health.

The procedures that apply in personal hygiene (such as hand washing and oral hygiene) need to be followed strictly to gain the best results.

The promotion of personal hygiene should aim to change human behaviors.

The provision of hygiene information first impacts on knowledge and then practice.

The promotion of personal hygiene must be well planned in order to bring positive changes.

Unit Review Questions

Instruction: Give brief answer for the following review questions:

1. Discusses hygiene with its importance in community health
2. Describe components and meaning of personal hygiene
3. List types of hand hygiene
4. Describe oral hygiene
5. List the ways of promoting personal hygiene

UNIT 2

Food Hygiene and Water Supply

2.1. Introduction

Food and water hygiene plays a pivotal role in safeguarding public health and preventing the transmission of diseases. In both developed and developing nations, ensuring the safety of the food we consume and the water we drink is paramount. Poor hygiene practices can lead to the contamination of food and water with harmful pathogens, resulting in widespread illness and outbreaks of diseases.

Promoting food and water hygiene involves raising awareness about the importance of adopting and maintaining proper hygiene practices at various stages of the food and water supply chain. This includes production, processing, distribution, storage, and consumption. Education and outreach initiatives are essential components of effective promotion, as they empower individuals and communities to make informed choices that contribute to the overall safety of the food and water they consume.

Key aspects of promoting food and water hygiene include advocating for proper food handling, storage, and preparation techniques, as well as encouraging the adoption of safe water management practices. Awareness campaigns can focus on the significance of hand washing, proper sanitation, and the use of clean and safe water sources. Additionally, regulatory measures and guidelines are often implemented to ensure compliance with hygiene standards in food production and water supply systems.

By emphasizing the importance of food and water hygiene, communities can reduce the risks of food borne illnesses and waterborne diseases, ultimately contributing to improved public health outcomes. This introduction sets the stage for exploring the various strategies and initiatives that are instrumental in promoting food and water hygiene on a global scale.

Unit out comes

- Identify key points of food hygiene
- Identify principles of food hygiene
- Promote Safe Food Handling

Key terms: outbreaks of diseases, proper sanitation, waterborne diseases

2.2. Promoting Food Hygiene

Promoting food hygiene involves implementing practices and educating individuals to ensure the safety and cleanliness of food throughout the entire food production and consumption process.

Here are some key points and tips for promoting food hygiene:

- **Hand washing:** Emphasize the importance of regular hand washing with soap and water, especially before handling food. Proper hand hygiene helps prevent the spread of harmful bacteria.
- **Safe Food Handling:** Educate individuals on the proper handling, storage, and preparation of food to avoid contamination. This includes separating raw and cooked foods, using separate cutting boards for raw meat and produce, and storing food at appropriate temperatures.
- **Clean Cooking and Eating Utensils:** Encourage the regular cleaning and sanitization of cooking and eating utensils, as well as kitchen surfaces. This helps prevent the transfer of bacteria from surfaces to food.
- **Safe Water and Ingredients:** Ensure the use of safe water sources and fresh, uncontaminated ingredients in food preparation. Contaminated water and ingredients can introduce harmful microorganisms to the food.
- **Personal Hygiene of Food Handlers:** Stress the importance of good personal hygiene among those involved in food preparation, including chefs, cooks, and food handlers. This includes wearing clean clothing, using hairnets, and avoiding working when sick.
- **Food Storage:** Teach proper techniques for storing food, both in the refrigerator and at room temperature. This includes using airtight containers, labeling items with expiration dates, and avoiding overcrowding the refrigerator to maintain proper airflow.
- **Education and Training:** Provide education and training programs on food hygiene for individuals working in the food industry and consumers alike. Awareness campaigns can help reinforce good practices.

- **Government Regulations:** Adhere to and promote adherence to local and national food safety regulations. These regulations often provide guidelines and standards for maintaining food hygiene in various settings.
- **Regular Inspections:** Conduct regular inspections of food establishments to ensure compliance with hygiene standards. This can be done by health authorities or regulatory bodies.
- **Public Awareness Campaigns:** Utilize public awareness campaigns through various media channels to inform the general public about the importance of food hygiene. This can include posters, brochures, online resources, and community events.

  By promoting these practices, individuals and communities can contribute to maintaining high standards of food hygiene, preventing foodborne illnesses, and ensuring the overall well-being of the population.

Self-check 2.2.

1. _____ involves implementing practices and educating individuals to ensure the safety and cleanliness of food throughout the entire food production and consumption process.
2. _____ includes proper handling, storage, and preparation of food to avoid contamination.
3. _____ and _____can introduce harmful microorganisms to the food.
4. _____ includes wearing clean clothing, using hairnets, and avoiding working when sick.

2.3. Basic Principles of Food Hygiene

Principles of food hygiene are guidelines and practices aimed at ensuring the safety and cleanliness of food throughout the entire food chain from production and processing to preparation and consumption. Adhering to these principles helps prevent food borne illnesses and ensures the quality of food products.

Some basic principles of food hygiene:

Personal Hygiene:

- Ensure that food handlers wash their hands thoroughly with soap and water before handling food.
  - Maintain clean and appropriate clothing, including hairnets and aprons.

Cleanliness of Premises:

- Regularly clean and sanitize all food preparation areas, utensils, and equipment.
- Keep the kitchen and storage areas free from pests.

Temperature Control:

- Store food at the correct temperatures to prevent the growth of harmful bacteria. This includes refrigeration for perishable items and appropriate cooking temperatures for different foods.

Cross-contamination Prevention:

- Separate raw and cooked foods to prevent cross-contamination. Use separate cutting boards and utensils for raw meats and ready-to-eat foods.

Safe Storage Practices:

- Store food properly, following guidelines for refrigeration, freezing, and dry storage.
- Regularly check and monitor the expiration dates of perishable items.

Waste Management:

- Dispose of waste properly to prevent the attraction of pests and the spread of bacteria.

Training and Education:

- Ensure that all staff involved in handling food are adequately trained in food hygiene practices.
- Stay updated on the latest food safety regulations and guidelines.

HACCP (Hazard Analysis and Critical Control Points):

- Implement a systematic approach to identify, assess, and control hazards at critical points in the food production process.

Allergen Awareness:

- Be aware of common food allergens and take measures to prevent cross-contamination for individuals with food allergies.

Traceability:

- Maintain records and systems that allow for the traceability of food products to their source, helping in case of recalls or contamination issues.

