Draft Study Materials

Tele Health Service Coordinator

(Qualification Pack: Ref. Id. HSS/Q5801)

Sector: Health & Paramedical Science

(Grade XII)

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
(a constituent unit of NCERT, under Ministry of Education, Government of India)
Shyamla Hills, Bhopal- 462 002, M.P., India
http://www.psscive.ac.in

Preface

Vocational Education is a dynamic and evolving field, and ensuring that every student has access to quality learning materials is of paramount importance. The journey of the PSS Central Institute of Vocational Education (PSSCIVE) toward producing comprehensive and inclusive study material is rigorous and time-consuming, requiring thorough research, expert consultation, and publication by the National Council of Educational Research and Training (NCERT). However, the absence of finalized study material should not impede the educational progress of our students. In response to this necessity, we present the draft study material, a provisional yet comprehensive guide, designed to bridge the gap between teaching and learning, until the official version of the study material is made available by the NCERT. The draft study material provides a structured and accessible set of materials for teachers and students to utilize in the interim period. The content is aligned with the prescribed curriculum to ensure that students remain on track with their learning objectives.

The contents of the modules are curated to provide continuity in education and maintain the momentum of teaching-learning in vocational education. It encompasses essential concepts and skills aligned with the curriculum and educational standards. We extend our gratitude to the academicians, vocational educators, subject matter experts, industry experts, academic consultants, and all other people who contributed their expertise and insights to the creation of the draft study material.

Teachers are encouraged to use the draft modules of the study material as a guide and supplement their teaching with additional resources and activities that cater to their students' unique learning styles and needs. Collaboration and feedback are vital; therefore, we welcome suggestions for improvement, especially by the teachers, in improving upon the content of the study material.

Deepak Paliwal
(Joint Director)
PSSCIVE, Bhopal

Date: 20 June 2024

STUDY MATERIAL DEVELOPMENT COMMITTEE

Members

- Mr. Rahul Deshmukh, Assistant Professor (Nursing), Department of Health and Paramedical Sciences, PSS Central Institute of Vocational Education, Shyamla Hills, Bhopal.

Member Coordinator

Dr. A. Nayak, Professor & Head, Department of Health and Paramedical Sciences,
PSS Central Institute of Vocational Education, Shymala Hills, Bhopal.

Table of Contents

S.No.	Title	Page No.
1.	**Module 1: Health Care Services Provider**	1
	Learning Outcomes	1
	Module Structure	1
	Session 1: Tele-Diagnostic services	1
	Activities	7
	Check Your Progress	7
	Session 2: Introduction of Pharmacy and Emergencies Medicine	8
	Activities	13
	Check Your Progress	14
	Session 3: Forms and Routed of Medication	15
	Activities	21
	Check Your Progress	22
	Session 4: Classification of Drugs	23
	Activities	32
	Check Your Progress	33
2.	**Module 2: Maintain a Safe, Healthy and Secure Working**	34
	Learning Outcomes	34
	Module Structure	35
	Session 1: Safety, Emergency Medical Response and First Aid	35
	Activities	40
	Check Your Progress	40
	Session 2: Performing the Role of Tele Health Care Service Coordinator in Fever, Heat, Stroke, Back Pain, Asthma, and Food Born Illness	41
	Activities	48
	Check Your Progress	48
	Session 3: Immunization	48
	Activities	53
	Check Your Progress	53
	Session 4: Personal Hygiene Practices for Tele Health Services Coordinator	54
	Activities	57
	Check Your Progress	57
	Session 5: Maintain Safe, Healthy and Secure Environment	58
	Activities	65
	Check Your Progress	65

3.	**Module 3: Infection Control and Bio-Medical Waste Management**	66
	Learning Outcomes	66
	Module Structure	66
	Session 1: Infection Control	67
	Activities	71
	Check Your Progress	72
	Session 2: Bio-Medical Waste Management	72
	Activities	78
	Check Your Progress	78
	Session 3: Sources and Disposal of Bio-Medical Waste	79
	Activities	81
	Check Your Progress	82
	Session 4: Segregation and Transportation of Bio-Medical Waste	83
	Activities	87
	Check Your Progress	87
	Session 5: Role of Hospital Staff in Bio-Medical Waste Management	88
	Activities	90
	Check Your Progress	90
4.	**Module 4: Tele Health Facility and Health Record**	91
	Learning Outcomes	91
	Module Structure	91
	Session 1: Record and Report	91
	Activities	100
	Check Your Progress	100
6.	**Answers**	101
	Glossary	
	Further Readings	

Module 1 Health Care Services Provider

Introduction

A Telehealth services coordinator, a service and component important in the Healthcare sector which is going rapidly over the years. India has a shortfall of 6 million health care professionals and India is far behind the global standards in term of availability of health care services. The job role of Telehealth services coordinator is one such area where the shortage of this kind of manpower is felt.

Learning Outcomes

After completing this module, you will be able to:

- Discuss the importance of local pharmacies/diagnostic centres for ensuring medicine availability.
- Explain components of prescription dose.
- Describe the emergency services which be provided at Telehealth set-up.
- Describe the importance of local emergency resources for handling medical and non-medical emergency situations.

Module Structure

Session 1: Tele Diagnostic Services

Session 2: Introduction of Pharmacy and Emergencies Medicine

Session 3: Forms and Routes of Medication

Session 4: Classification of Drugs

Session 1: Tele Diagnostic Services

Tele-diagnostic services refer to the use of telecommunication technology to provide medical diagnostic services remotely. These services enable healthcare providers to assess and diagnose patients without the need for in-person visits, which can be especially valuable in situations where physical access to healthcare facilities is limited, such as during a pandemic, in rural or underserved areas, or for patients with mobility issues.

Some of the major aspects and components of tele-diagnostic services:

- **Communication Technology:** Tele-diagnostic services rely on various communication technologies, including video conferencing, audio calls, and secure messaging platforms. These technologies allow healthcare professionals

to interact with patients in real-time or asynchronously.

- **Remote Consultations:** Patients can connect with healthcare providers including doctors, specialists, radiologists and pathologists through tele-diagnostic services and patients can discuss their symptoms, medical history and concerns.

Fig.1.1 Tele-diagnostic services

- **Medical Imaging:** Tele-diagnostic services often include transmission and interpretation of medical imaging studies such as X-ray, CT scan, MRI, and ultrasound. Patients can share results electronically with remote health care professionals for diagnosis.

- **Pathology Services:** Pathologists can remotely analyze tissue samples and diagnostic tests such as biopsies and blood tests by receiving digital images or data from local laboratories. This allows quick diagnosis and treatment planning.

- **Remote Monitoring:** For chronic conditions or ongoing care, tele-diagnostic services may include remote monitoring of vital signs such as blood pressure, heart rate, and glucose levels. Patients can use wearable devices or home monitoring devices to transmit data to their healthcare providers.

- **Prescription and Treatment:** Following a tele-diagnostic consultation, healthcare providers can prescribe medications, recommend treatments, or provide lifestyle advice remotely. Patients can then access their prescribed medications through local pharmacies.

- **Patient Education:** Tele-diagnostic services can also include patient education and counseling, helping individuals better understand their conditions, treatment options, and self-care techniques.

- **Security and Privacy:** Ensuring the security and privacy of patient data is paramount in tele-diagnostic services. Compliance with healthcare regulations and the use of secure communication platforms are essential to protect patient information.

- **Cost and Accessibility:** Tele-diagnostic services can potentially reduce healthcare costs by minimizing the need for physical office visits and travel expenses. They also improve accessibility to healthcare for individuals who live

in remote areas or have limited mobility.

- **Emergency Consultations:** In emergency situations, tele-diagnostic services can connect patients with emergency room physicians, allowing for quick assessments and guidance on seeking immediate care.

It's important to note that while tele-diagnostic services offer many benefits, they may not be suitable for all medical situations. Some conditions require physical examinations or in-person procedures. The appropriateness of tele-diagnosis depends on the specific healthcare needs of the patient and the judgment of the healthcare provider.

Services in Clinical Introduction to Telehealth Laboratories

Telehealth services have revolutionized the healthcare industry by bridging the gap between healthcare providers and patients, making healthcare more accessible and convenient. Diagnostic laboratories, which play a vital role in diagnosing and monitoring various medical conditions, have also adopted Telehealth to improve their services. This article explores the integration of Telehealth services into the primary setup of clinical laboratories and highlights the benefits.

Telehealth service coordinator in Clinical Laboratories:

Enhanced Accessibility: Telehealth services enable patients to access clinical laboratories' services without the need for physical visits. This is particularly beneficial for patients in remote or underserved areas who may have limited access to healthcare facilities.

Improved Efficiency: Telehealth allows for faster and more efficient communication between healthcare providers and clinical laboratories. Physicians can send electronic test orders, and laboratories can transmit results electronically, reducing the time required for diagnosis and treatment planning.

Fig.1.2 Laboratory in hospital

Reduced Costs: Telehealth can lead to cost savings for both patients and healthcare facilities. Patients save on travel expenses, and healthcare providers can streamline their operations by reducing the need for physical infrastructure and administrative staff.

Real-time Consultations: Telehealth facilitates real-time consultations between pathologists, lab technicians, and healthcare providers. This can lead to faster

decision-making, especially in critical cases.

Remote Monitoring: Clinical laboratories can provide remote monitoring services, allowing patients with chronic conditions to regularly check their health status without frequent visits to the lab. This is particularly valuable for conditions like diabetes and hypertension.

Challenges and Considerations

1. **Data Security:** Protecting patient data is a paramount concern in Telehealth. Clinical laboratories must implement robust data security measures to comply with healthcare privacy regulations.

2. **Technical Infrastructure:** Both healthcare providers and clinical laboratories need reliable internet connections and appropriate Telehealth software and hardware. Upgrading existing infrastructure can be costly.

3. **Regulatory Compliance:** Telehealth services must comply with regulatory standards specific to clinical laboratories. Ensuring adherence to quality control and accreditation requirements is essential.

4. **Licensure and Credentialing:** Healthcare providers participating in Telehealth services must adhere to state or country-specific licensure and credentialing requirements, which can vary widely.

5. **Patient Education:** Patients need to be educated about how to use Telehealth services effectively. This includes understanding how to collect and send samples if required for testing.

Patient Consultation and Preparation

The process begins with a patient consultation, often conducted through a Telehealth platform or video call. The healthcare provider discusses the patient's medical history, symptoms, and the need for diagnostic testing. If physical examinations or sample collection (e.g., blood or urine) are required, the patient is provided with clear instructions on how to perform these tasks at home.

Diagnostic evaluation: The healthcare provider determines the necessary diagnostic tests based on the patient's symptoms, medical history, and clinical judgment. Diagnostic test orders may be generated electronically, and relevant details are communicated to the patient, including the type of test, date, and any specific preparations required (e.g., fasting for blood tests, urine test).

Sample Collection (if applicable): If the test involves sample collection, such as a blood or urine sample, the patient follows the instructions provided to collect the sample at home. Some tests may require the assistance of a local health care professional for sample collection.

Sample Handling and Packaging: The patient carefully handles and packages the collected sample, ensuring it is properly labeled and stored according to

instructions.

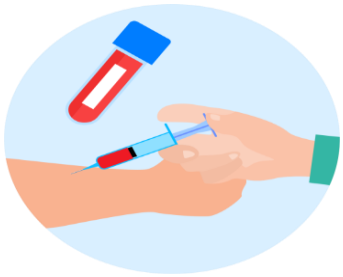

Fig.1.3 Blood sampling

Sample Transmission: The patient either physically transports the sample to a designated drop-off location (if required) or arranges for pickup by a courier service. In some cases, samples may be sent directly to a clinical laboratory that specializes in tele-diagnostic testing.

Laboratory Testing: Once the sample reaches the clinical laboratory, it undergoes the necessary diagnostic testing procedures. Laboratory technicians or automated systems analyze the sample, and the results are generated electronically.

Result Generation and Documentation: The clinical laboratory generates a report containing the test results, often in electronic format. Quality control processes ensure the accuracy and reliability of the results.

Result Transmission: The test results are transmitted securely to the healthcare provider through electronic health records (EHR) systems or secure communication platforms. Some Telehealth platforms may also allow patients to access their results securely.

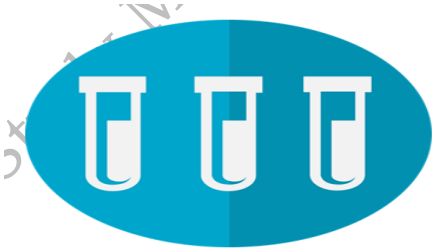

Fig.1.4 collecting sample

Result Review and Diagnosis: The healthcare provider reviews the test results, interprets them in the context of the patient's medical history and symptoms, and arrives at a diagnosis or treatment plan.

Patient Discussion: The healthcare provider schedules a follow-up Telehealth appointment with the patient to discuss the results, provide recommendations, and answer any questions.

Treatment Planning: Based on the diagnosis and test results, the healthcare provider develops a treatment plan, which may include medication, lifestyle changes, further testing, or referrals to specialists.

Follow-up: Telehealth follow-up appointments are scheduled as needed to monitor

the patient's progress, adjust treatment plans, and ensure ongoing care.These steps outline the general process of a tele-diagnostic test, which combines remote consultations, sample collection (if required), laboratory testing, and electronic result transmission to provide medical diagnosis and care. The specific details may vary depending on the type of test, the healthcare provider's practices, and the Telehealth technology used.

Role of Telehealth Care service Coordinator in laboratories:

Lab technicians play important roles in a variety of scientific and medical settings, including clinical laboratories, research facilities, and industrial laboratories. Their primary responsibility is to support the work of scientists, researchers, and medical professionals by performing a wide range of laboratory tasks and ensuring the accuracy and reliability of experimental and clinical results. Here are the typical roles and responsibilities of laboratory technicians

Fig.1.5 Role of Telehealth Coordinator

Sample Collection and Handling:

- Collecting, labeling, and organizing samples, specimens, or materials for analysis.
- Ensuring proper storage and preservation of samples to maintain their integrity.

Instrument Operation: Operating and maintaining laboratory equipment and instruments, such as microscopes, centrifuges, spectrophotometers, and analyzers. Calibrating and troubleshooting equipment to ensure accurate results.

Testing and Analysis:

- Conducting various laboratory tests and experiments as per established protocols and procedures.
- Performing chemical, biological, or physical analyses on samples to generate data for research or diagnosis.

Data Recording and Reporting:

- Accurately recording experimental data, observations, and results in laboratory notebooks or computer databases.
- Preparing reports and summaries of findings for review by scientists, researchers, or clinicians.

Quality Control and Assurance: Monitoring and maintaining quality control measures to ensure the accuracy and reliability of test results. Identifying and addressing any issues that may affect the quality of data.

Safety and Compliance: Adhering to safety protocols, including the proper handling of hazardous materials, chemicals, and biological substances. Complying with laboratory regulations and protocols, including those related to ethics and confidentiality.

Inventory Management: Managing laboratory supplies, reagents, and chemicals, including ordering and restocking as needed. Keeping track of inventory levels and ensuring proper storage conditions.