  These principles help prevent food borne illnesses, ensure the quality of food products, and comply with food safety regulations.

Self-check question 2.3.

1. _____are guidelines and practices aimed at ensuring the safety and cleanliness of food throughout the entire food chain from production and processing to preparation and consumption.
2. _____is following guidelines for refrigeration, freezing, and dry storage .
3. _____ is a systematic approach to identify, assess, and control hazards at critical points in the food production process

Dear student! Have you answered the self-check questions? If yes, let us move Safe food handling.

2.4. Safe Food Handling

Safe food handling refers to the practices and guidelines implemented to ensure that food is prepared, stored, and served in a way that minimizes the risk of food borne illnesses. Adhering to proper food handling procedures is crucial for preventing contamination and maintaining food safety. As precautionary: Avoid contact between raw foods and cooked foods, Wash hands repeatedly, keep all kitchen surfaces meticulously clean, protect foods from insects, rodents, and other animal and use safe water.

Some key tips for safe food handling:

- **Cleanliness:** Wash hands thoroughly with soap and water before handling food. Ensure that all utensils, cutting boards, and surfaces are clean and sanitized.

- **Separation:** Keep raw meats, poultry, seafood, and eggs separate from ready-to-eat foods to avoid cross-contamination. Use different cutting boards and utensils for raw and cooked foods.

- **Cooking temperatures:** Cook food to the recommended internal temperatures to kill harmful bacteria. Use a food thermometer to ensure accuracy.

- **Chilling:** Refrigerate perishable foods promptly to slow down the growth of bacteria. Keep the refrigerator temperature at or below 40°F (4°C).

- **Thawing:** Thaw frozen food safely in the refrigerator, microwave, or cold water. Avoid thawing at room temperature to prevent bacterial growth.

- **Storage:** Store food properly to prevent spoilage. Follow storage guidelines for specific types of food, and pay attention to expiration dates.

- **Personal hygiene:** Encourage good personal hygiene among food handlers, including proper hand washing, wearing clean attire, and avoiding work when sick.

- **Avoiding cross-contamination:** Use separate cutting boards and utensils for raw and cooked foods. Clean and sanitize surfaces, utensils, and hands after handling raw meat, poultry, or seafood.

By following these guidelines, individuals can contribute to the prevention of foodborne illnesses and help ensure the safety of the food supply.

Self-check 2.4.

1. Keeping raw meats, poultry, seafood, and eggs separate from ready-to-eat foods to avoid cross-contamination in safe food handling is?
2. Keep the refrigerator temperature at or below 40°F (4°C) is?

2.5 Promoting Water Supply

Water is at the center of economic and social development; it is vital to maintain health, grow food, manage the environment, and create jobs. Despite water's importance, globally, 2 billion people lack access to safely managed drinking water and 3.6 billion people lack access to safely managed sanitation.

Water supply is the provision of water by public utilities, commercial organizations, community endeavors or by individuals, usually via a system of pumps and pipes. Public water supply

systems are crucial to properly functioning societies. These systems are what supply drinking water to populations around the globe. Aspects of service quality include continuity of supply, water quality and water pressure. The institutional responsibility for water supply is arranged differently in different countries and regions (urban versus rural). It usually includes issues surrounding policy and regulation, service provision and standardization.

2.5.1 Water Supply and Diseases

Several terms are used to describe the types of disease associated with water. These are:

Waterborne diseases are those caused by ingestion of water that is contaminated by human or animal excrement and contains pathogenic microorganisms. Transmission occurs by drinking contaminated water.

Water-washed diseases are caused by poor personal hygiene, and skin and eye contact with contaminated water. They are also sometimes known as water-scarce diseases because they occur when there is not enough water available for adequate personal washing. They include scabies, trachoma, typhus, and other flea, lice and tick-borne diseases.

Water-based diseases are caused by parasites that spend part of their lifecycle in water. For example, schistosomiasis and dracunculiasis are both water-based diseases caused by helminthes (parasitic worms). Schistosomiasis (also known as bilharzias) is caused by a worm that spends part of its lifecycle in the body of a particular species of water snail. People can become infected from swimming or wading in infected water. Dracunculiasis or guinea worm is transmitted by drinking water that is contaminated with copepods (very small crustaceans) that contain the larvae of the worm.

Water-related diseases are caused by insect vectors, especially mosquitoes, that breed or feed near water. They are not typically associated with lack of access to clean drinking water or sanitation services. Water-related diseases include dengue fever, filariasis, malaria, onchocerciasis, trypanosomiasis and yellow fever.

Note that, rather confusingly, the term ‘water-related’ is sometimes used to mean all the above, i.e. all diseases associated with water.

Chemical contamination of water is another potential cause of health problems. In some places, water may contain naturally occurring toxic chemicals such as arsenic and fluoride. Other

chemicals may get into the water supply because of pollution. Lead poisoning, for example, can result from water contaminated with lead. These diseases are also classified as waterborne diseases.

Waterborne diseases include most of the enteric and diarrheal diseases caused by bacteria and viruses. Water plays a crucial role in both spreading and preventing diseases. Contaminated water sources can be a breeding ground for various pathogens, leading to waterborne diseases. Common waterborne diseases include:

- **Cholera:** Caused by the bacterium Vibrio cholera, cholera is often spread through contaminated water and food.
- **Dysentery:** This inflammatory disorder of the intestine can be caused by various bacteria, parasites, or viruses commonly found in contaminated water.
- **Giardiasis:** A parasitic infection caused by the protozoan Giardia lamblia, which can be transmitted through contaminated water.
- **Hepatitis A:** A viral infection affecting the liver, commonly transmitted through the consumption of contaminated water or food.
- **Typhoid Fever:** Caused by the bacterium Salmonella Typhi, typhoid fever is often contracted through contaminated water or food.

Preventing waterborne diseases involves ensuring access to clean and safe drinking water, proper sanitation practices, and hygiene.

2.5.2 Approaches and Considerations In Promoting Water Supply

Promoting water supply involves various strategies and initiatives aimed at ensuring access to clean and sufficient water for communities.

Some key approaches and considerations:

1. **Infrastructure Development**
    - Invest in the construction and maintenance of water supply infrastructure, including wells, boreholes, pipelines, and water treatment plants.
    - Implement sustainable and resilient water supply systems to withstand climate variability.

Community Engagement:

- Raise awareness about the importance of clean water and hygiene practices within communities.
- Involve local communities in the planning and decision-making processes to ensure the sustainability of water supply projects.

Government Policies and Regulations:

- Develop and enforce policies that prioritize water supply and sanitation.
- Implement regulations to prevent pollution and protect water sources.

Technology and Innovation:

- Explore innovative technologies for water treatment and distribution.
- Implement water-saving technologies to promote efficient water use.

Education and Training:

- Provide training programs on water management, conservation, and sanitation.
- Incorporate water-related topics into school curricula to instill a sense of responsibility from an early age.

Public-Private Partnerships (PPPs):

- Collaborate with private organizations to fund, implement, and manage water supply projects.
- Encourage investments in the water sector through partnerships with businesses and NGOs.

Monitoring and Evaluation:

- Establish monitoring systems to track water quality, usage, and infrastructure functionality.
- Regularly evaluate the impact of water supply projects to identify areas for improvement.

Emergency Preparedness:

- Develop contingency plans for water supply during emergencies, such as droughts or natural disasters.

- Ensure quick response mechanisms to address water-related crises.

International Cooperation:

- Seek support from international organizations, NGOs, and donor agencies for funding and technical expertise.
- Collaborate with neighboring regions to address cross-border water supply challenges.

Financial Sustainability:

- Implement transparent and efficient billing systems to ensure the financial sustainability of water supply services.
- Explore innovative financing models to secure funds for ongoing maintenance and improvements.

Promoting water supply involves a multifaceted approach that addresses infrastructure, community involvement, policy, technology, education, and collaboration. Implementing a combination of these strategies can contribute to sustainable and equitable access to water resources.

Self-check 2.5.

1. _____ is the provision of water by public utilities, commercial organizations, community endeavors or by individuals, usually via a system of pumps and pipes.
2. Diseases those caused by ingestion of water that is contaminated by human or animal excrement and contains pathogenic microorganisms are called.
3. _____ include dengue fever, filariasis, malaria, onchocerciasis, trypanosomiasis and yellow fever.
4. _____ involves ensuring access to clean and safe drinking water, proper sanitation practices, and hygiene.
5. _____ involves a multifaceted approach that addresses infrastructure, community involvement, policy, technology, education, and collaboration.

2.6 Provision of Safe Drinking Water

Safe water is water which is free from disease-causing agents and does not have any significant risk to health over a lifetime of consumption. The term potable water is also sometimes used; 'potable' means safe to drink. A related but different term is palatable water, which means water that is pleasant to drink. Palatable water is at a desirable temperature, completely transparent and free from tastes, odors and colors, but is not necessarily free from disease-causing agents. Safe drinking water is suitable for all usual domestic purposes, including personal hygiene. Access to safe and affordable water is considered to be a basic human right.

The provision of safe drinking water involves ensuring that water is free from contaminants and meets certain quality standards to safeguard public health. Various measures and practices are implemented to achieve this goal. Here are some key points related to the provision of safe drinking water.

Water Source Identification and protection

Drinking water sources can vary depending on geographical location and infrastructure. Here are some common drinking water sources. Drinking water source protection refers to the measures and strategies implemented to safeguard the quality and availability of water sources used for drinking. It involves protecting both surface water (such as lakes and rivers) and groundwater from contamination or depletion.

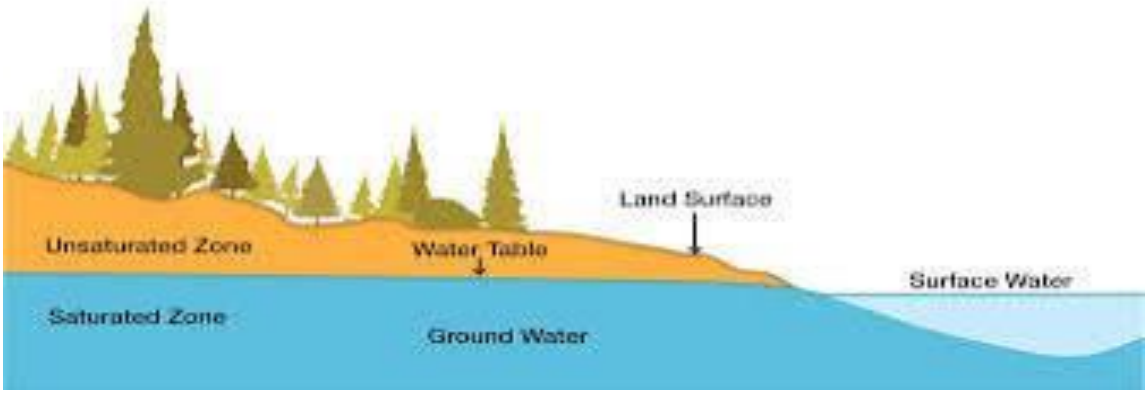

Figure: 2.1 types of water sources

- **Tap Water:** Most urban areas receive treated tap water from municipal water treatment plants. This water undergoes purification processes to meet safety standards.

- **Well Water:** In rural or remote areas, people often rely on well water. It comes from underground aquifers and requires testing for contaminants.
- **Spring Water:** Natural springs provide water that emerges from the ground. Spring water is often considered pure, but it should be tested to ensure safety.
- **Surface Water:** Lakes, rivers, and reservoirs are sources of surface water. This water is treated before distribution for drinking to remove impurities.
- **Rainwater Harvesting:** Some people collect rainwater for consumption. It requires proper filtration and storage to ensure it's safe to drink.
- **Bottled Water:** Bottled water is sourced from various places, including springs, wells, or municipal supplies. It's essential to check the source and quality of bottled water.

Self-check 2.6.

1. ____ is water which is free from disease-causing agents and does not have any significant risk to health over a lifetime of consumption.

2. _____ means water that is pleasant to drink.

3. _____ involves ensuring that water is free from contaminants and meets certain quality standards to safeguard public health.

2.7 Treatment of Drinking Water

Water treatment is any process that improves the quality of water to make it appropriate for a specific end-use. The end use may be drinking, industrial water supply, irrigation, river flow maintenance, water recreation or many other uses, including being safely returned to the environment. Water treatment removes contaminants and undesirable components, or reduces their concentration so that the water becomes fit for its desired end-use. This treatment is crucial to human health and allows humans to benefit from both drinking and irrigation use.

Water contamination is primarily caused by the discharge of untreated wastewater from enterprises. The effluent from various enterprises, which contains varying levels of contaminants, is dumped into rivers or other water resources.