Lab Maintenance:
- Keeping the laboratory clean, organized, and well-maintained to ensure a safe and efficient working environment.
- Performing routine maintenance on laboratory equipment.

Communication and Collaboration: Collaborating with other lab staff, scientists, researchers, and healthcare professionals to achieve research or diagnostic goals. Communicating findings and updates effectively to the relevant parties.

Training and Supervision:
- Training and supervising junior lab technicians, interns, or assistants.
- Assisting in the orientation and on boarding of new lab personnel.

Problem-Solving:
- Identifying and troubleshooting technical issues that may arise during experiments or analyses.
- Suggesting solutions and improvements to enhance laboratory processes.

Continuing Education: Staying updated on the latest laboratory techniques, technologies, and best practices through ongoing education and professional development.

Lab technicians play a important role in ensuring the success of scientific research, medical diagnosis, and various industrial processes. Their attention to detail, precision, and commitment to following protocols are essential for producing accurate and reliable data.

Activities

Activity 1: - Visit health care laboratories and observe the facilities available and Collect pictures.
Activity 2: - Discuss the functions of laboratory equipment in class and prepare a list of equipment

Check Your Progress

A. Match the following

	A		B
1	Communication Technology	1	X-ray, CT scan, MRI
2	Medical Imaging	2	video conferencing, audio calls
3	Pathology Services	3	counselling
4	Patient Education	4	Physician
5	Security and Privacy	5	Diagnostic test
6	Emergency Consultations	6	Data Privay

B. Short Answer Questions

1. Define Tele diagnostic services.
2. What is the importance of Tele diagnostic services in modern time?
3. Write the duties of telehealth service coordinator in clinical laboratories.

C. Long answer Questions

1.Explain the importance of Telehealth platform during patient consultation?

2. Write the role of telehealth care service coordinator in laboratories.

Session 2: Introduction of Pharmacy and Emergencies Medicine

Administration of medicine requires the attention and care of the treating doctors, nurses, care gives or evens a General Duty Assistant in essential situations. The basic principle and methods of drug administration are described in this session.

Methods of drug administration and its procedures have to meet licensing regulations in storage, safe handling and in dispensing of medicines. Medicines carry risks which can be serious threat to life if not dispensed to the patient properly. This unit provides information on the precautions to be followed while dealing with medication.

Pharmacy

Pharmacy is the branch of health sciences that focuses on the safe and effective use of medications. Pharmacists are highly trained professionals who work in various settings, including community pharmacies, hospitals, and clinics.

The primary responsibilities of medication

Dispensing Medications: Pharmacists ensure that patients receive the correct medications prescribed by healthcare providers. They provide information on proper dosage, administration, and potential side effects.

Patient Counseling: Pharmacists educate patients on how to take medications, potential interactions with other drugs, and lifestyle considerations. This helps improve adherence to treatment plans.

Medication Management: They collaborate with healthcare teams to manage medication regimens, adjust dosages, and address any issues related to drug therapy.

Compounding: In some cases, pharmacists may prepare customized medications based on specific patient needs, such as adjusting dosage forms or removing allergens.

Public Health: Pharmacists contribute to public health initiatives by promoting vaccinations, providing information on over-the-counter medications, and offering advice on healthy lifestyles.

Emergency Medicine:
Emergency medicine is a medical specialty that focuses on the immediate care of acutely ill or injured patients. Emergency medicine professionals, including physicians and nurses, work in emergency departments and provide time-sensitive interventions. Key aspects include:

Triage: Quickly assessing and prioritizing patients based on the severity of their condition to ensure those in critical condition receive immediate attention.

Resuscitation: Administering life-saving interventions, such as cardiopulmonary resuscitation (CPR) and advanced cardiac life support (ACLS), to patients experiencing cardiac arrest or other life-threatening events.

Stabilization: Providing rapid and effective treatment to stabilize patients with acute conditions, such as severe injuries, respiratory distress, or allergic reactions.

Diagnostic Skills: Utilizing a range of diagnostic tools, including imaging and laboratory tests, to rapidly identify the cause of a patient's symptoms and guide appropriate treatment.

Collaboration: Coordinating care with other medical specialties to ensure comprehensive and seamless treatment for patients requiring ongoing care beyond the emergency setting.

Rights of Drug Administration
A drug is any substance that alters physiological function, with the potential for affecting health. Medicine may be defined as a substance used to promote health, to prevent illness, to diagnose, to alleviate or cure disease. A medication is a substance used in the diagnosis, treatment, relief or prevention of health alterations. A drug is a chemical substance that modifies body function when taken into the living organism which may or may not have a therapeutic effect. A medication is a drug administered for its therapeutic effect. Thus, all medications are drugs, but not all drugs are medications.

The Seven "Rights

When helping a person you must check and double check that you are dealing

with
1. The right medicine
2. The right patient
3. The right time
4. The right dose
5. The right route
6. The right form
7. The right documentation

Fig.1.6 Rights of Drug Administration

The Right Medicine

Do NOT use any medicine that has a label that you cannot read. Do NOT use any medicine unless it has a complete label. Read and double check the label against the medicine record at least three times and tell the person the name of the medicine before you help them. If the person says they do not get this medicine, STOP. Do not help Report this to your supervisor/doctor. If a patient takes the wrong medicine, it must be reported to the Doctor immediately.

The Right Patient

You must check the identity of the person before you help them with the medicines.

The Right Time

The right time is 30minutes before and up to 30minutes after the time on the bottle and the order. For example, a person can take medicine any time between 9:30am and 10:30am if the medicine is to be given once a day. It is an error if it is taken at9 am or at11am.This, too, must be reported PRN medicines are not taken at a special time of the day. They are taken only when they are needed but not more often than the order states. For example, the doctor may order aspirin 4qhprn for pain. This a spirin can be given when the person has pain but there must be duration of at least 4 hours between doses.

The Right Dose

Check and double check the dose. Scored tablets must be cut in half if the labelsays1/2tablet.It is an error when the person takes more or less than he/she should. This error must also be reported.

The Right Route

Check the label to find out the right route. A Buccal medication should not be swallowed (oral route). It is an error when a person takes a medicine with the wrong route. This error must be reported.

The Right Form

Check the label against the order to make sure that you have the right form. A pill can not be given if the order says a liquid. It is An error when a person takes the wrong form. This too must be reported.

The Right Documentation

All documentation must be complete and accurate.

Forgotten Medicines

Report and document if the person forgets to take medicine or you forget to remind him/her it is time to take medicine.

Observing and Record Keeping and Documentation

You must observe for a person's response to medicine. Again, some of these responses are wanted and others are not. For example, you must take a person's blood pressure to make sure that the medicine is making it lower when the person is taking a blood pressure medicine. This is a wanted effect. However, if that person becomes dizzy and their blood pressure is too low, this is NOT a wanted response. You must observe and record both the wanted and the unwanted responses to the person's medicine(s).

A medication that is taken, forgotten, held or refused by the patient must be written on the patient's medicine record. Other information like vital signs and apical pulse rate must also be recorded when it is needed. For example, the apical rate for a full minute must be taken and recorded before a person takes digoxin. If the rate is 54or more, the person can take it.The dose must be held and the supervis or must be notified if the rate is lessthan54.This must also be written in the person's record.

Complete medication records must include the following details of a patient:

- Fullname
- Room and bed number
- Age
- Name of Doctor
- Description about allergies

- Medicine(s) to betaken
- Dose for each medicine
- Route for each medicine
- Form for each medicine
- Date and the time that the order was written
- Date(s)and time(s)that the medicine is to be taken/given
- Start and end dates of the order
- Initials signatures of all who have helped with the medicine(s).

Some of the legal rules for record keeping are:

- Do NOT use white fluid if you make a mistake. If you make a mistake, cross it off with one thin line. Do NOT cover the mistake with scribble. Write "error", sign your name and date
- Write so that other people can read what you write.
- Do NOT scribble.
- Use dark ink on records.

Telehealth setup services that can be provided in times of emergency

Telehealth services can cover a range of emergency medical needs, providing remote assistance and support. Some emergency services that can be offered through Telehealth include:

- Emergency Medical Consultations: Instant access to healthcare professionals for urgent medical advice.
- Psychiatric Crisis Intervention: Tele-psychiatry can provide immediate support for individuals in mental health crises.
- Remote Monitoring: Continuous monitoring of vital signs for patients with chronic conditions to detect emergencies early.
- Medication Management: Assistance with medication adjustments or changes in real-time.
- Tele-triage: Remote assessment of medical conditions to determine the urgency of care needed.
- Tele-stroke Services: Rapid evaluation and treatment of stroke patients through video consultations.
- Remote Trauma Consultation: Initial assessment and guidance for trauma cases before the patient reaches a hospital.
- Tele EMS (Emergency Medical Services): Dispatching emergency medical services to the location based on video assessments.
- Virtual Urgent Care: Immediate access to healthcare professionals for non-life-threatening urgent care needs.
- Tele-pharmacy Services: Emergency prescription refills and medication consultations through virtual platforms.
- Disaster Response Support: Coordination of emergency medical response during natural disasters or large-scale emergencies.
- Tele NICU (Neonatal Intensive Care Unit): Remote monitoring and consultation for critically ill new-borns.
- Remote Wound Care: Evaluation and guidance for managing wounds and

injuries.

- Tele monitoring for Respiratory Emergencies: Monitoring and management of respiratory distress in real-time.
- Tele-EMS for Pre-hospital Care: Providing guidance to emergency medical personnel on the scene before transportation.

Local emergency resources to deal with medical and non-medical emergencies

In a medical or non-medical emergency, having local resources at your fingertips can make a significant difference. Here's a list of resources that might be helpful

Medical Emergency Resources

- Emergency Medical Services (EMS): Call your local emergency number (e.g., 108 in the India) for immediate medical assistance.
- Local Hospitals and Urgent Care Centres: Have the contact information for nearby hospitals and urgent care facilities.
- Poison Control Centre: Save the number for your local poison control center.
- Local Clinics and Pharmacies: Know the locations and contact information for nearby medical facilities.
- Primary Care Physician: Have your primary care doctor's contact information readily available.
- Specialized Medical Services: If applicable, know where to find specialized medical services in your area.

Non-Medical Emergency Resources

- Police Department: Know the non-emergency number for your local police department.
- Fire Department: Have the contact information for your local fire department.
- Local Law Enforcement Agencies: Be aware of any relevant local law enforcement agencies.
- Emergency Management Office: Check if your area has an emergency management office for disaster-related assistance.
- Utility Companies: Save the numbers for gas, water, and electricity utilities for emergencies.
- Local Red Cross or Disaster Relief Organizations: Be aware of organizations that provide assistance during disasters.
- Animal Control: Have the contact information for local animal control services.
- Roadside Assistance: If you drive, keep the contact information for roadside assistance services.
- Community Services: Know about local community services that might assist in non-medical emergencies.
- Neighbors and Community Contacts: Establish communication with neighbors and community members for mutual assistance.

Activities

Activity 1: Visit a nearby hospital and observe the medication chart of the patient i.e. the Doctor Order Sheet. Fill the table given below with the

Components identified in the medication chart of the patient:

Components to be observed	Component present in the Medication Chart

Check Your Progress

A. Match the following

	A		B
1	Right Patient	a	Check the clear label
2	Right medicine	b	Identify the person
3	The right time	c	Error to be reported if dosage is less or more
4	The right dose	d	30 minutes before or after the time recommended

B. Fill in the Blanks

1. A _____ is any substances that alters the physiological function with a potential for affecting health.
2. Pharmacy is the branch of that focuses on the safe and effective use of medications.
3. A _____ is defined as a substances used to promote health, prevention of illness, diagnose or cure disease.

C. Answer the following questions

1. Define pharmacy?

_____
_____
_____

2. Write the responsibilities of primary drug administration while giving medicine to the patient.

_____
_____
_____

3. What is the importance of seven rights in drug administration?

_____
_____
_____

4. What do you understand by medical and non-medical emergency and what is its importance in present times?

Session 3: Forms and Routes of Medication

Medicines are made in many forms and form any routes. Some medicines come in more than one form. Some can be given with more than one route. Complete medicine orders must state the route and the form that the patient must take.

Enlist following Forms of Medicine

Medicines can come in these forms:

- Tablets
- Capsules (regular and sustained release)
- Elixirs
- Suppositories (vaginal and rectal)
- Oral suspensions
- Syrups
- Tinctures
- Ointments
- Pastes
- Creams
- Drops (eye)
- IV suspensions and solutions
- Metered dose inhalers

Routes

Route scan be:

- Oral
- Buccal (inside cheek)
- Sublingual (under the tongue)
- Topical (on the skin)
- Ophthalmic (eye)
- Otic (ear)
- Vaginal
- Rectal
- Nasal
- Via a Nasogastric or gastrostomy tube
- Inhalation
- Subcutaneous(under skin)
- Intramuscular (in the muscle)
- Intradermal (in the skin)
- Transdermal (through the skin)
- Intravenous (in to the vein)
- Intra Cardiac (in the heart)
- Intra Thecal (introduce in the spinal cord)
- Intra Osseous (in the joint)
- Intra Artrial

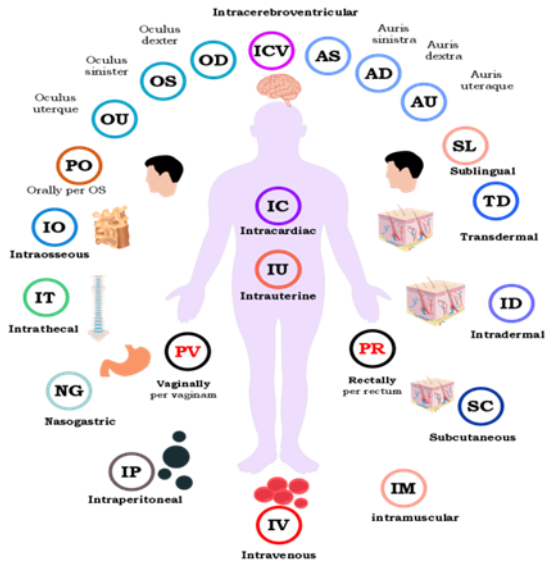

Fig.1.7 Routes of Drug Administration

Complete Orders

A doctor or another person, like a nurse, must write complete and legible order for a medicine before it is given or taken. A complete order must have the:

- Date of the order
- Time of the order
- Name of the medicine
- Dose
- Route
- Form
- Time or frequency that it should be taken
- Signature of the nurse

Labels

All labels must have the:

- Patient name
- Name of the medicine
- Strength of the medicine
- How much to take
- Route
- Form
- Time
- Date of the order
- Date that the bottle or container was filled
- Date that it expires and can no longer be used
- The name of the person who ordered it
- Any special instruction, such as keep out of light and cold place.

Route and Form Considerations

The oral route is the best route for children. When a patient has a problem with swallowing, as many older people have, the following things may be done.