The wastewater may have a high proportion of organic and inorganic contaminants at the initial discharge. Industries generate waste water as a result of fabrication processes, processes dealing with paper and pulp, textiles, chemicals, and from various streams such as cooling towers, boilers, and production lines.

Treatment for drinking water production involves the removal of contaminants and/or inactivation of any potentially harmful microbes from raw water to produce water that is pure enough for human consumption without any short term or long term risk of any adverse health effect. In general terms, the greatest microbial risks are associated with ingestion of water that is contaminated with human or animal (including bird) faeces. Faeces can be a source of pathogenic bacteria, viruses, protozoa and helminths.

The removal or destruction of microbial pathogens is essential, and commonly involves the use of reactive chemical agents such as suspended solids, to remove bacteria, algae, viruses, fungi, and minerals including iron and manganese.Research including Professor Linda Lawton's group at Robert Gordon University, Aberdeen is working to improve detection of cyanobacteria.These substances continue to cause great harm to several less developed countries who do not have access to effective water purification systems.

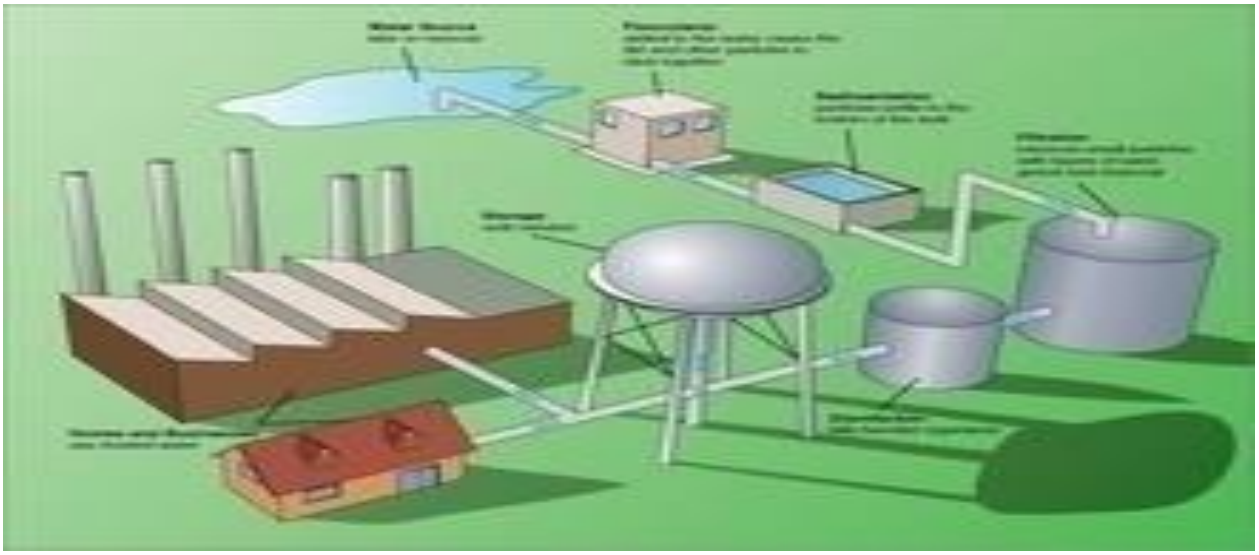

Figure: 2.2.Typical drinking water treatment processes

Measures taken to ensure water quality not only relate to the treatment of the water, but to its conveyance and distribution after treatment. It is therefore common practice to keep residual disinfectants in the treated water to kill bacteriological contamination during distribution and to keep the pipes clean.

Water supplied to domestic properties such as for tap water or other uses, may be further treated before use, often using an in-line treatment process. Such treatments can include water softening or ion exchange.

2.7.1. Household Water Treatment

Household water treatment refers to the methods and processes used to make water safe for domestic use by removing or killing harmful microorganisms and contaminants. There are various methods for household water treatment, each with its own advantages and limitations. Some common household water treatment methods include:

- **Boiling:** Boiling water is one of the simplest and oldest methods of water treatment. It effectively kills bacteria, viruses, and parasites. However, it may not remove chemical contaminants.

- **Filtration:** Filtration involves passing water through a physical barrier to remove particles and impurities. Different types of filters, such as activated carbon filters and ceramic filters, can be used for this purpose.
- **Chlorination:** Adding chlorine or chlorine-based compounds to water can disinfect it by killing bacteria and other microorganisms. However, it may not be effective against certain parasites and may produce taste and odor issues.
- **Ultraviolet (UV) Treatment:** UV treatment uses ultraviolet light to deactivate the DNA of microorganisms, preventing them from reproducing. It is effective against bacteria, viruses, and parasites but may not remove chemical contaminants.
- **Reverse Osmosis:** This method uses a semi permeable membrane to remove a wide range of contaminants, including bacteria, viruses, and chemicals. It is effective but can be relatively expensive.

- **Water Purification Tablets:** These tablets typically contain chemicals such as chlorine or iodine, which can be added to water to disinfect it. They are portable and convenient for emergency situations.

The choice of water treatment method depends on the specific contaminants present in the water, the available resources, and the desired level of purification. It's important to follow recommended guidelines for each method to ensure safe and effective water treatment.

Advancements in water treatment technologies and monitoring systems contribute to improving the efficiency and reliability of providing safe drinking water. Ensuring access to safe drinking water is a critical aspect of public health, and the collaboration of government agencies, water utilities, and communities is essential to maintaining a reliable and safe water supply.

2.7.2. Water Quality Standards

Water quality standards are guidelines or regulations set by government authorities to ensure the quality and safety of water for various purposes, such as drinking, swimming, fishing, and industrial use. These standards establish specific criteria and limits for various contaminants and parameters in water.

These standards are usually developed by environmental agencies at the national or regional level. The United States Environmental Protection Agency (EPA), for example, establishes water quality criteria and standards under the Clean Water Act. Similarly, other countries have their own regulatory frameworks and standards.

2.7.2.1. Key aspects of water quality standards include

- **Safe Drinking Water Standards:** These standards define the acceptable levels of contaminants in drinking water to ensure public health. They often cover substances such as bacteria, chemicals, and heavy metals.
- **Surface Water Quality Standards:** These standards are applied to rivers, lakes, and other surface water bodies. They aim to protect aquatic ecosystems, wildlife, and recreational activities by regulating parameters like dissolved oxygen, pH, nutrients, and specific pollutants.
- **Groundwater Quality Standards:** Groundwater standards are designed to protect the quality of underground water sources, which may be used for drinking water or other purposes. They typically address contaminants like nitrate, arsenic, and other pollutants.

- **Wastewater Discharge Standards:** Industries and municipalities are often required to meet specific standards for the discharge of wastewater into water bodies to prevent pollution and protect the environment.
- **Marine Water Quality Standards:** Coastal and marine water bodies have specific standards to protect marine life, ecosystems, and human activities such as swimming and fishing.

It's important for water quality standards to be regularly reviewed and updated to reflect advancements in scientific understanding and changes in environmental conditions. Monitoring and enforcement are crucial to ensure compliance and maintain the health of water resources.

Self-check 2.7

1. _____any process that improves the quality of water to make it appropriate for a specific end-use.
2. ____ is primarily caused by the discharge of untreated wastewater from enterprises.
3. _____ involves passing water through a physical barrier to remove particles and impurities.
4. _____ are guidelines or regulations set by government authorities to ensure the quality and safety of water for various purposes, such as drinking, swimming, fishing, and industrial use.

Unit Summary

Food and water hygiene plays a pivotal role in safeguarding public health and preventing the transmission of diseases. In both developed and developing nations, ensuring the safety of the food we consume and the water we drink is paramount. Poor hygiene practices can lead to the contamination of food and water with harmful pathogens, resulting in widespread illness and outbreaks of diseases.

Promoting food hygiene involves implementing practices and educating individuals to ensure the safety and cleanliness of food throughout the entire food production and consumption process.

Principles of food hygiene are guidelines and practices aimed at ensuring the safety and cleanliness of food throughout the entire food chain from production and processing to preparation and consumption. Adhering to these principles helps prevent food borne illnesses and ensures the quality of food products. These principles help prevent food borne illnesses, ensure the quality of food products, and comply with food safety regulations

Water supply is the provision of water by public utilities, commercial organizations, community endeavors or by individuals, usually via a system of pumps and pipes. Public water supply systems are crucial to properly functioning societies. These systems are what supply drinking water to populations around the globe. Aspects of service quality include continuity of supply, water quality and water pressure.

Water plays a crucial role in both spreading and preventing diseases. Contaminated water sources can be a breeding ground for various pathogens, leading to waterborne diseases. The provision of safe drinking water involves ensuring that water is free from contaminants and meets certain quality standards to safeguard public health. Various measures and practices are implemented to achieve this goal. Household water treatment refers to the methods and processes used to make water safe for domestic use by removing or killing harmful microorganisms and contaminants.

Unit Review Questions

Instruction: Give brief answer for the following review questions:

1. Discusses the role of food hygiene and water supply in community health?
2. List some key tips for safe food handling?
3. List Objective of water treatment?
4. Define provision of safe water supply?

UNIT 3

Environmental Hygiene

3.1. Introduction

Promoting environmental hygiene involves adopting practices and behaviors that contribute to the cleanliness and sustainability of the environment. Environmental hygiene is crucial for maintaining a clean and safe environment, particularly in healthcare settings. It involves effective cleaning, disinfecting surfaces, and sterilizing equipment to prevent healthcare-associated infections. This practice extends beyond healthcare, encompassing natural surroundings, air, water, plants, animals, and shelter in the broader context. Understanding the difference between cleaning and disinfecting, identifying hot spots, and recognizing its importance is vital. The principles and concepts of hygiene and environmental health are foundational in ensuring a healthy living and working environment.

Environmental hygiene pertains to the collective measures taken to control and improve the cleanliness of our natural surroundings and the subsequent impact on health and wellness. This discipline encompasses a wide range of activities aiming to prevent disease and promote health by creating a clean environment that reduces exposure to potentially harmful biological agents.

The concept of environmental hygiene is intrinsically linked to public health. It involves the implementation of policies and procedures to safeguard the environment, ensuring that air, water, and soil are kept clean. This helps in preventing the spread of diseases and maintains a healthy ecosystem for all living organisms. One of the primary concerns in environmental hygiene is the management of waste. Proper waste disposal and treatment are critical to prevent contamination of natural resources. Practices such as recycling, composting, and the safe disposal of hazardous substances play a crucial role in maintaining environmental cleanliness.

In healthcare settings, environmental hygiene takes on a heightened significance. The risks of infections and disease spread can be mitigated through rigorous sanitation practices, proper waste disposal, and the constant cleaning of surfaces. The urban environment presents unique challenges for environmental hygiene. High population densities, industrial activities, and increased waste generation make it imperative to adopt innovative solutions for maintaining

cleanliness in cities. The move towards integrated pest management and organic farming techniques can mitigate these impacts.

Community engagement is crucial in environmental hygiene initiatives. Local community practices, such as community clean-ups and the establishment of local gardens, can have a positive impact on the local environment. Climate resilience practices, such as the development of green infrastructure and restoration of natural habitats, are critical for sustaining environmental hygiene in the face of climate change and extreme weather events. Monitoring and regulation are key components of maintaining environmental hygiene. Regular audits and assessments can help identify areas for improvement and ensure compliance with environmental standards.

Unit out comes

- Promote healthy housing
- Identify pests negatively impact human activities
- Identify environmental health laws and regulations

Key terms: harmful biological agents, Climate resilience practices, High population densities

3.2 Healthy full housing

Healthy housing generally refers to living spaces that promote physical and mental well-being. Here are some key factors associated with healthy housing: good ventilation, proper humidity levels, and the absence of pollutants contribute to healthy indoor air quality. Adequate exposure to natural light is important for circadian rhythms and overall well-being.

Homes should be designed with safety in mind, including proper electrical systems, secure windows and doors, and fire safety measures. Moisture control is crucial to prevent mold growth, which can negatively impact respiratory health. Sufficient living space and proper layout contribute to comfort and well-being. Proximity to parks, green spaces, and nature can positively impact mental health. Proper insulation and soundproofing help create a quiet and comfortable living environment. Access to clean and safe drinking water is essential for a healthy home Homes with well-designed layouts and functional spaces enhance daily living and reduce stress.

Regular maintenance and prompt repairs contribute to a safe and healthy living environment. When looking for or creating a healthy home, it's important to consider these factors to ensure a holistic approach to well-being.

Self-check 3.2.