- Crushing: Crushing the pill or opening the capsule and putting it in something like apple sauce can help. Time release capsules, some coated tablets, effervescent tablets, medicines that upset these to mach, bad tasting medicines and sublingual medicines (those placed under the tongue) can NOT be opened or crushed. Check with the supervisor to find out if a medicine can be crushed.
- Liquid form: Using a liquid form of medicine can also help people who have trouble with pills and capsules.

Age Specific Route and Form Considerations

Infants

- Use a syringe, dropper or nipple for oral liquid medicines. Toddler
- Use a spoon or a ounce cup for liquid oral medicines. Preschool and School Age Children.
- Most children in these age groups are able to take capsules and tablets. Adolescents
- Adult dosages, routes and forms of medicines are usually now allowed.

Medicine Routes

A health professional - administration procedure. Below are routes that Health worker can assist with nurse. The following are the common route of drug administration.

Topical (Skin Surface)

Do not use on skin that is not intact unless, of course, the medicine is being used to treat broken skin. The procedure for using this route is:

1. Open the tube.
2. Place the top upside down to keep it clean.
3. Using gloves during medication.
4. Put the medicine on a tongue depressor. Use a cotton tip pad applicator or sterile gauze for the face.
5. Apply it in long strokes going with the direction of the hair growth.

Transdermal

Remove the old patch if there is one.
•Wash the area with soap and water.
•Find a place that has no hair on the person's upper arm or their chest.
•Dry the site.
•Put on gloves (Both the UAP and the patient)
•Put the dose on the patch or strip. Do not let it touch your own skin.
•With the medicine down and against the skin the person should be told to gently move these trip over a 3-inch area to spread it out. Do NOT rub.
•Cover with a plastic wrap or special dressing and tape it in place so that it does not fall off.
•Write the date, time and your initial son the cover.

Oral

- Give the patient the medicine.

- Remain with the patient until the medicine(s)is swallowed.

Buccal and Sublingual

Buccal medicines are placed Sublingual medicines are taken under the back of the tongue.

1. Give the patient the medicine.
2. Tell the person to put the medicine inside their mouth in (buccal) or under their tongue (sublingual) until it dissolves.
3. Tell the patient to leave the drug in its position so that it can be completely dissolved.

Fig.1.8 Metered-dose

Ophthalmic(Eye)

- Use gloves during eye care prevent from infection.
- Help the person to a sitting position or in to a supine position.
- Have the patient tilt their head back?
- Have the patient look up and away?
- Have the person steady their hand against their forehead with the dropper in their other hand.
- Pull down the lower lid.
- Put the number of drops in to the space under the lower eye lid.
- Pull down the lower lid for an eye ointment.
- Tell the person to squeeze the tube so that the medicine is placed on the inside of the lower eyelid, from the inside near the nose to the outer part of the inside of the lid. Do not touch the eye with the tip of the tube.
- Ask the person to now close their eyes. Blinking will spread the drops and rolling the closed eyes will spread the ointment over the eye.
- Clean the excess off with a tissue.

Otic (Ear)

- Warm the ear drops to body temperature.
- Tell the person to lie on their side so that the ear to get the medicine is up.
- Straighten out the ear canal by pulling the ear lobe up and back.
- Tell the person to place the drops against the side of the inner ear as you continue to hold the ear lobe in place until you cannot see any more drops.
- Havethepersonkeeptheirheadtothesideforatleast10minutes. (vii) Inhalation

There are two different types of inhalers that administer medicines with this route. These two types are:

Metered-dose inhalers

The steps for using a metered dose inhaler are:

•Shake the bottle and remove the cap.

•Ask the person to breathe out.

•Have the person then place their lips around the mouthpiece.

•Tell the person to press the bottle against the mouthpiece while the person is inhaling in long, deep and slow way.

•Have the person hold their breath for a couple of seconds and then breathe out slowly.

•Tell the person to rinse their mouth with water and then spit it out. This prevents an infection of the mouth.

Turbo inhalers

- The steps for using a *turbo inhaler* are:
- Slide the sleeve away from the mouthpiece.
- Turn the mouthpiece counter-clockwise in order to unscrew it.
- Put the medicine into the stem of the mouthpiece.
- Rescrew the inhaler.
- Slide the sleeve all the way down to puncture the capsule.
- Tell the person to tilt their head backwards.
- Tell the person to blow out all the air in their lungs.
- Tell the patient to then breathe in deeply and hold it for a couple of seconds while the mouthpiece is in their mouth.
- Repeat steps 7 and 8 until all of the medicine has been used.
- The patient can then rinse their mouth if they like.

Indications for Use

All medicines have special uses. Most of these uses are related to the wanted actions of the medicine. Some uses are related to the medicine's side effects. For example, diphenhydramine, an antihistamine is used for both allergies as well as for sleep because one of its side effects is drowsiness.

Precautions and Contraindications

Some medicines are contraindicated or not allowed to be used for some patients. For example, a medicine can be prohibited for patients that have severe kidney or liver disease and those that are pregnant or breast feeding. Other medicines may only be used with some people when they are used with caution. For example, a medicine can sometimes be used, but only with caution, for an older person. It is very important to closely observe and report the patient's responses to the medicine when it is being used with caution.

The most common contraindication is an allergy or sensitivity to the medicine. The patient's allergies must be known before you assist the person. If you see NKA on the patient's chart, this means that the person has No Known Allergies.

Allergies

A rash and even a life threatening reaction can happen if a medicine is taken by a person that has an allergy to it. *Anaphylaxis* is a very severe allergic reaction that can happen if a person is allergic to a food, like peanuts or shellfish, a substance, like latex, or a medicine like penicillin or cephalosporin. It is a medical emergency that needs immediate attention.

The signs are:
- Itching
- Hives
- Swelling of the throat
- Trouble breathing (dyspnea)
- Shortness of breath
- A drop in blood pressure
- Irregular heart rhythm
- Nausea
- Vomiting
- Abdominal cramping
- Loss of consciousness
- Death

Interactions
Medicines can interact with:
- Other medicines
- Some foods
- Some herbs
- Lifestyle (alcohol, etc)

Information about drug-drug, drug-food, drug-herb, drug-lifestyle interactions can be found in a drug reference book like the Physicians' Desk Reference (PDR) for every medicine.

Side Effects and Adverse Reactions

All medicines have side effects. Nausea and vomiting are the most common side effects. Some **side effects** are troublesome; others can be life threatening. **Adverse drug reactions** are serious and they can also lead to death.

Some medicines also have **toxic effects**. For example, tinnitus is a sign of toxicity with aspirin.

You must know about the side effects, adverse drug reactions and the toxic effects of all medicines your patients are taking. You must observe such allergic reactions and report them.

Doses

All medicines have special dosages and/or dosage ranges for adults and children patients.

Some adult dosages may be lowered for the old person because the normal changes of the aging process make this age group more prone to side effects, adverse drug reactions, toxicity and an over dose. Children get medicine with a

dose that is based on how much they weigh.

Abbreviations

Abbreviations save time, but, they can also lead to deadly effects. Some of the abbreviations that we have been using for many, years are now being stopped because they have led to serious errors.

The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) has issued guidelines and rules for using abbreviations, acronyms and symbols.

Hospitals, nursing homes, assisted living facilities, and all other healthcare settings must now standardize abbreviations, acronyms and symbols that they are using. They must also make a list of all that they will not use.

Commonly used and acceptable abbreviations along with their full form meaning are as follows.

Abbreviation	Meaning	Abbreviation	Meaning
a.c.	Before meals	**MEq**	Mill equivalent
adlib	Freely	**Min**	Minute
a.m.	Morning	**Mg**	Milligram
ASA	Aspirin	**ML**	Milliliter
b.i.d	Twice a day	**NPM**	Nothing by mouth
BM	Bowel movement	**NTG**	Nitroglycerin
BP	Blood pressure	**p.c.**	After meals
BS	Blood sugar	**p.m.**	Evening
C-with line over	With	**p.o.**	By mouth
Cap	Capsule	**Prn**	When needed
Cc	Cubic centimeter	**Q**	Every
discorD.C.	Discontinue	**Qh**	Every hour
disp.	Dispense	**Qid**	Four times a day
elix.	Elixir	**SOB**	Shortness of breath
Ext	Extract	**Sol**	Solution
florfld	Fluid	**ss.**	One half
g.orGm.org	Gram	**Stat**	Immediately
Gr	Grain	**susp.**	Suspension

Activities

Activity 1:- Visit a nearby hospital and identify the suitable routes and form of drug administration for the children in given age group. Fill the table given below with the suitable routes and form of drug:

Age group	Form of drug	Routes of drug
Infant		

Toddler		
Adolescent		
Adult		
Elderly		

Activity 2:- Visit a nearby hospital and observe the medication chart. Identify the meaning of standard abbreviation used in the medication chart. Fill the table given below with the full form or meaning of the abbreviation:

ABBREVIATION	MEANING
a.c.	
a.m.	
b.i.d	
Cap	
NPO	
p.c.	
p.o.	

Check Your Progress

A. Multiple Choice Questions

1. Identify the one which does not represent the form of medicine:
a) Tablet
b) Nasal
c) Syrup
d) Ointment

2. A complete order must have which of the following information:
a) Patient name
b) Name of the medicine
c) Strength of the medicine
d) All of these

B. Match the following

	Abbreviation		Meaning
1	Qh	a	Immediately
2	Qid	b	Shortness of breath
3	SOB	c	Solution
4	Sol	d	One half
5	ss.	e	Four times a day
6	Stat	f	Every hour

C. Fill in the blanks

1. _____ is a very severe allergic reaction that can happen if a person is allergic to a food.
2. _____and _____are the most common side effects.

3. NKA on the patient chart indicates _____.

D. Answer the following questions

1. List different forms of medicine

_____
_____
_____

2. List any three characteristics of complete order?

_____
_____
_____

3. State the parameters indicated on the label of medicine.

_____
_____
_____

4. What is drug administration and list the medicine routes.

_____
_____
_____

E. Mentioned whether the following statements are True or False.

1. Topical medicines should not be used on skin that is not intact unless mentioned.
2. Buccal medicines are placed under the back of the tongue.

Session 4: Classification of Drugs

Medicine Groups (Classification)

Medicines can be grouped according to their use or function, or the system that they treat or their chemical makeup. For example, they can be grouped according to a body system like this:

- Respiratory medicines
- Cardiac medicines
- Nervous system medicines

They can also be grouped according to their function or use:

- Non steroid anti-inflammatory medicines (NSAIDs)
- Narcotic analgesics
- Antidepressants

Lastly they can be grouped according to their chemical makeup:

- Amino glycosides
- Estrogens
- Opioids

Most of the medicines within a group are quite alike but they are not identical. Grouping helps us to see the things that are the same and the things that are

different. One of the best ways to learn about a large number of medicines is to learn about groups first. You will learn about some common groups later in this class.

Classification of Drugs

The following are the major categories of drugs:

1. Antacids

Uses: Gastritis, peptic ulcer, hiatal hernia and reflux esophagitis.
Adverse Reactions and Side Effects: Constipation, diarrhea, flatus, abdominal distention, alkaluria (urine that is not normal and has a high base pH).

Contraindications: Allergy and sensitivity

Implications: Check for stomach pain, GI symptoms and kidney problems.

Examples of Medicines in this Group:
- Aluminum carbonate
- Calcium carbonate

2. Anticoagulants
Uses: Heart attack (MI), pulmonary embolus (lung clots), deep vein thrombosis, disseminated intravascular clotting syndrome (DIC), and atrial fibrillation. It is also used with kidney dialysis.

Adverse Reactions and Side Effects: Hemorrhage, diarrhea, fever, rash and blood disorders depending on the drug.

Contraindications: Bleeding disorders, (hemophilia and leukemia), ulcers, blood problems, nephritis (kidney infection), and endocarditis (infection of the inner part of the heart).

Fig.1.9 Medicine Groups

Implications: Observe for bleeding (like blood in the mouth, blood when the person shaves, black stools, stool occult blood, ecchymosis (black and blue marks), etc. Check the BP. It could be too high.

Examples of Medicines in this Group:
- Warfarin sodium
- Heparin

3. Anticonvulsants
Uses: They prevent seizures.

Adverse Reactions and Side Effects: Depressed bone marrow, which can be life-threatening, GI problems, confusion, lack of balance and slurring of speech.
Contraindications: Allergy

Implications: Observe liver and kidney function, blood, mental state, and for toxicity (ataxia, bone marrow depression, nausea, vomiting, cardiovascular problems, Stevens-Johnson syndrome)

Examples of Medicines in this Group:
• Phenytoin
• Diazepam

4. Antidepressants
Uses: Depression, Bed wetting for children.

Adverse Reactions and Side Effects: Orthostatic hypotension, mouth dryness, dizziness, drowsiness, urine retention, high blood pressure, kidney failure and paralytic ileus.

Contraindications: Large prostate, seizures, kidney, liver and heart disease.

Implications: Take the BP both standing and lying. Check the mental state. Observe for unusual facial symptoms and urine retention.

Examples of Medicines in this Group:
• sertraline
• amitriptylyline
• bupropion
• phenelzine

Examples of Medicines in this Group:
• sertraline
• amitriptylyline
• bupropion
• phenelzine

5. Antidiabetic Medicines
Uses: Diabetes and ketoacidosis

Adverse Reactions and Side Effects: Hypoglycemia (low blood pressure) and liver damage.

Contraindications: Oral agents are contraindicated for juvenile diabetes and ketoacidosis.

Implications: Check the blood glucose and check for signs of high and low blood sugar.

Examples of Medicines in this Group:

- Insulin
- Glyburide

6. Antidiarrheals
Uses: Diarrhea

Adverse Reactions and Side Effects: Constipation, paralytic ileus, and stomach pain.

Contraindications: Colitis

Implications: Used for short term therapy (48 hours or less). Check the bowel response.
Examples of Medicines in this Group:
- bismuth subgallate
- kaolin and pectin mixtures

7. Antifungals
Uses: Fungus infections

Adverse Reactions and Side Effects: Kidney, liver damage, GI problems, hypokalemia (low potassium), anorexia (lack of appetite), nausea and vomiting.

Contraindications: Depressed bone marrow.

Implications: Check the vital signs, I & O, blood, weight, hearing, kidney and liver function.

Examples of Medicines in this Group:
- nystatin
- amphoteracin B

8. Antihistamines
Uses: Allergies.

Adverse Reactions and Side Effects: Most can cause drowsiness, headache, urinary retention, blood problems, thick bronchial secretions and GI effects

Contraindications: Asthma, peptic ulcer, narrow angle glaucoma.

Implications: Check the urinary, respiratory and cardiac status.

Examples of Medicines in this Group:
- Diphenhydramine hydrochloride
- Chlorpheniramine maleate

9. Anti-Infectives
Uses: Infections
Adverse Reactions and Side Effects: Diarrhea, nausea, vomiting, bone marrow depression and anaphylaxis (life threatening)

Contraindications: Most people allergic to penicillin are also allergic to the cephalosporins.

Implications: Observe bowel pattern and urinary output. Check the kidney

function, and for signs of another infection and bleeding.