1. _____involves adopting practices and behaviors that contribute to the cleanliness and sustainability of the environment.
2. _____pertains to the collective measures taken to control and improve the cleanliness of our natural surroundings and the subsequent impact on health and wellness.
3. ____generally, refers to living spaces that promote physical and mental well-being.

3.3 Paste Control

Pest control refers to the management or regulation of pests, which are organisms that can negatively impact human activities, agriculture, and the environment. The goal of pest control is to minimize or eliminate the damage caused by pests and to protect human health. There are various methods of pest control, including chemical, biological, and mechanical approaches.

Chemical Pest Control

- Involves the use of pesticides or chemical substances to control pests.
- Common pesticides include insecticides, herbicides, and fungicides.

Biological Pest Control

- Utilizes natural predators, parasites, or pathogens to control pest populations.
- Examples include releasing beneficial insects or using microbial agents to target pests.

Mechanical Pest Control

- Involves the use of physical barriers or traps to prevent or capture pests.
- Examples include insect traps, fencing, and other mechanical devices.

Cultural Pest Control

- Involves modifying agricultural or environmental practices to reduce pest populations.
- Crop rotation, proper waste management, and maintaining plant diversity are examples.

Integrated Pest Management (IPM)

- Combines multiple pest control methods to achieve effective and sustainable results.
- Aims to minimize the use of chemical pesticides and promote environmentally friendly approaches.

It's important to consider the specific context and type of pest when choosing a pest control method. Additionally, sustainable and eco-friendly practices are becoming more emphasized in modern pest management strategies.

Self-check 3.3.

1. _____involves adopting practices and behaviors that contribute to the cleanliness and sustainability of the environment.
2. _____pertains to the collective measures taken to control and improve the cleanliness of our natural surroundings and the subsequent impact on health and wellness.
3. _____ generally, refers to living spaces that promote physical and mental well-being.

3.4 Air Quality

Air quality refers to the condition of the air within our surroundings, particularly in terms of the presence of pollutants. These pollutants can include particulate matter nitrogen dioxide sulfur dioxide ozone carbon monoxide and volatile organic compounds among others. Monitoring air quality is crucial for assessing its impact on human health, the environment, and climate. Key contributors to air pollution include household combustion devices, motor vehicles, industrial facilities, and more.

The World Health Organization (WHO) emphasizes the adverse health effects of air pollution, particularly from exposure to pollutants like nitrogen dioxide and sulfur dioxide. Several organizations and agencies worldwide provide real-time air quality data through monitoring stations and online platforms. Some popular resources for checking air quality include

World Air Quality Index (WAQI): A global platform that aggregates air quality data from various monitoring stations around the world. The index categorizes air quality into different levels, ranging from "Good" to "Hazardous."

Air Visual: A platform that provides real-time air quality data, forecasts, and historical information. It also offers a global air quality map.

Environmental Protection Agency (EPA): the EPA monitors and reports air quality through the Air Quality Index (AQI), which categorizes air quality into different levels and provides health recommendations.

European Environment Agency (EEA): Monitors air quality in European countries and provides information on pollutants, air quality indices, and related policies.

To check the air quality in your specific location, you can use these platforms or consult local environmental agencies that may have their monitoring systems in place.

Self-check 3.4.

1. _____ refers to the condition of the air within our surroundings, particularly in terms of the presence of pollutants
2. _____ monitors and reports air quality through the Air Quality Index
3. _____is a platform that provides real-time air quality data, forecasts, and historical information .

3.5 Noisy pollution

What is noise pollution?

Not all sound is considered noise pollution. The World Health Organization defines noise above 65 decibels (dB) as noise pollution. To be precise, noise becomes harmful when it exceeds 75 decibels (dB) and is painful above 120 dB. Noise pollution refers to the presence of excessive, disruptive, or harmful noise in the environment. It is typically caused by various sources, including traffic, industrial activities, construction, and social events. The adverse effects of noise pollution can impact human health, causing stress, sleep disturbances, hearing loss, and other health issues.

To mitigate noise pollution, urban planning and zoning regulations may be implemented to control noise levels in different areas. Additionally, individuals can take measures such as using

noise-canceling devices, earplugs, or soundproofing their homes to minimize exposure to excessive noise.

Various organizations and government agencies work to establish guidelines and regulations to address and manage noise pollution. The World Health Organization provides guidelines on acceptable noise levels for different settings to protect public health.

3.5.1 Managing noisy pollution

Managing noise pollution involves various strategies and measures to reduce or control unwanted sound in the environment. Here are some effective ways to manage noise pollution:

- **Regulations and Policies:** Implement and enforce noise regulations and policies at the local, regional, and national levels. This may include zoning laws, construction site guidelines, and restrictions on certain activities during specific hours.
- **Urban Planning:** Plan and design urban spaces with noise reduction in mind. This can involve creating green spaces, incorporating noise barriers, and strategically placing buildings to minimize sound propagation.
- **Noise Barriers:** Install physical barriers such as soundproof walls, fences, and noise barriers along highways, railways, and other noisy areas to block or absorb sound.
- **Public Awareness and Education:** Raise awareness about the effects of noise pollution and educate the public on responsible noise behavior. Encourage individuals and businesses to adopt practices that reduce noise.
- **Traffic Management:** Implement traffic management strategies to reduce noise from vehicles. This can include promoting public transportation, regulating traffic flow, and maintaining road surfaces to minimize tire noise.
- **Greenery and Vegetation:** Planting trees and creating green buffers can help absorb sound and reduce the impact of noise pollution. Green spaces act as natural barriers and contribute to a quieter environment.
- **Building Design:** Incorporate sound-absorbing materials and techniques into the design of buildings to minimize interior noise. Proper insulation and double-glazed windows can help reduce external noise.

- **Technology and Innovation:** Explore and implement new technologies that help reduce noise, such as quieter transportation options, noise-canceling technologies, and advancements in industrial processes.
- **Community Involvement:** Involve local communities in noise management decisions. Community feedback can be valuable in identifying specific noise issues and finding appropriate solutions.
- **Enforcement:** Ensure strict enforcement of noise regulations and penalties for non-compliance. This can deter individuals and businesses from engaging in noisy activities.
- By combining these approaches, communities can effectively manage and mitigate the impact of noise pollution, creating quieter and more livable environments.

Self-check 3.5.

1. Noise becomes harmful when it exceeds _____ and is painful above ____.
2. _____ refers to the presence of excessive, disruptive, or harmful noise in the environment.
3. The World Health Organization defines noise above 65 decibels (dB) as noise pollution. To be precise, noise becomes harmful when it exceeds __ decibels (dB).
4. _____ involves various strategies and measures to reduce or control unwanted sound in the environment.

3.6 Occupational hygiene

Occupational hygiene, also known as industrial hygiene, is a field of study and practice that focuses on the anticipation, recognition, evaluation, and control of workplace hazards that may affect the health and well-being of workers. The primary goal of occupational hygiene is to prevent occupational illnesses and injuries by identifying and managing potential exposures to various physical, chemical, biological, and ergonomic hazards in the workplace.

Occupational hygiene is the anticipation, recognition, evaluation, control, and confirmation of protection from risks associated with exposures to hazards in, or arising from, the workplace that may result in injury, illness, impairment, or affect the well-being of workers and members of the community.

These hazards or stressors are typically divided into the
categories biological, chemical, physical, ergonomic and psychosocial. The risk of a health effect from a given stressor is a function of the hazard multiplied by the exposure to the individual or group.

Key aspects of occupational hygiene include:

- **Hazard Identification:** Identifying and understanding the different types of hazards present in the workplace, such as toxic substances, noise, radiation, and ergonomic stressors.
- **Risk Assessment:** Evaluating the level of risk associated with exposure to specific hazards, considering factors like concentration, duration, and frequency of exposure.
- **Exposure Monitoring:** Utilizing various monitoring techniques to measure and assess the levels of contaminants in the workplace environment.
- **Control Measures:** Implementing strategies to control or minimize exposure to hazards, including engineering controls, administrative controls, and personal protective equipment
- **Regulatory Compliance:** Ensuring that workplaces comply with occupational health and safety regulations and standards set by government agencies.

- **Education and Training:** Providing education and training to workers on the risks associated with their work environment and the measures they can take to protect themselves. Occupational hygienists play a crucial role in creating and maintaining a safe and healthy work environment. They often work alongside other health and safety professionals to develop and implement comprehensive occupational health programs.

Self-check 3.6.

1. _____ is the anticipation, recognition, evaluation, control, and confirmation of protection from risks associated with exposures to hazards in, or arising from, the workplace that may result in injury, illness, impairment, or affect the well-being of workers and members of the community.
2. What is the primary goal of occupational hygiene?
3. _____ play a crucial role in creating and maintaining a safe and healthy work environment.

3.7 Environmental health laws and regulations

Environmental health laws and regulations refer to a set of rules and standards established by governments to protect public health and the environment. These laws address various aspects of environmental health, including air and water quality, waste management, hazardous substances, and public safety.

It's essential to note that environmental health laws and regulations can vary significantly between countries and regions. Local authorities, environmental agencies, and international organizations often play crucial roles in their enforcement and implementation.

3.7.1 Environmental health laws and regulations objectives enforcing policy

Environmental health laws and regulations aim to safeguard human well-being by addressing risks arising from the environment. These laws are vital for maintaining a healthy ecosystem and preventing adverse impacts on public health.

Key aspects include:

Environmental Policy Frameworks: Nations, such as Ethiopia, establish comprehensive environmental policies to guide sustainable practices and protect current and future generations.

Legal Rules for Environmental Health: Environmental health laws, as detailed in publications like "Environmental Law and Public Health," provide legal mechanisms to mitigate health risks originating from the environment.

CDC Resources: The CDC actively contributes to the development of environmental health laws and policies, offering comprehensive information on state statutes and regulations.

Regulations under Public Health Acts: Specific regulations, like the Environmental Health (Public Health Act) Regulations, play a crucial role in addressing environmental health concerns, often repealing previous acts for streamlined governance.

1. **Multilevel Enforcement**: Environmental laws are enacted and enforced at local, national, and international levels, with principles and policies directing their implementation.
2. **Diverse Legislation**: Legislation spans various domains, from animal boarding establishments to food safety, emphasizing the broad scope of environmental health regulations.

In essence, environmental health laws and regulations form a comprehensive framework, ensuring the well-being of both individuals and the planet.

Self-check 3.7.

1. _____ refer to a set of rules and standards established by governments to protect public health and the environment
2. _____are laws requiring the assessment of the potential environmental impacts of proposed projects before they are approved .
3. _____ are comprehensive environmental policies to guide sustainable practices and protect current and future generations.

3.8 Community engagement

Community Engagement is the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people. It is a powerful vehicle for bringing about environmental and behavioral changes that will improve the health of the community and its members. It often involves partnerships and coalitions that help mobilize resources and influence systems, change relationships among partners, and serve as catalysts for changing policies, programs, and practices.

While there are almost as many definitions out there as there are people trying to define it, in its simplest terms community engagement seeks to better engage the community to achieve long-term and sustainable outcomes, processes, relationships, discourse, decision-making, or implementation. To be successful, it must encompass strategies and processes that are sensitive to the community-context in which it occurs.

Engagement is not generally driven by a 'model' so much as by a framework of guiding principles, strategies, and approaches. This framework is based on principles that respect the right of all community members to be informed, consulted, involved and empowered. Community engagement employs and range of tools and strategies to ensure success. It also places a premium on fostering and enhancing trust as a critical element in long-term, sustainable engagement and effective governance.

The linking of the term 'community' to 'engagement' serves to broaden the scope, shifting the focus from the individual to the collective, with the associated implications for inclusiveness to ensure consideration is made of the diversity that exists within any community. Community engagement' is therefore a strategic process with the specific purpose of working with identified

groups of people, whether they are connected by geographic location, special interest, or affiliation to identify and address issues affecting their well-being.

Community engagement plays a crucial role in promoting environmental health. Here are some key aspects and strategies related to community engagement in this context:

Education and Awareness

- Community engagement starts with educating and raising awareness among the residents about the importance of environmental health.
- Workshops, seminars, and informational campaigns can help inform the community about the impact of their actions on the environment.

Collaboration with Local Organizations

- Partnering with local environmental organizations, non-profits, and community groups can amplify efforts in promoting environmental health.
- Joint projects and initiatives can be more effective in addressing specific local environmental challenges.

Inclusive Decision-Makin

- Involving the community in decision-making processes related to environmental policies and projects ensures that their concerns and perspectives are considered.
- This inclusivity fosters a sense of ownership and responsibility among community members.