Examples of Medicines in this Group:
- Penicillin
- Tetracycline

10. Antineoplastics
Uses: Cancer

Adverse Reactions and Side Effects: Nausea, vomiting, hair loss, liver damage, and heart damage.

Contraindications: Liver and kidney damage.
Implications: Check kidney and liver function, I & O. Observe for bleeding, jaundice (yellow skin and yellow eyes), dependent edema, and breaks in the skin.

Examples of Medicines in this Group:
- Fluorouracil
- Cisplatin

11. AntiparkinsonAgents

Uses: Parkinson's disease

Adverse Reactions and Side Effects: Involuntary movement, insomnia, nausea, vomiting, orthostatic hypotension, dry mouth, numbness and headache

Contraindications: Narrow angle glaucoma

Implications: Check the respirations, blood pressure and changes in mental and behavioral states.

Examples of Medicines in this Group:
- Levodopa
- Entacapone

12. Antipsychotic and Neuroleptic Agents
Uses: Psychosis and anxiety. They are also sometimes used for unrelieved hiccups, nausea, vomiting, and pediatric behavior problems as well as relaxation before surgery.

Adverse Reactions and Side Effects: Some symptoms with antiparkinsonian medicines. Some side effects include dry mouth, photosensitivity (sensitive to light), hypotension (low blood pressure) and life threatening cardiac problems and breathing problems (laryngospasm).

Contraindications: Heart disease, high blood pressure, severe bone marrow depression, blood disorders, Parkinson's disease, narrow angle glaucoma and children less than 12 years of age. Cautions use with the elderly.

Implications: Check the I & O, blood pressure lying and standing (orthostatic hypotension), EPS (antiparkinsonian agents should be used for this). Observe for dizziness, palpations, tachycardia (fast heart rate), changes in emotion, level of consciousness, as well as for any walking and sleep problems.

Examples of Medicines in this Group:
- haloperidol
- chlorpromazine

13. Antitubercular Medicines
Uses: Tuberculosis

Adverse Reactions and Side Effects: Anorexia, nausea, vomiting, rash, kidney, liver and hearing effects, which could be severe.

Contraindications: Kidney disease. Caution with liver disease, pregnancy and lactation

Implications: Check kidney and liver status and for signs of anemia.

Examples of Medicines in this Group:
- isoniazid

14. Cough Medicines & Expectorants
Uses: The expectorants are used for a cough from bronchitis, TB, pneumonia, cystic fibrosis and COPD. Antitussives are used for coughs that are not producing mucus.

Adverse Reactions and Side Effects: Dizziness, drowsiness and nausea

Contraindications: Iodine sensitivity, pregnancy, lactation and an over active thyroid. Caution with the old people and those with asthma

Implications: Check the cough and the sputum. Increase fluid intake and humidity to keep the mucus thin.

Examples of Medicines in this Group:
- Guaifenesin
- Codeine

15. Antivirals
Uses: Infections caused by a virus like HIV, herpes and varicella.

Adverse Reactions and Side Effects: Nausea, vomiting, diarrhea, headache, lack of appetite, blood problems, and kidney failure

Contraindications: People with an abnormal immune system, like AIDS, and those with herpes. Caution with pregnancy, lactation, kidney and liver disease and dehydration

Implications: Check for kidney and liver problems. Observe for signs of infection and allergic reactions (itching, rash).

Examples of Medicines in this Group:
- Acyclovir sodium
- Cidofovir

16. Barbiturates
Uses: Epilepsy, sedation, insomnia, anesthesia, and gall stones

Adverse Reactions and Side Effects: Drowsiness, nausea, blood problems and Stevens-Johnson syndrome

Contraindications: Allergy, poor liver function and pregnancy. Caution with the elderly and those that have kidney or liver disease

Implications: Observe seizure control and for signs of toxicity (insomnia, hallucinations, hypotension, pulmonary constriction; cold, clammy skin; blue or gray lips, vomiting, delirium, weakness)

Examples of Medicines in this Group:
- Phenobarbital
- Secobarbital

17. Benzodiazepines

Uses: Anxiety, acute alcohol withdrawal and pre-operative relaxation.

Adverse Reactions and Side Effects: Physical dependence and abuse, dizziness, drowsiness, orthostatic hypotension, and blurred vision

Contraindications: Narrow angle glaucoma, infants less than 6 months old. Caution with the elderly as well as with those that have kidney and/or liver disease

Implications: Check the lying and standing blood pressure (report it if it drops 20 mm Hg or more), pulse, liver and kidney function and signs of dependency. Give the person milk or food to prevent GI symptoms.

Examples of Medicines in this Group:
- Diazepam
- Clonazepam

18. Bronchodilators

Uses: Asthma, spasm of the bronchi, COPD, and Cheyne-Stokes respirations

Adverse Reactions and Side Effects: Dyspnea (trouble breathing), bronchospasm, anxiety, tremors, throat irritation, nausea and vomiting.

Contraindications: Narrow angle glaucoma, severe heart disease, and a fast heart rate. Cautious use with hypertension, seizures, pregnancy and lactation, an over active thyroid and a large prostate

Implications: Check for response (absence of dyspnea and/or wheezing)

Examples of Medicines in this Group:
- Albuterol
- Aminophylline

19. Diuretics

Uses: High blood pressure (hypertension) and edema

Adverse Reactions and Side Effects: Low potassium (hypokalemia), high blood glucose (hyperglycemia) blood problems, like anemia, and dehydration

Contraindications: Electrolyte imbalances, poor urine output and dehydration. Caution among the elderly as well as when the person has a kidney or liver disease

Implications: Potassium in the form of a tablet or liquid may be needed. A banana also gives the person potassium, Check the lying and standing blood pressures. This medicine should be given in the morning so that the person does not have to get up in the middle of the night to void.

Examples of Medicines in this Group:
• Furosemide
• Hydrochlorothiazide

20. Histamine H2 Antagonists
Uses: Ulcers and GI reflux disease

Adverse Reactions and Side Effects: Blood problems, diarrhea and headache.

Contraindications: Cautious use with children less than 16 years of age, and with those people that have liver or kidney disease, and organic brain syndrome. Caution is also indicated during pregnancy and if the person is breast feeding a baby.

Implications: Check the I & O. Give it to the person during their meal so that it will take its full effect.
Examples of Medicines in this Group:
• Cimetidine
• Ranitidine

21. Immunosuppressants
Uses: Prevention of organ transplant rejection

Adverse Reactions and Side Effects: Protein, blood and albumin in the urine, Kidney failure, liver damage, oral thrush, sore gums, fever and headache.

Contraindications: Caution with severe liver or kidney disease and pregnancy

Implications: Check for liver and kidney function. Signs of liver damage are itching, light colored stools, jaundice and dark urine. Give the person this medicine with a meal.

Examples of Medicines in this Group:
• cyclosporine
• azathioprine

22. Laxatives
Uses: Constipation, as bowel prep and a stool softener

Adverse Reactions and Side Effects: Cramping, diarrhea, and nausea

Contraindications: Large colon, stomach pain, nausea, vomiting, impaction, GI obstruction, gastric retention and colitis. Caution must be used if the person has hemorrhoids and/or rectal bleeding

Implications: Check the I & O. The person must take this with water only. The

person should not take it within one hour after taking milk, a meal or an antacid.

Examples of Medicines in this Group:
• psyllium
• docusate sodium

23. Nonsteroidal Anti-Inflammatories
Uses: Mild to moderate pain, arthritis and dysmenorrhea

Adverse Reactions and Side Effects: Blood problems, kidney problems, blood in the urine, painful urination, stomach pain, lack of appetite, anorexia, dizziness and drowsiness.

Contraindications: Asthma, severe liver and/or kidney disease. Cautions use with the elderly, children, lactation, pregnancy and for patients with GI, cardiac and/or bleeding problems.

Implications: Check the blood, kidney and liver function. Baseline hearing and eye exams are recommended so that changes can be seen. Toxicity can lead to tinnitus (ringing in the ears) and/or blurred vision.

Examples of Medicines in this Group:
• ibuprofen
• naproxen

24. Opioid Analgesics
Uses: Moderate to severe pain
Adverse Reactions and Side Effects: GI problems (constipation, nausea, vomiting, anorexia, cramps), sedation, slow breathing, circulatory depression and increased pressure in the head

Contraindications: Upper airway obstruction, bronchial asthma, and addiction. Cautious use with kidney, liver, respiratory and heart disease.

Implications: Check the respiratory, urinary and mental status, including the person's level of consciousness. An antiemetic can be used for nausea and vomiting. Continue to check the level of pain

Examples of Medicines in this Group:
• Codeine

25. Salicylates

Uses: Mild to moderate pain, inflammation (arthritis), and for a fever

Adverse Reactions and Side Effects: Rash, GI symptoms, liver and blood problems, and hearing problems (tinnitus- a sign of possible toxicity)

Contraindications: Frequently occurring contraindicated with a vitamin K deficiency, GI bleeding, a bleeding disorder, and children with Reye's syndrome. Caution with Hodgkin's disease, liver and kidney failure, anemia

Implications: Look for signs of a liver problem (clay colored stool, dark urine, diarrhea, yellow sclera and skin, itching, fever, abdominal pain) and ototoxicity (ringing or roaring in the ears, tinnitus)

Examples of Medicines in this Group:
- aspirin
- salsalate

26. Thyroid Medicines

Uses: Under active thyroid gland

Adverse Reactions and Side Effects: Palpitations, tachycardia, insomnia, tremors, angina, weight loss, irregular heartbeat, and thyroid storm.

Contraindications: Heart attack, and poor adrenal function. Cautious use with the elderly, pregnant and breast feeding women, and for patients with diabetes, high blood pressure, angina, and other heart disease

Implications: The person should take it at the same time every day. Check the blood pressure before each dose. Check the I & O, weight, and for irritability and nervousness

Examples of Medicines in this Group:

- Thyroid
- levothyr

Activities

Activity 1: Visit a nearby hospital and fill the table given below with the examples of particular drug category:

DrugCategory	Uses	Contraindications	Implications	Examples of medicines
Antipyrectics				
Analgesics				
Diuretics				
Anticoagulants				
Anticonvulsant				
Bronchodilators				

Check Your Progress

A. Fill in the Blanks

1. _____ are used as stool softener in constipation.
2. The drugs used for controlling blood pressure are _____.
3. One of the common side effect of antidiarrheal medicine is _____.

B. Short Answer Questions:

1. What is Salicylates?

_____
_____
_____
_____
_____

2. What is the use of antacid?

_____
_____
_____
_____
_____

3. What are the common side effects of anti-psychotic?

_____
_____
_____
_____
_____

4. Classify medicine groups.

_____
_____
_____
_____
_____

Module 2	Maintain a Safe Healthy and Secure Working

Introduction

In this Chapter, you will learn about the various facilities, equipment, and materials used for First Aid. First Aid facilities should be located at points convenient to workers.

First Aid is the first assistance or aid or treatment given to a patient in emergency situation before the formal and appropriate medical help is available. Any trained person, paramedical staff at any point of time can give their services. An ambulance should also be made available at the workplace to meet any emergency. The very purpose of giving first aid is to prevent further deterioration of the patient. The responsibilities of the first aid giver are to help the patient by winning the confidence of the patient. At the same time first aider must not endanger his own life while giving appropriate and adequate treatment bearing in the mind that casualty may have more than one injury.

When a person suffers any kind of injury or sudden illness, any immediate medical attention or treatment may be provided to reduce the discomfort, pain and deterioration of the condition. During these situations trained doctors are not available on the spot. Hence the first care provided before seeking professional medical help is called “First Aid”. As a trained GDA it is necessary to understand the principles and procedures for providing first aid while awaiting the arrival of “Medical Aid

This unit guides you by describing the principles and rules of first aid, identifying facilities, equipment and materials for first aid and performing the role of first aider in fever, heat strokes, back pain, asthma and food borne illness.

Learning Outcomes

After completing this module, you will be able to:

- Explain the basics of first aid principles and purpose of First Aid
- Knowledge to perform basic life support (BLS) as and when required.
- Explain the use of protective devices such as restraints and safety devices.
- Discuss the hospital emergency codes During emergency and disaster management techniques to deal with institutional emergencies.
- Knowledge of dealing with common ailments and injury condition

- Discuss about the escalation matrix for referral and management of common emergencies.

Module Structure

Session 1: Safety, Emergency Medical Response and First Aid

Session 2: Performing the Role of Tele Health Care Service Coordinator in Fever, Heat, Stroke, Back Pain, Asthma and food Born Illness

Session 3: Immunization

Session 4: Personal Hygiene Practices for Tele Health Services Coordinator

Session 5: Maintain Safe, Healthy and Secure Environment

Session 1: Safety, Emergency Medical Response and First Aid

In this session, you will learn about the principles and rules of first aid. This session explains the purpose, principles and general rules of basic First Aid. First Aid means initiating treatment for life support of people suffering with an injury or sudden illness. We have to understand that First Aid has its limitations and cannot be substituted for professional medical treatment. Proper assistance given by First Aider helps in saving the life of a patient. The ISO specified symbol for the First Aid is symmetrical white cross on a green background.

Fig.2.1 Well arrange

Purpose of First Aid

The primary intention for giving first aid is to sustain the life of the victim before the arrival of a qualified medical expert, reduce discomfort due to pain, help in early recovery and prevent condition from worsening.

Fig. 2.2 first aid symbol

Principles of First Aid

The basic principles of first aid are to:

1. **Preserve life**: This includes preserving the life of the casualty and rescuer.
2. **Ensure protection of the casualty from further harm**: The place should be safe and not affected by the presence of excess people.
3. **Provide pain relief**: This includes the use of ice packs or applying a sling.
4. **Prevent the condition from becoming worse**: Ensure the First Aid procedures does worsen the condition.

Rules of First Aid

Important rules for First Aid are as follows:

- **Check**: Find out what has happened, and then what is wrong with the person. Comfort the victim and arrange shelter.
- **Call**: Arrange for professional medical aid.
- **Care**: Help the victim, preferably without moving him or her.

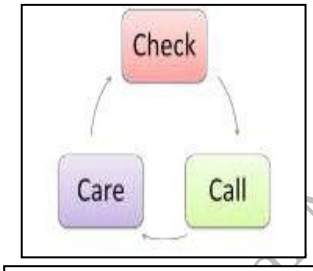

Fig. 2.3 Rules of First

Health Emergency

A situation in which the health of a person is in danger because of sudden illness or accident, and immediate help is required to "save a life" is health emergency. The ill or injured person should be given immediate attention and first aid in case of emergency before the medical help arrives. The various situations which requires immediate medical care are: (i) electric shock, (ii) breathing difficulty (iii) burns, (iv) bleeding, (iv) injury, (v) fracture, (vi) heart attack, etc.

The Human Body

The human body works together continuously to perform countless tasks. The body by adulthood consists of close to 100 trillion cells, the basic unit of life. These cells are organized in systematic manner to form the whole body with various body systems. A newborn baby has over 300 bones at birth, whereas an adult human has 206 bones. The body includes the musculoskeletal system, cardiovascular system, digestive system, endocrine system, integumentary system, urinary system, lymphatic system, immune system, respiratory system, and reproductive system. We will now understand two vital aspects of life from the point of First Aid.

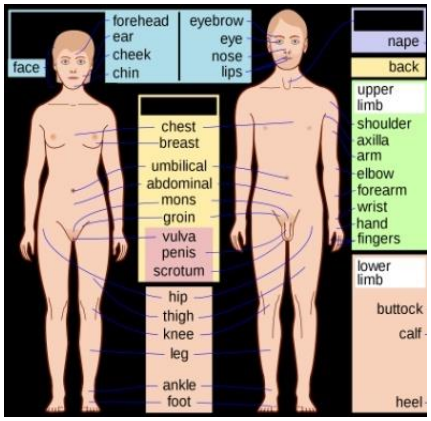

Fig. 2.4 Human body

Breathing

Breathing is vital to life and a person breathes about 20,000 times a day. Breathing process is assisted with the help of the respiratory system, which includes the nose, throat, voice box, windpipe, and lungs. We inhale air through the nose or mouth that meets together at the pharynx or throat, located at the back of the nose and mouth.

The diaphragm that separates the chest from the abdomen moves up and down when we inhale and exhale.

When we breathe in, the diaphragm moves down to enlarge the chest cavity to fill in maximum air. When we breathe out or exhale, the diaphragm moves up, forcing the chest cavity to push the gases in the lungs out through the nose and mouth.

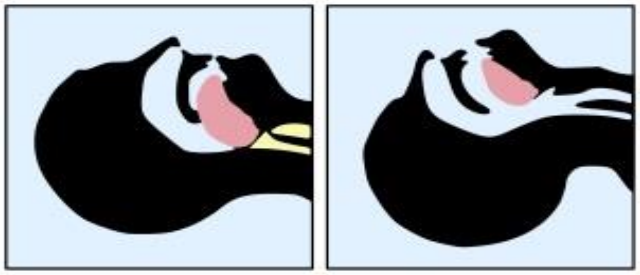

Fig.2.5: First aid for Breathing problem
In case of tongue fallen backwards, blocking the airway, it is necessary to hyperextend the head and pull up the chin, so that the tongue lifts and clears the airway.

Blood circulation

Blood is composed of plasma and cells suspended in viscous medium. The blood consists of plasma, red blood cells, white blood cells and platelets. The heart, the main pumping organ of the circulatory system is made of muscles. It is located between the two lungs slightly inclined towards the left side. The pointed tip at the bottom of the heart touches the front wall of the chest each time the heart beats producing a sound . You can also listen to them with your ear. While the heart contracts, it pushes the blood out into two major loops or cycles, the systemic loop or the pulmonary loop.

The blood reaches the body's systems by circulating oxygen to all its organs,

structures and tissues and collecting carbon dioxide waste through the systemic cycle. The pulmonary loop helps in oxygenation of blood. It circulates blood to and from the lungs, to release the carbon dioxide and pick up oxygen. The systemic cycle controls the left side of the heart and the pulmonary cycle the right side of the heart.

General Considerations and Rules

The elementary lifesaving procedures are head tilt, First Aid at choking and recovery position. Now let us imagine that a person has met with an accident. The services of priority that should be followed by the first aider in an emergency are as follows:

Step 1: Check for bleeding: Stop bleeding by applying direct pressure on the wound site.

Step 2: Check for head, neck and spinal injury: If any of these are suspected, immobilize the victim to prevent further injury. Moving a victim will often increase the impact of spinal injuries.

Step 3: Determine responsiveness: If a person is unconscious, try to arouse by gently shaking and speaking.

Fig. 2.6 *Basic life*

Do not give fluid, the victim cannot swallow and could suffocate. Look for the victim's chest movements and listen for sounds of breathing (place your ear near the nose and mouth and feel for breath on your cheek). If the victim is not breathing then mouth to mouth resuscitation is to be given. If you are not trained to do that, then call for medical help at the earliest.

If the victim is breathing, but unconscious, roll the casualty on one side, keeping the head and neck aligned with the body. This will help drain the mouth and prevent the tongue or vomit from blocking the airway if the person remains unresponsive, carefully roll the casualty on back and open the airway.

- Keep head and neck aligned.
- Cautiously roll onto the back while holding the head.

- Open the airway by lifting the chin.

Fig. 2.7: CPR first aid

Observe ABC as follows:
A – Airway
B – Breathing
C – Circulation

Airway: Ensure that the tongue or any foreign body does not obstruct the airway.

Breathing: Make sure the victim is breathing. If you are trained to give mouth to mouth respiration, then facilitate breathing.

Circulation: Check for the pulse to ensure that the heart is beating properly. Check heart beat/pulse of the victim. If there is no pulse and if you are trained to do Cardio Pulmonary Resuscitation (CPR), then begin CPR immediately.
(**Note**: CPR is administered when both heart and lungs have ceased to function)

Step 4: Call Emergency Services: Call for help or tell someone else to call for help as soon as possible. If you are alone, try to establish breathing before calling for help, and do not leave the victim unattended for an extensive amount of time. Stay calm and don't give up. Continue to aid the victim until medical help arrives.

Heimlich maneuver
The Heimlich maneuver, named after Dr. Henry Heimlich, is an emergency procedure used to treat choking caused by airway obstruction and is also known as abdominal thrust, is a first aid procedure used to treat conscious persons who are suffocating due to an obstruction. There are some steps for the Heimlich maneuver and how to act in an emergency.

Steps:
Assess the situation: Determine if the person is truly choking, if they are unable to speak, cough, or breathe, and they are clutching their throat they probably need help.

Position yourself: Stand behind and slightly to the side of the person who is choking. Make sure they are standing or sitting straight.

Wrap your arms around the person: Reach around the person's waist. For a child or infant, you may need to kneel or bend.

Make a fist with one hand: Place the thumb of your fist on the person's abdomen, just above the navel and below the ribs.

Hold the fist with your other hand: Use your other hand to hold your fist.

Stomach thrust: Quickly and forcefully push your fist inward and upward into the person's abdomen. Each thrust should be a separate and specific motion with the goal of clearing the blockage.

Continue abdominal thrusts: Repeat abdominal thrusts until the obstruction is gone or the person becomes unconscious. If the person becomes unconscious, follow CPR protocol.

Fig. 2.8 *Heimlich maneuver for Conscious Airway Obstruction*

Check the airway: After the object is removed, check the person's mouth and remove any remaining debris if possible. Be careful not to push the object further down the throat. Call medical emergency.

Activities

Activity 1: - Visit a hospital and find out first aid measures adopted. In your school find out the steps taken by the administration to provide first aid during health/medical emergency.

Activity 2: - Demonstrate CPR procedures in your school.

Check Your Progress

A. Fill in the Blanks

1. The ISO specified symbol for the first aid is _____ on a green background.
2. Blood is a viscous fluid composed of _____.
3. A person breathes about _____ times a day.

B. Short Answer Questions.

1. What is the purpose of First Aid?
2. State the principles of First Aid.
3. What is a Health Emergency? Describe various emergency situations?
4. Explain the Rules of First Aid.
5. What is Heimlich maneuver?

Session 2 - Performing the Role of Telehealth care service coordinator in Fever, Heat, Stroke, Back Pain, Asthma, and Food Born Illness

This session will make you understand about the role of first aider in handling persons who suffered heat stroke, back pain, asthma and food borne illness. A First Aider is a person who undertakes an emergency situation and gives first aid. Often the first aider at an emergency scene is passerby who is willing to help. A parent who help his/her child, a firefighter attending to an injured pedestrian, or an employee who provides care are all providing first aid. A First Aider do not diagnose or treat injuries and illnesses but offers help to the person in need.

Fig. 2.8 Care of patient

This session describes how to give first aid to a casualty with fever, heat stroke, back pain, asthma and food borne illness. As a First Aider, the first thing is to manage the situation and stay in charge until the arrival of the medical help or ambulance. While in charge, many other people may offer to help and crowd the place. In an emergency, where there is a confusion and fear, a well-trained and effective First Aider reassure everyone, and can make the whole experience less traumatic. Besides giving First Aid, one should ensure the following:

- Manage unnecessary crowd.
- Protect the casualty's belongings

Let us now learn about the basic first aid practices that may be utilized by the first aider to provide first aid to people working in various occupations, with special reference to the health sector. Considering your age and body strength, we will take up only those first aid practices that you can easily perform.

Fever

Fever is higher-than-normal human body temperature (normal body temperature is 37^0 Celsius or 98.6^0Fahrenheit). Body temperature is a good indicator of your health. Fever is a symptom and not disease. Fever can be categorized as given below:

- Low fever: 98.8^0F to 100.8^0 F
- Mild to moderate: 101^0 F to 103^0 F
- High fever: 104^0 F and above. If the temperature is high, then it is a sign that body is fighting illness.

Fig. 2.9 Fever

Causes: Fever may be caused due to hot weather, bacterial or viral infection, spending too much time under the sun or allergy to medication or food/water.

Symptom: Symptoms may include hot flushed face, nausea, vomiting, head and body ache, constipation, diarrhea.

First Aid: Monitor temperature using a digital thermometer. Remove the excess clothing. Keep the person in a cool place and if required give a sponge bath in tap water. Give plenty of fluids and prescribed dose of tablet paracetamol.

Taking body temperature

In case of fever, the body temperature is measured using a thermometer. Let us now learn how to take body temperature.

Step 1– Prepare: Wash the tip of the digital thermometer with clean water and wipe it with a clean cloth. Wipe it with a paper tissue after cleaning the surface. This will remove certain germs on the surface.

Step 2– Switch On: Check the power button by switching the button on the digital thermometer to ensure it is working properly. The LCD screen should read "0". If the screen remains blank, replace the battery. Read the instructions given in the manual to replace the battery. Use the thermometer when the initial reading is correct.

Step 3– Position: Place the thermometer in the mouth of the person by laying the tip on a middle point at the back of the tongue before asking the patient to close the lips around it to hold the length of it.

Step 4– Take Temperature: Press the button to make the appliance read the temperature. This can take few seconds to a few minutes. Remove the thermometer from the mouth and read the temperature.

Step 5– Store: After you have finished using the thermometer, switch off the thermometer and clean the tip with water and wipe with tissue paper or dry cloth. Keep the thermometer in its protective case and store it at safe place, away from the reach of children.

Heat Stroke

Heat stroke is a severe heat-related condition. It could be life threatening. It is caused when the body's cooling mechanism fails due to excessive heat and humidity. Impairment in sweat gland function may be another cause of heat stroke.

Symptoms: Body temperature greater than 104^{0}F. Fever may cause headache, dizziness, fatigue, fluctuating blood pressure and irritability.

First Aid: Shift the person to a shady place. Cool the

person by sponging with wet towel. Apply ice packs in armpits and groin. Give luke warm water with electrolyte.

Fig. 2.10: Heat stroke dehydration

Back Pain

Back pain is a short-term acute pain in the back of the body. It indicates that the body is under stress. It is caused due to problems in bones, ligaments and muscles of spine and nerves.

Triggering Factors: Back pain may be aggravated due to poor posture, inappropriate footwear, incorrect walking habits, prolonged sitting, sleeping on soft mattresses,
kidney, bladder prostate disorders, constipation, stress, etc.

First Aid: Massage with hot/cold packs and use painkillers or relaxants for pain relief.

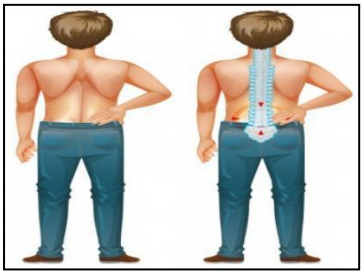

Fig. 2.11 Back Pain

Asthma

Asthma is a chronic inflammatory lung disease that causes airways to tighten and narrow. It creates narrowing of air passages of the lung and therefore produces difficulty in breathing.

Symptoms: Symptoms may include wheezing, cough and cold, tightness in the chest, sticky mucus, disturbed sleep, and breathlessness.
Causes: It is believed that heredity factors are the main cause of asthma. Environmental factors like dust, mite, pollen and occupational exposure to irritants aggravate asthma. Cold, viruses, cigarette smoking, scent, pollution,

change in weather, etc. are the triggering factors.

First Aid: In case of asthmatic attack, use asthma inhalers. Asthma inhalers are hand-held portable devices that deliver medication to the lungs. Asthma inhalers are available to help control asthma symptoms in adults and children.

Fig. 2.12: Asthma

Food Borne Illness

Food borne illnesses occur by eating unhygienic food and water. Bacteria are the common cause of food contamination.

Symptoms: Common symptoms include diarrhoea, which may be bloody, nausea, abdominal cramps, vomiting, fever, dehydration, shallow breath, rapid pulse, pale skin, and chest pain.

First Aid: Oral Rehydration Salt (ORS) should be given with luke warm water. In severe cases, the patient needs hospitalization immediately. Recipe for making a 1 litre ORS solution using Sugar, Salt and Water.

- Clean Water - 1 liter - 5 cupfuls (each cup about 200 ml.)
- Sugar - Six level teaspoons
- Salt - Half level teaspoon
- Stir the mixture till the sugar dissolves.

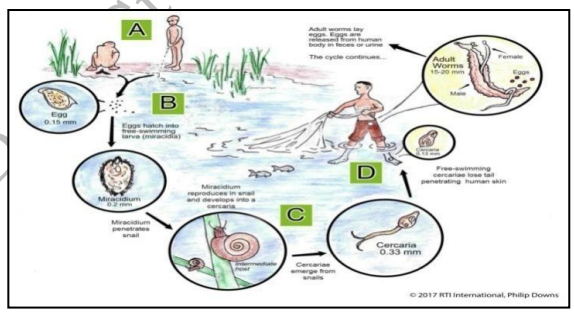

Fig. 2.13 *cycle of contaminated water food born*

INSECT BITE

Signs and symptoms of an insect bite result from the injection of venom or other substances into your skin. The venom causes pain and sometimes triggers an allergic reaction. The severity of the reaction depends on your sensitivity to the insect venom or substance and whether you've been stung or bitten more than once. Most reactions to insect bites are mild, causing a little more than an annoying itching or stinging sensation and mild swelling that disappear within a day or so. A delayed reaction may cause fever, hives, painful joints and swollen glands. You might experience both the immediate and the delayed reactions from the same insect bite or sting. Only a small percentage of people develop severe

reactions (anaphylaxis) to insect venom.

Harmful insects: Bites from bees, wasps, hornets, yellow jackets and fire ants are typically the most troublesome. Bites from mosquitoes, ticks, biting flies, ants, scorpions and some spiders also can cause reactions. Scorpion and ant bites can be very severe. Some insects also carry disease such as West Nile virus or Lyme disease.