Community Action Programs

- Initiating community action programs, such as tree planting, waste reduction campaigns, and clean-up events, can actively involve residents in positive environmental practices.
- These programs not only contribute to environmental health but also build a sense of community cohesion.

Green Spaces and Recreation

- Creating and maintaining green spaces within communities encourages outdoor activities and promotes a healthier environment.
- These spaces also serve as a platform for community gatherings, fostering a sense of unity.

Advocacy and Policy Support

- Empowering community members to advocate for environmentally friendly policies at the local and regional levels can lead to lasting changes.
- Providing resources and support for community leaders to engage with policymakers is essential for effective advocacy.

Technology and social media

- Leveraging technology, including social media platforms, can help in disseminating information quickly and engaging a wider audience.
- Online platforms can be used for organizing events, sharing success stories, and building a sense of environmental stewardship.

Monitoring and Reporting

- Establishing community-based monitoring systems allows residents to report environmental issues promptly.
- This feedback loop helps authorities address concerns in a timely manner, fostering a sense of accountability.

Self-check 3.8.

1. _____ is the process of working collaboratively with and through groups of people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the well-being of those people.
2. _____, _____ and _____ can help inform the community about the impact of their actions on the environment.
3. _____ are tree planting, waste reduction campaigns, and clean-up events .

Unit Summary

Promoting environmental hygiene involves adopting practices and behaviors that contribute to the cleanliness and sustainability of the environment. Environmental hygiene pertains to the collective measures taken to control and improve the cleanliness of our natural surroundings and the subsequent impact on health and wellness

The concept of environmental hygiene is intrinsically linked to public health. In healthcare settings, environmental hygiene takes on a heightened significance. The risks of infections and disease spread can be mitigated through rigorous sanitation practices, proper waste disposal, and the constant cleaning of surfaces. The urban environment presents unique challenges for environmental hygiene.

Healthy housing generally refers to living spaces that promote physical and mental well-being. Homes should be designed with safety in mind, including proper electrical systems, secure windows and doors, and fire safety measures.

Pest control refers to the management or regulation of pests, which are organisms that can negatively impact human activities, agriculture, and the environment.

Adverse health effects of air pollution, particularly from exposure to pollutants like nitrogen dioxide and sulfur dioxide

Noise pollution refers to the presence of excessive, disruptive, or harmful noise in the environment. It is typically caused by various sources, including traffic, industrial activities, construction, and social events. The adverse effects of noise pollution can impact human health, causing stress, sleep disturbances, hearing loss, and other health issues.

Occupational hygiene, also known as industrial hygiene, is a field of study and practice that focuses on the anticipation, recognition, evaluation, and control of workplace hazards that may affect the health and well-being of workers. The primary goal of occupational hygiene is to prevent occupational illnesses and injuries by identifying and managing potential exposures to various physical, chemical, biological, and ergonomic hazards in the workplace.

Environmental health laws and regulations refer to a set of rules and standards established by governments to protect public health and the environment. These laws address various aspects of environmental health, including air and water quality, waste management, hazardous substances, and public safety.

Community engagement in promoting environmental health involves a multifaceted approach that combines education, collaboration, inclusivity, action, advocacy, and the use of technology. By actively involving residents in the process, communities can work towards sustainable environmental practices and a healthier living environment.

Unit Review Questions

Instruction: Give brief answer for the following review questions:

1. Discusses how to promote environmental hygiene?
2. List some key factors associated with healthy housing?
3. Define industrial hygiene?
4. Describe noisy pollution?
5. List common roles of community in environmental hygiene?

Project Work 1

Project Work

Based on the information given below conduct community based hygiene assessment and submitted your report to your instructor.

Assume that in your kebele there are similar 10 clusters (menders) among which mender 01 has 30 households. The expected total households and populations of the kebele are 300 and 1500 respectively. The kebele Health extension and nearby health center urges you to conduct community hygiene assessment for mender 01 and kebele.

1. Assess by the presence of hygienic hand washing procedures in the menders and kebele by using instruction manual for hand washing procedures that should be available in public facilities and your student module
2. Do observation with kebele Health extension workers and classify residents personal hygiene status as-not clean, somewhat clean, clean, very clean, and super clean
3. By working with other community health workers undertake indirect way of hygiene assessment by discussing why some infections are more prevalent in one village than another.

Answer Keys for Self-Check Questions

Unit 1 Self-Check Answers:

Self check 1.2.

1. Personal hygiene
2. Hygiene

Self check 1.3.

1. Hygienic hand washing

Self check 1.4

2. Critical situation to wash hands

Self check 1.5.

1. Bathing
2. skin dryness

Self check 1.6.

1. Oral hygiene
2. Flossing

Self check 1.7.

1. cleaning and trimming
2. swelling

Self check 1.8.

1. dandruff and skin infections
2. Ringworm

Self check 1.9.

1Two

Twice and 12 times per week for outerwear

Unit 2 Self-Check Answers:

Self-check 2.2.

1. Promoting food hygiene
2. Proper food handling

3. Contaminated water and ingredients
4. Personal Hygiene of Food Handlers

Self -check 2.3

1. Principles of food hygiene
2. Safe Storage Practices
3. HACCP

Self -check 2.4.

1. Separating
2. Chilling

Self -check 2.5.

1. Water supply
2. Water born diseases
3. Water related diseases
4. Prevention of water born diseases
5. Promoting water supply

Self -check 2.6

1. Safe water
2. Palatable water
3. Provision of safe drinking water

Self -check 2.7.

1. Water treatment
2. Water contamination
3. Filtration
4. Water quality standards

Unit 3 Self-Check Answers:

Self -check 3.2.

1. Promoting environmental hygiene
2. environmental hygiene
3. health-full housing

Self -check 3.3.

1. Paste control

2. Chemical paste control
3. Cultural pest control
4. Integrated pest management

Self -check 3.4

1. Air quality
2. Environmental protection authority
3. AirVisual

Self -check 3.5.

1. 75 decibels (dB) and 120 dB
2. Noisy pollution
3. 75
4. Managing noise pollution

Self -check 3.6

1. Occupational hygiene
2. to prevent occupational illnesses and injuries
3. occupational hygienist

Self -check 3.7.

1. Environmental health laws and regulations
2. Environmental impact assessment law
3. Environmental Policy Frameworks

Self -check 3.8.

1. Community Engagement
2. Workshops, seminars, and informational campaigns
3. positive environmental practices

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