Signs and symptoms:

Mild reaction	Severe reaction
• Nausea • Facial swelling • Difficulty breathing • Abdominal pain • Deterioration of blood pressure and circulation (shock)	• Difficulty breathing • Swelling of the lips or throat • Faintness • Dizziness • Confusion • Rapid heartbeat • Hives • Nausea, cramps and vomiting

Basic care and treatment for mild reactions:

- Remove the stinger, especially if it's stuck in your skin. This will prevent the release of more venom. Wash the area with soap and water.
- Apply a cold pack or cloth filled with ice to reduce pain and swelling.
- Try a pain reliever, such as ibuprofen (Advil, Motrin, others) or acetaminophen (Tylenol, others), to ease pain from bites or stings.
- Apply a topical cream to ease pain and provide itch relief. Creams containing ingredients such as hydrocortisone or lidocaine may help control pain.
- Take an antihistamine
- Call and inform your doctor immediately

NOSEBLEEDS (epistaxis)

Nosebleeds are common, most often they are a nuisance and not a true medical problem. To take care of the following basic steps for stop a nosebleed (epistaxis).

First aid care immediately if

- bleeding lasts longer than 20 minutes
- Nose bleeds after an accident, a fall or head injury, heat stroke, including a punch to the face that can break your nose.

Fig. 2.14 Epistaxis

To take care of the following basic first aid for stop a nosebleed (epistaxis)

- Sit upright and lean forward. This reduces blood pressure in the veins of your nose and slows bleeding. Sitting forward will help you avoid swallowing blood, which can irritate your stomach.

- Pinch your nose. Use your thumb and index finger to pinch your nostrils shut. Breathe through your mouth. Continue to pinch for five to 10 minutes. Pinching sends pressure to the bleeding point on the nasal septum and often stops the flow of blood.

- To prevent re-bleeding, don't pick or blow your nose and don't bend down for several hours after the bleeding episode. Remember to keep your head higher than the level of your heart.

- If re-bleeding occurs, gently blow your nose to clear out blood clots and spray both sides of your nose with a decongestant nasal spray containing oxymetazoline (Afrin, Mucinex Moisture Smart) Pinch your nose again as described above.

Animal Bite

Any bite from an animal (or human) that breaks the skin requires special attention as it carries a high risk of infection. Many animals, including dogs, cats, monkeys, foxes, bats, horses or jackals, can carry the rabies germ. Rabies is a viral infection that targets the brain and nervous system. A person can get rabies by biting or scratching an infected animal. This disease is fatal if it is not treated promptly. All victims of animal bites or scratches need to be provided first aid and referred immediately for further treatment and follow-up.

The following sign and symptoms are seen when bitten by an animal:

- Site of bite marks.
- Puncture wounds (if the skin is broken).
- Scraped skin
- Moderate or severe bleeding.
- Inflammation - Redness, pain, swelling, burning
- Hydro phobia

Basic First Aid Care and treatment

- Wash the wound immediately with clean water for 10-15 minutes to remove the rabies virus from the wound.
- A comfortable position is provided to the victim.
- To provide psychological support reduce anxiety.
- Observe the bite area and place clean cloth over the injury.
- Elevated the injury part.
- Use clean cloth stops the excessive bleeding.
- Stop the bleeding by applying pressure to the wound or use a tourniquet.

- Wipe the saliva of injured limb.
- Wash the bite area with soap and water.
- Clean and dray wound with clean cloth.
- Apply antibiotic ointment and sterile bandage cover the injury part.
- Provide primary first aid Refer to the hospital for specific treatment.
- Observed by the physician and prescribed anti rabies vaccine.
- Wash your hands thoroughly before and after caring for the patient.

Snake Bite:

Introduction

Not all snakes are poisonous and not all snake bites are fatal. Most people die due to fear and lack of information. Poison is also called as venom. There are about 3,000 species of snakes globally, and out of these, only 375 snake species are venomous. Thus, many species of snakes are harmless. In India, there are 270 species of snakes, of which about 60 are highly venomous. Of these, the big 4 common varieties of dangerous snakes are: The Indian Cobra, Common Krait, Russell's viper, Saw-scaled Viper.

If a person is bitten by a snake, following signs and symptoms:

weakness, Drowsiness, bleeding, Fainting, convulsion, nausea or vomiting, numbness, dyspnoea, rapid pulse rate, cardiac arrest, decreased muscle function especially around the eyes, Foaming/Dribbling of saliva, paralysis, The area becomes bluish-purple within twelve hours, difficulty in speaking

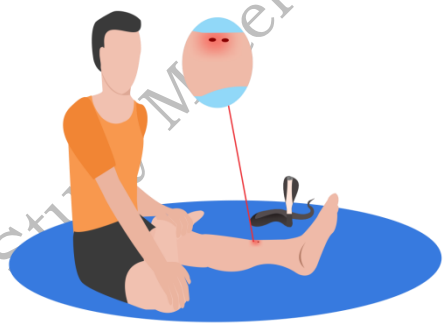

Fig. 2.15 Snake Bite

First Aid management in snake Bite:

- Make sure the area is safe before helping the person.
- The injured person needs immediate help. If you are alone, scream or call for help but do not leave the person.
- Call an ambulance and immediate transportation to the nearest health facility.
- Help the injured person to lie down and prevent him from moving.
- The person should remain calm and not move, this will slow the spread of the poison.
- If it is safe to do so, check to see what type of snake bit the person.
- If possible, note down the characteristics of the snake.
- Monitor for any changes in the person's condition (i.e. consciousness and breathing).
- Do not suck the poison out of the skin or bite, do not rub herbs on the bitten area.

- Do not apply a tourniquet and do not remove rings, watches or tight clothing as swelling may restrict blood flow.
- Cover the wound with a clean cotton cloth or bandage.
- Immediately take the person suffering from snake bite to the nearest health facility.

Activities

Activity 1: Demonstrate measuring body temperature in class room and explain the types of thermometers.

Activity 2: Students prepare a first aid box in the class room with the help of the teacher.

Check Your Progress

A. Match the column

1	Animal Bite	A	Luke warm water
2	Heat stroke	B	Epistaxis
3	ORS	C	Rabies
4	Nose Bleeds	D	Bacteria
5	food contamination	E	Dehydration

B. Fill in the Blanks

1. A person is suffering from fever ranging from 98.8° F – 100.8° F is said to be suffering from _____ fever.
2. In high fever, a person should be kept _____ by sponging with wet towel or applying ice packs in arm pits.
3. _____ is a chronic lung disease that tightness and narrow airways.
4. Back _____ is caused due to problems in ligaments and muscles of spine.
5. _____ is a symptom and not a disease.

C. Short answer questions

1. Describe the steps to take body temperature.
2. What is ORS? Describe recipe for making 1 litre ORS solution
3. Write basic care and first aid treatment for animal bites

Session 3: Immunization

Immunization protects children (and adults) against harmful infections disease, before they come into contact with them in the community. Immunization uses the body's natural defense mechanism, the immune response, to build resistance to specific infections. Nine diseases can be prevented by routine childhood immunization - diphtheria, tetanus, whooping cough, poliomyelitis (polio), measles, mumps, rubella, haemophilus influenza type b (Hib) and hepatitis B. All of these diseases can cause serious complications and sometimes death.

Immunization is given as an injection or in the case of polio vaccine, taken as drops by mouth. Immunization helps children stay healthy by preventing serious infections.

In this session, you will learn about the immunization schedule.

Learning objectives

On completion of this session the student will be able to:

- Importance of Immunization.
- Prepare Immunization schedule chart

Vaccination

'Vaccination' refers simply to the administration of a vaccine, whereas 'immunization' means that the person developed immunity as a result of being vaccinated (or immunized).

Fig.2.16 Immunization kit

What is vaccine?

A **vaccine** is a biological preparation that improves immunity to a particular disease. A vaccine typically contains an agent that resembles a disease-causing microorganism, and is often made from weakened or killed forms of the

microbe, its toxins or one of its surface proteins. The agent stimulates the body's immune system to recognize the agent as foreign, destroy it, and "remember" it, so that the immune system can more easily recognize and destroy any of these microorganisms that it later encounters. Vaccines may be prophylactic (example: to prevent or ameliorate the effects of a future infection by any natural or "wild" pathogen), or therapeutic (e.g. vaccines against cancer are also being investigated. The term *vaccine* derives from Edward Jenner's 1796 use of cowpox (the word variola vaccinae, adapted from the Latin word vaccīnus, and vacca - cow) to inoculate humans, providing them protection against small (cow)pox.

Types of vaccines

(i) **Live vaccines***:* These are preparations from live attenuated organisms. They are potent immunizing agents, e.g. BCG, oral polio, rabies, yellow fever and measles vaccines.

(ii) **Killed Vaccines:** organism killed by heat or chemical injected in to the body and stimulate active immunity e.g. vaccines against cholera, typhoid, whooping cough. They are not as efficient as live vaccines;

there for two or three doses are administered to increase antigenic efficiency.

(iii) **Toxoid preparations:** Certain organisms produce exotoxins, e.g., diphtheria and tetanus bacilli. The toxins produced' by these organisms are detoxified (rendered harmless) to prepare vaccines. Such products are called toxoids.

(iv) **Polyvalent vaccines:** Vaccines prepared from the culture of two or more strains of the same species, e.g., polio and influenza vaccines.

(v) **Combined or mixed vaccines:** When more than one kind of immunizing agent is included in the vaccine, e.g. DPT, TABC, MMR.

Vaccines commonly used in India:-

- DPT vaccine provides protection against diphtheria, whooping cough and tetanus. It is a mixture of purified diphtheria and tetanus toxoids and killed Bordetella pertussis organisms absorbed on aluminium hydroxide. Three doses of 0.5 ml. each are given and it is a administered by intramuscular injection with a booster dose.
- DT vaccine is a protection against diphtheria and tetanus. It contains purified diphtheria and tetanus toxoid absorbed on aluminum hydroxide. The dose is 0.5 ml given intramuscularly.
- TT vaccine is for protection against tetanus. It contains purified tetanus toxoid absorbed on aluminum phosphate. The dose is 0.5 ml. administered intramuscularly.

Polio vaccine (OPV) is a live, attenuated trivalent vaccine containing three strains of polio virus. 2 drops of vaccine is given orally. Warm milk should not be given for at least half an hour after the vaccination.

BCG vaccine contains live attenuated tubercle bacilli and is freeze dried It has to be reconstituted before use with a diluents (normal saline). The diluents used for reconstituting BCG should be cooled before use. The dose is 0.1 ml given by the Intradermal route, using a tuberculin syringe. The reconstituted vaccine should be used within 3 hours.

Typhoid Vaccine is a phenol killed vaccine containing the organisms Salmonella typhi and Salmonella paratyphiA. The dose is 0.5 ml. given subcutaneously.

Measles vaccine is live vaccine containing attenuated measles virus. It is freeze dried and has to be reconstituted before use. The dose is 0.5 ml which is given subcutaneously. Once reconstituted, the vaccine must be used within 4 hours.

Cold Chain

Vaccines are highly perishable and have to be stored at specific temperatures in

order to maintain their efficiency. Vaccines are easily destroyed or lose their potency if exposed to heat and light. Therefore, they have to be stored and transported at specific temperatures. The system of storing and transporting vaccines at low temperature is called the Cold Chain. Even under these conditions the life of vaccines is limited. Storing and transporting of vaccines correct temperature so long time duration keep safe vaccines. So need cold freezers room, refrigerator, cold boxes, ice box, freezers.

Importance of Immunization:

Each year, vaccines prevent more than 2.5 million child deaths globally. An additional 2 million child deaths could be prevented each year through immunization with currently available vaccines.

- **Immunization saves a child's life:** Immunization helps to protect your child against various diseases.

- **Immunization is safe and effective:** All vaccines that are given to children are completely safe and effective, as various medical professionals have tested them. The only discomfort can be pain, redness or tender feeling among few.

- **Immunization prevents spread of diseases:** If a person is immunized, there is little to risk of an epidemic. Thus, it also prevents spreading of the disease.

- **Immunization saves time and money:** A prolonged illness can take a toll on your finance as well as your precious time. Immunization is a good investment, as it saves time, money and promotes good health.

- **Immunization protects future:** Immunization has helped to eradicate polio to some extent. If we keep on practicing immunization, in near future we will be able to eradicate all these diseases completely.
- Immunization has reduced mortality rate
- Immunization has made children more healthy and fit.
- Immunization promotes long life span.
- Immunization is protected from disease.
- It is very important must educate and awareness in community about the immunization programme.
-

Side effects of immunization: -

- Common side effects of immunization are redness and soreness at the site of injections and mild fever, pain.
- Paracetamol may be required to help ease the fever and soreness.
- While these symptoms may concern you and upset your child at the time, the benefit of immunization is protection from the disease.
- Other side effects are very rare but if they do occur, a doctor should be consulted immediately.

Universal Immunization Program

Universal Immunization Program, popularly known as UIP, gained momentum in 1985 and it was implemented in phased manner to cover all districts in India by 1989-90. Immunization is one of the key areas under National Rural Health Mission of Government of India. Since 1997, immunization activities have been an important component of National RCH Programme. Certain diseases may require universal immunization of a population to control them. Such efforts usually target infants in the first year of life so that immunity is completed as early as possible before the risk of infection, (e.g., diphtheria-pertussis-tetanus, polio). Others may require immunization of only selected high risk groups (e.g., at risk elderly for Pneumococcus).

In some cases the target group may not be the group that the vaccine is designed to protect (e.g., rubella vaccination of all children and females of child bearing age in order to protect the fetus). Since there are regional differences in infection rates and severity of every disease, the choice of vaccine and dosage regimen will vary with the local epidemiology of the disease, specific target population, and health system. The effectiveness of the healthcare delivery system can also vary with different vaccines, vaccine efficacy, and organization of the local health care service organization. Care must be taken to ensure the balance of risks and benefits, where cost constraints or logistical limitations make continuous universal immunization impossible.

National Immunization Schedule Chart

The national immunization programmed is specialized program by the Govt. of India is started in 1985.
Let us now read through the National Immunization schedule for Infants, Children and Pregnant Women to understand the importance of immunization against various diseases.

National Immunization Schedule for Infants, Children and Pregnant Women

Vaccine	When to give	Dose	Route	Site
For Pregnant Women				
TT-1	Early in pregnancy	0.5 ml	Intra-muscular	Upper Arm
TT-2	4 weeks after TT-1*	0.5 ml	Intra-muscular	Upper Arm
TT- Booster	If received 2 TT doses in a pregnancy within last 3 yrs*	0.5 ml	Intra-muscular	Upper Arm
For Infants				
BCG	At birth or as early as possible till one year of age	0.1ml (0.05ml till 1mth age)	Intra-dermal	Left Upper Arm
Hepatitis B	At birth or as early as possible within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
OPV-0	At birth or as early as possible within the first 15 days	2 drops	Oral	Oral
OPV 1,2 & 3	At 6 weeks, 10 weeks & 14 weeks	2 drops	Oral	Oral
DPT 1,2 & 3	At 6 weeks 10 weeks & 14 weeks	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Hep B 1, 2 & 3	At 6 weeks 10 weeks & 14 weeks	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles	9 completed months-12 months.	0.5 ml	Sub-cutaneous	Right upper Arm
Vitamin-A (1stdose)	At 9 months with measles	1 ml (1 lakh IU)	Oral	Oral
For Children				
DPT booster	16-24 months	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles 2nd dose	16-24 months	0.5 ml	Sub-cutaneous	Right upper Arm
OPV Booster	16-24 months	2 drops	Oral	Oral
Japanese Encephalitis**	16-24 months	0.5 ml	Sub-cutaneous	Left Upper Arm
Vitamin-A***				
(2nd to 9th dose)	16 months. Then, one dose every 6 months up to the age of 5 years.	2ml (2 lakh IU)	Oral	Oral
DPT Booster	5-6 years	0.5 ml.	Intra-muscular	Upper Arm
TT	10 years & 16 years	0.5 ml	Intra-muscular	Upper Arm

*Give TT-2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give TT to a woman in labour, if she has not previously received TT.

** JE Vaccine, in select endemic districts after the campaign.

*** The 2nd to 9th doses of Vitamin A can be administered to children 1-5 years old during biannual rounds, in collaboration with ICDS.

Fig. 2.17 National Immunization

Activities

Activity 1: Prepare a sample immunization schedule chart for a child.

Activity 2: Visit the vaccination center and collect photographs of the vaccines.

Check Your Progress

A. Fill in the Blanks

1. _____ is a biological preparation that improves a person's immunity to a particular disease.
2. _____ protects children against harmful infections, before they come into contact with them in the community.
3. The national immunization programmed by the _____ is started in_____
4. The term vaccine is derived from_____ use of cowpox in 1796.

B. Short Answer Questions.

1.What is immunization?

2.Define vaccine and explain its types?

3.Explain the cold chain in storage and transportation of vaccines?
4.Write the importance of immunization?

Session 4: Personal Hygiene Practices for Telehealth Services Coordinator

Personal hygiene supplements good health. Neglect of cleanliness may be the reason for many infectious diseases and hence improving the hygiene standards can prevent many epidemics globally. Contribution of every individual in maintaining personal and environmental hygiene influences the index of health standards of any society. Negligence of hygiene practices causes dandruff, bad breath, worm infestation, diarrhoea, common cold and a range of many infections. Indian cultural traditions focuses on the value of maintaining personal hygiene. We follow a sequence of daily care activities like oral hygiene, bathing, dressing etc. which inculcates the habit of keeping our body clean. By understanding the contents of this unit, you will learn the methods of washing hands, personal grooming and its role in maintenance of health.

Medical Hand Hygiene Practices

The session explains the importance of hand washing for good health. Hygiene is a set of routine personal cleaning practices performed for the preservation of health. Modern medical sciences follow certain standards of hygiene during different situations. The concept of hygiene varies among region, culture, gender groups or individuals. Some regular hygienic practices are considered as good habits by most people of the society; while the neglect of hygiene may be treated in disgusting, disrespectful or even threatening manner.
Hand washing is the act of cleaning one's hands with or without the use of water or another liquid, or soap, for removing soil, dirt, and/or microorganisms. Medical hand hygiene pertains to the practices to be followed while applying medicine or providing other medical services that reduces or minimizes spreading of diseases.

Hand washing with soap is useful to prevent diarrhea and acute respiratory infections (ARI). The purpose of hand washing is to clean hands of disease spreading microorganisms (including bacteria or viruses) and harmful chemicals. This should be followed strictly by people who work in food preparation industry, medical field; also by all individual's. It serves to protect us from diseases transmitted through fecal-oral routes and direct physical contact (such as impetigo). Alcohol gels is another form of disinfectant and helpful in killing bacteria, but their effectiveness is disputed, as it may lead to antibiotic-resistant bacterial strains. It is a recommended good practice to clean hands after using the toilet, changing the napkins, handling the animals and touching food. Use liquid soap and warm running water for at least 10 seconds to wash hands.

Why is hand hygiene important?

The hands normally have a "resident" population of micro-organisms apart from those accumulated during everyday activities termed "transient" organisms. Most

of the germs on our hands are harmless, but some causes cold, flu, skin infections or diarrhea. Forgetting to wash our hands causes spreading of these germs to other people; also infect ourselves when we touch our eyes, mouths or open cuts. Hand washing prevents the microorganisms getting displaced to other surfaces, patient or vulnerable areas on the patient.

Why is hand hygiene important in health care?

Patients are more vulnerable to infection from germs carried on their hands or other hospital people when brought into a healthcare environment. Patients, visitors, health care workers, nursing staff and doctors can cut the risk of spreading infections by regularly cleaning their hands.

Advice to healthcare staff and patients

All health care staff should wash hands with soap or use alcohol gel:

- Before and after direct patient contact;
- Attending to the toilet needs of the patient.
- After Medical procedures;
- Wearing and removing gloves.

The temperature of hot water used for hand wash is not sufficient to kill bacteria. Bacteria grow much faster at body temperature (37^{o}C). Warm water with soap is more effective than cold water for removal of micro-organisms as flowing water helps to dissolve the soil and dirt from hands easily. A hand sanitizer or hand antiseptic is a non-water-based hand hygiene agent. Hand sanitizers are effective against bacteria but not for some viruses which commonly cause contagious gastroenteritis. Reduce touching wound dressings, stitches, catheters or an intravenous line, unless it is unavoidable as it may lead to spreading of germs to other parts of the body. Medical hand-washing is ideally done for a minimum of 15 seconds, using soap and water or gel to lather and rub each part of the hands. Let us now practice the steps used for hand washing.

Initiate Small projects to create awareness in the society about hand washing practices (ICT based or camps)

Steps for Hand Washing

Personal Grooming Practices for Telehealth services coordinator
Personal grooming (also called titivating and preening) involves cleaning of body parts, trimming of nails and hair to improve the personal hygiene.

Importance of Personal Grooming

Personal grooming encourages the resident to maintain a pleasing and attractive appearance and develop a positive self -image.

- It makes a person neat and personally appealing.
- Grooming indicates the readiness of a person for work.

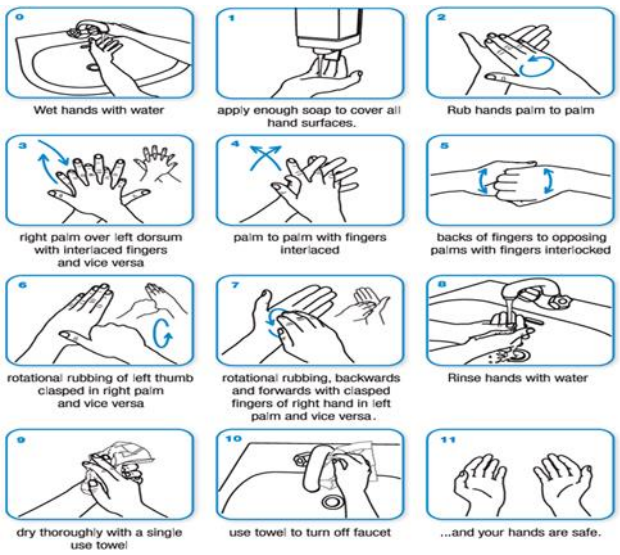

Fig. 2.18 *Stepwise procedure of hand washing*

Basic Grooming

Basic grooming involves practices that are followed daily to keep healthy and to make effective presentation. Practices that can be followed regularly are :

- Groom your facial hair. Facial hair should be groomed by avoiding patchy beard, long black mustache, or chin pube goatee.
- Brush your teeth twice daily and wash your hair regularly.
- Wash your hair.
- Take care of your skin.
- Keep your finger nails and toe nails trimmed and clean.
- Wear deodorant.
- Pay attention to keep your ears and nose clean.
- Use clear communication skills while speaking to the patient and their relatives.
- Wear identity card and clean uniform

Basic Dressing

Common mistakes while dressing for work:

- White socks with dark shoes and vice versa can be better avoided.
- Wear T-shirts that are properly fitting.
- Same outfit should not be repeated for two days or more in a row.
- Avoid wearing faded clothes.
- Do not wear clothes that are overly wrinkled, dirtied or stained.

Basic Appearance

- Get your hairs looking good.
- Trim it in fashionable style.
- Ensure you wear glass frames appropriate to the situation.
- Maintain your physique by involving in enjoyable activities like rock climbing, or kick boxing, or dancing.

- Pick something you enjoy doing.

Activities

Activity 1: Discuss the following topics in groups: How hand washing helps in preventing spread of germs? What are the precautions to be followed while using various types of soaps/ hand sanitizers?

Activity 2: Practice the steps of hand washing.

Activity 3: Perform activities for demonstrating good grooming habits.

Activity 4: Develop project for creating awareness in your community about hand washing.

Check Your Progress

A. Fill in the Blanks.

1. Personal hygiene supplements _____.
2. Personal grooming is otherwise called _____.
3. Basic grooming enhances your _____.

B. Multiple Choice Questions.

1. _____ is a set of practices performed for the preservation of health.
   a) Hygiene
   b) Health
   c) Environment
   d) Habits
2. Health education can _____.
   a) Improve community hygiene
   b) Prevent Illness
   c) Inculcate positive health attitude
   d) All the above
3. _____ is an important measure to prevent the spread of pathogens.
   a) Unclean hands
   b) Washing hands
   c) Rubbing hands
   d) None of these

C. Match the part of body with hygiene practices.

1. Hair	a) Wash hands with soap and dry
2. Teeth	b) Use soap and water while bathing
3. Skin	c) Drying and brushing hairs
4. Hands	d) Brush teeth twice after meals

E. Short Answer Questions.

1. What is hand hygiene?
2. Why do we need to practice good hand hygiene?
3. What is personal grooming?
4. Why grooming is important?

Session 5: Maintain Safe, Healthy and Secure Environment

Work conditions causes stress on physical and mental health of individuals. Occupational health is a specialized service to attend to the health-related needs of workers. It focuses on promotion of good health practices for maintaining the physical and mental wellbeing of workers related to various fields. If we observe closely the health needs of workers, the practices followed by any organization should protect and prevent hazards to the people or the environment. A hazard may be any risk or threat to the health and safety of people. At work place the commonly faced hazards are physical, chemical, biological or psycho-social in nature. While working in healthcare sector, the major hazards encountered can be exposure to heat, light, various sound frequencies, radiation, toxic chemicals, infectious diseases and mental tensions. We have to be aware that treatment is not available for most of the occupational diseases that develop gradually.

As per recommendation of WHO and ILO, any organization employing more than 200 workers should have an Occupational Health Service formed with professionals including medical officers, health administrators and staff to promote health promotion and preventive services and to provide facility for emergency medical care for workers engaged in any type of work.

The content of this session mentions the safe practices to be followed for ensuring safety of the healthcare worker and the patient.

Fig. 2.19 *Bio environment safety*
Courtesy:https://goo.gl/1LaUNY

Promoting Safe Working Environment

To promote a safe working environment, following measures may be adopted:

- You should ensure yourself in terms of knowing your organization's health, safety and security procedures and follow them while you work.
- Before you begin work always:
  - Ensure risk assessments if any.
  - Examine the working place where you work and all equipment you use to rule out possible risk factors, if any, and they are safe and enough to meet your organization's health and safety policies.
  - Try to eliminate, wherever possible, anything that might pose a health and safety hazard.
- Ensure patient's needs and choices, take into account all measures that protects your own safety and the safety of patients, staff and others while on work.
- Work within the limits of your own role and responsibilities in relation to health and- safety.

- Take the help of your supervisors to sort out health and safety problems wherever and whenever necessary.
- Report health and safety issues to the appropriate superiors in line with the law and your organization's policies.

How to prevent hazards at workplace

To ensure all possible risk elimination, you must:

While Working with others, try to reduce potential risks at workplace and therefore
- Make sure that your own health and hygiene does not pose a risk to others.
- Making sure of your presence to all appropriate people at all times to make sure you are safe.
- Take appropriate action in case of an accident or injury or harm.
- Check the presence of unwanted people in your workplace and politely instruct them to move out.
- Use approved procedures under supervision, when carrying out work that could be dangerous.
- Using correct moving and handling techniques.
- Using appropriate hygiene procedures.
- Wearing correct protective clothes for any kind of the situation.
- Using and storing equipments and materials at right place. Dealing with spillages and getting rid of waste.
- Take immediate and appropriate action to deal with emergencies, like:
- Fire
- Security problems
- Accidents

Use your skills and experience until appropriate help arrives:

You must:

- Inform for the appropriate help.
- Continue to provide help under supervision, until someone who is qualified to deal with the emergency is available.
- Support patients and others including family members who may be affected by the emergency.
- Record and report incidents and emergencies to superiors, accurately in accordance with your organization's policies.

Hospital Electrical Safety Measures

Follow the hospital electrical safety measures by doing the following:
- Use electrical equipment for the intended purpose only.
- Keep television sets, and all other electrical equipment and appliances away from bathtubs and washbasins.
- Check all small appliances before use to ensure that they are in maintained in good working order. Ensure periodic maintenance checks of all electrical equipment.
- Remove a plug away from a wall socket by holding the plug, not the cord.
- Do not overload an electrical outlet point.
- Never use faulty equipment. If an appliance overheats, produces a shock or gives off an odour while being used, remove the appliance from the area. Follow procedures to have the appliance evaluated by maintenance.

Fig. 2.20 electrical safety measures

Hospital Fire Safety Measures

Hospital fire safety measures are very important and must always be followed.
1. Despite the use of fire resistant material, and compliance with fire regulations, fires accidents still happens. Health care organizations should have regular fire drills so that all personnel know exactly what to do. Health care personnel like General Duty Assistant should be trained in:

- Fire prevention.
- Locate and use of fire alarms.
- Locate and use of fire extinguishers.
- Locate emergency exits.
- Evacuation procedures.

2. Oxygen supports combustion. Poster signs to show that oxygen is in use wherever applicable. If a patient is under oxygen as part of his treatment, be sure make aware the patient, his roommates, and visitors know that smoking is prohibited.

3. If a fire occurs, follow these steps:

- Activate the fire alarm procedures.
- Turn off oxygen knob, lights, and all other electrical equipment in the vicinity of the fire.
- Evacuate the patients who are in immediate danger.
- Signboard to notify the "switchboard" in hospital should be prominent, along with glow sign board of fire extinguisher.
- Close windows and doors to reduce ventilation.
- Using the fire extinguisher, attempt to extinguish the fire.
- Return patients who are not endangered to their rooms.

Fig. 2.20 Fire safety measures

Patient Care Environment Safety Measures

Take a look at the environment safety measures to be followed for patient care:
1. **Identify patients at risk for injury**. Those at risk specifically may include:

- Elderly or confused patients.

- Patients with impaired vision or hearing.
- Patients with impaired mobility (wheelchairs, walkers, and partial paralysis}.
- Patients with a history of falls.
- Patients with a history of substance abuse.
- Patients receiving medication that interferes with motor- neuron functions.

2. **Protect the patients at risk from any injury.**

3. **Prevent falls by:**

- Placing the bed in the low position.
- Keeping the bedside railing up when the patient is not receiving bedside care.
- Advising the patient to wear low-heeled shoes when walking.
- Ensuring that non-skid strips or mats are affixed at the outside bottom of bathtubs and shower areas.
- Ensuring that bathtubs have supporting handrails in place when needed.
- Warning patients and visitors when floors are wet and slippery. Proper signboards to be kept at the time of housekeeping.

4. **Prevention of burns by hot liquids:**
- Placing coffee, tea, and other hot liquids on the table where the patient can reach them easily and safely.
- Carefully following policy when using hot-water bags or heating pads. Because of the danger of burning patients, many health care facilities do not allow their use.

5. **Prevent the spread of infection:**

A hospital under health care facility may follow its own practices to control infection. However, the procedures generally followed by and large, are the recommendations from the Centers for Disease Control (CDC), United States agency that studies various pathogenic organisms, spread of contagious diseases, and methods used to control the spread of infections.

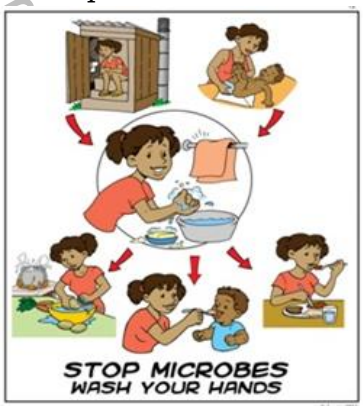

Fig.2.2 1 *Handdisinfection*

Some of the preventive tips in this line of action:

- Preventing disease due to infections, is a high priority in hospital care services. General Duty Assistant under supervision, should use disinfection and sterilization techniques that prevent the spreading and growth of microorganisms.
- Two methods are used to eliminate the presence of microorganisms and thus prevent infections. These two methods are called surgical asepsis and medical asepsis.

- Surgical asepsis is a way of practice that eliminates the presence of all microorganisms. This practice is called sterilization or sterile asepsis like washing the hands and arms with germicidal solution.
- Medical asepsis refers to practices that reduce the number and inhibit the growth of microorganisms, especially pathogens or disease-causing bacteria.
- Technique of asepsis mandates the use of antimicrobial agents, hand washing, cleaning the equipment.

Health and safety risks at workplace: The probability of a person to experience an adverse health effect if exposed to a hazard are considered the risk factors at work. Let us now learn about the various types of hazards and their cause. This helps to identify the various hazards that you may encounter at workplace.

Types of Hazards

•Biological – Biological hazards are caused by living organisms like bacteria, viruses, insects, plants, birds, animals, humans, etc.

•Chemical – Chemical hazards, which include acids, poisons, cleaning agents, etc. depends on the physical, chemical and toxic properties of the chemical. The severity of the hazard depends on the toxic properties of the chemical.

•Radiation – Radiation hazards are related to exposure

•to radiations from radioactive substances.

•Ergonomic – Ergonomic hazards are caused due to same posture and movements, improper lay out of workstation (e.g. computer workstation, workstation for repair of electrical gadgets, etc.), faulty designed chairs, tools and equipment, wrong postures, etc. Wrong postures also induces physical fatigue and/or bodily harm, including back pain, and discomfort in shoulders and lower limbs.

• Physical – Physical hazards are caused due to slippery surfaces, falling objects, manual handling (lifting, pushing, carrying), sharp tools and equipment, radiation, magnetic fields, extreme pressure (high pressure or vacuum), excessive loud and prolonged noise, and bullying (abnormal, repeated behavior directed against a worker or group of workers which results in a risk to health and safety). It may result in stress, depression, loss of self-esteem, feelings of guilt, phobias, sleep and eating disorders, sexual harassment (a situation in which unwanted behaviour with a sexual connotation, expressed physically, verbally or non-verbally takes place), verbal threat, abusing, use of weapons, etc.

• Psychosocial –Psychosocial hazards are caused due to violence, excessive pressure or stress at workplace for meeting deadlines, conflicts at workplace, etc. It also includes hazards due to discrimination on the grounds of caste, race, skin colour, ethnic origin, sex, religion, etc.

• Safety – Safety hazards at workplace include slipping or tripping, inappropriate machine guarding, collision, bumps, road accidents, fire accidents, equipment malfunctions or breakdown and electrical accidents (it could result in skin burns affecting the areas that are in contact with the electrical current or electric shock due to electrical discharge).

Fig.2.22: Types of hazards

Recording of Personal and Medical Data of Patient:-

The clerk in the record section is responsible for recording certain data that are essential for identification of the patient. He/she questions the patient or his family members to get the name, address, age, sex, religion, occupation, income, marital status, address, telephone number and name and address of the nearest relative. He/she records it in the out patient record. Patients too ill to answer questions should be admitted immediately and the necessary data is supplied by the family or friends at the first opportunity.

In order to provide proper service and to give immediate care, it is necessary to know the diagnosis or suspected diagnosis, the duration of illness, the name of the physician to whom he/she is to be referred. This can be obtained by appropriate questioning of the patient. The patient is given the out patient number which he keeps with him/her for future reference. He is given necessary direction to proceed further for consulting the doctor.

Medical History and Examination of Patient

A detailed social and medical history of the patient is taken by the physician and is recorded. The patient's temperature, pulse, respiration and blood pressure are recorded. A thorough examination of the body from head to foot will reveal any deviation from normal structure and functions which will help the physician to diagnose the disease. Necessary investigations, such as X- ray, laboratory test etc. are also made to diagnose the disease and to prescribe the treatment. Relatives of friends who bring the patient to the hospital often want to meet, and talk to the physician about the patient. The Telehealth Care coordinator should make necessary arrangements for the relatives to meet the physician. The patients suffering from mild sickness are sent home without admitting in hospital for treatment. Others are admitted to the hospital for further investigations and treatment.

Fig.2.23 Triage

Transporting Patient who are not very ill and are allowed to walk are escorted to the clinical division by a Telehealth Care coordinator or an attendant.
Transporting Patient Moving an injured patient to and within the hospital must be performed with great care. The hospital transportation system for patients are internal, external transportation and various methods of triage during transportation. Internal transportation includes use of trolleys, stretchers, lifts, escalators, etc. for transporting patients, equipment's and supplies and external transportation include ambulances, relief van, train, or any manual laborers etc. The aim of transportation is to enable the victim to reach the destination without detoriation of his condition. A severely injured or ill person should be immobilized unless there is immediate threat to his life. A seriously ill patient should never be left in the hands of untrained personnel. A female patient should never be left with a male attendant.

Category	What this means	What you can do
I	Highest priority for immediate help to those people who need surgery	Help to evacuate and safely Transport to medical center
II	Low priority minor injury	Comfort the injured
III	Need your First Aid but can wait safety for surgery	Give First Aid and arrange for transportation

Table: Triage during Transportation

Triage in Treatment (First Aid & Transportation)

1. **Red tag** (highest priority) for example severe breathing difficulty, Cardiac arrest, Burn involving respiratory tract, Heart attack, Poisoning etc.
2. **Green tag** (2nd priority): Severe burn, Spinal injury, Moderate hemorrhage, Multiple facture, Head injuries.
3. **White tag** (least priority): Minor fracture, Minor bleeding, Moderate or minor burns.

Transportation by Stretcher

It is used for seriously ill or injured victim.

Types
- Farley stretcher (general stretcher)
- Trolley bed (general with trolley)
- Neil Robertson stretcher (used for rescue purpose)
- Para guard stretcher (foldable above)
- Improvised stretcher.
- Utile stretcher (foldable from middle) Pale and canvas stretcher
- Scoop (orthopedic) stretcher.

Carrying a loaded stretcher

1. Head should be higher than the feet.
2. Carries feet first except in following situations:

- When carrying a victim to the side or from a bed.
- When going down hills or when the victim's lower limbs are injured or there is hyposthenia.
- When loading a victim into an ambulance.

Fig.2.24: Scoop Stretcher

Referral system:

Referral is a dynamic process, in which a health worker at one level of the health system, having insufficient resources (drugs, equipment, skills) to manage a clinical condition, seeks the help of a better or differently resourced facility at the same or higher level to assist in.

Activities

Activity 1: Visit a nearby hospital and observed various hazards. Fill the common hazards in the table given below:

Type of Hazards	Place prone to get the Hazard in the Hospital
Biological	
Chemical	
Radiation	
Ergonomic	
Physical	
Psychosocial	

Activity 2: Demonstrate the student's in school how to use electrical equipment's and faire Safety Measures.

Check Your Progress

A. Short Answer Questions.

1. What is safe and secure working environment.
2. Write the patient care environment safety measures at home tele health care services.
3. Write the various methods of triage during transportation.
4. Define referral system.
5. Enlist various types transportation by Stretcher injured and ill person.

Module 3 Infection control and Bio-Medical Waste Management

Introduction

Infection control and prevention are pivotal in safeguarding both patients and healthcare professionals from the spread of infectious diseases. These practices are essential in healthcare settings, where the risk of infection is heightened due to close proximity and frequent exposure to pathogens. Effective infection control strategies help in reducing the incidence of healthcare-associated infections (HAIs), enhancing patient safety, and ensuring a safe working environment for healthcare workers. By implementing rigorous infection control measures, we can prevent outbreaks, reduce healthcare costs, and maintain the overall quality of care.

Learning Outcomes

After completing this module, you will be able to:

- Explain the importance and mechanism of proper and safe disposal, transportation and treatment of bio-medical waste.
- Explain the concept of healthy living.
- Explain various vaccinations against infectious diseases and immunization programmes.
- Describe the hand-hygiene guidelines and procedures used in healthcare-settings.
- Discuss the importance of infection control and prevention.

Module Structure

Session 1: Infection Control

Session 2: Bio-Medical Waste Management

Session 3: Sources and Disposal of Bio-Medical Waste

Session 4: Segregation and Transportation of Bio-Medical Waste

Session 5: Role of Hospital Staff in Bio-Medical Waste Management

Session 1: Infection Control

Microorganisms are present everywhere. Since they cause contamination, infection and decay, it becomes necessary to remove or destroy them from materials or from

areas in the hospital. There are various measures adopted in order to prevent the spread of microorganisms in the hospital. Good housekeeping is therefore, of paramount importance in a hospital. Providing safe, clean and orderly environment is the responsibility of all the personnel in a hospital. Every patient has the right to be protected from the Hospital Acquired Infections. In order to ensure that the patients are protected from HAIs, various procedures and practices are adopted which include cleaning, sterilization and disinfection using physical, chemical and other methods. In this session, you will learn about the various agents, machines, equipment and methods adopted by the medical staff in disinfecting ward and equipment.

Let us first try to understand the meaning of some of the common terms, such as cleaning, sterilization and disinfection used in prevention and control of microorganisms.

Cleaning

Cleaning plays an important preparatory role before sterilization or disinfection. Cleaning helps in removing soil and other dirt and reducing the microbial burden, making sterilization more effective. The various equipments that are used for cleaning include, but not limited to the following:

- Floor cleaning machines
- Swiping machines
- Floor scrubbing machines
- Floor polishing machines
- High pressure machines to clean bathrooms

Daily cleaning: This includes sweeping and mopping floors, dusting furniture, cleaning fixtures, walls, ceilings, windows and bathrooms, emptying trash cans, etc.

Periodic Cleaning: It includes washing windows, waxing floors, cleaning carpets, dusting high ceilings and changing drapers.

Discharge cleaning: This includes cleaning patient room after discharge or transfer of a patient and readying it for another patient.

Exterminating bugs and pests: Hospital's Integrated Pest Management (IPM) plans help direct a hospital in carrying out its pest control practices regularly. An IPM programme is a pest management approach to preventing and managing pest problems in the least hazardous manner possible. It emphasizes on pest prevention through good sanitation practices and maintaining structures in optimum repair. Pesticides are used only when needed, primarily in baits. Records are kept of all pesticide applications. The hospital should utilize the services of a licensed pest control agency. All hospital staff should be educated about the hazards of pesticides and the advantages and principles of IPM. Prior notification of pesticide use in the hospital should be done well in advance and all precautions should be taken.

Trash and garbage removal: Waste generated from the hospital has to be carefully disposed of as per the guidelines issues by the government. The various types of waste generated in the hospital include, but not limited to the following:

a) **Solid waste –** This waste is also called municipal waste or non-regulated medical waste. This is general trash, similar to what you would find in a hotel but with more plastics and packaging.
b) **Regulated Medical Waste (RMW) –** This waste stream is also called potentially infectious material, red bag waste or bio hazardous waste.
c) **Pharmaceutical Waste –** Some pharmaceutical waste is considered hazardous while a large majority may not require handling as hazardous waste, but should receive special disposal considerations, including controlled substances.
d) **Universal Waste –** Universal waste include batteries, pesticides, mercury-containing equipment, bulbs (lamps), etc.
e) **Recyclables –** Recyclables are items and materials bound for the waste stream that can be converted into a reusable material. Recyclables in healthcare include the usual suspects found in commercial buildings such as paper, cardboard, beverage and food containers, metal and glass.

Sterilization: Sterilizations defined as the process by which an article, surface or medium is freed of all living microorganisms either in the vegetative or spore state.

Disinfection: Disinfection means the destruction or removal of all pathogenic organisms, or organisms capable of giving rise to infection. This is the freeing of an article from some living organisms and is used in conditions where sterilization is not needed, e.g., disinfection of bed-pans, wash basins, furniture, eating utensils and clothes. A perfect disinfectant would also offer complete and full sterilization, without harming other forms of life, be inexpensive, and non-corrosive.

Antisepsis: Antisepsis is used to indicate the prevention of infection, usually by inhibiting the growth of bacteria in wounds or tissue. Chemical disinfectants which can be safely applied on the skin or mucous membrane and are used to prevent infections by inhibiting the growth of bacteria are called antiseptics.

Decontamination: Decontamination refers to the process of rendering an article or area free of danger from contaminants, including microbial, chemical, radioactive and other hazards.

Difference between Antispetics and Disinfectants

Antiseptics	Disinfectants
• Use on skin and mucous membrane to kill microorganisms • Not for use of inanimate objects	• Use to kill microorgansim on inanimate objects • Not for the use on skin and mucous membrane

Properties of an Ideal Disinfectant

The properties of an ideal disinfectant include the following:

- Resistant to inactivation
- Broadly active in killing pathogen
- Non-poisonous
- Penetrating to pathogens
- Not damaging to non-living materials
- Stable
- Easy to work with and not unpleasant

The various agents used in sterilization can be classified as follows:

A. Physical agents
   - Sunlight
   - Drying
   - Dry heat : flaming, incineration, hot air
   - Moist heat: pasteurization, boiling, steam under normal pressure, steam under pressure
   - Filtration : candles, asbestos pads, membranes
   - Radiation
   - Ultrasonic and sonic vibrations

Fig.3.2 Autoclave machine

Fig.3.3 Chemical Agents

B. Chemical
   - Alcohols: ethyl, isopropyl, trichlorobutanol
   - Aldehydes: formaldehyde, glutaraldehyde
   - Dyes
   - Halogens
   - Phenols
   - Surface – active agents
   - Metallic salts: e.g.salts of Ag, Cu, Hi
   - Gases : ethylene oxide, formaldehyde, beta propiolactone

Effectiveness of Antimicrobial Agent Activity

Destruction of microorganism and inhibition of microbial growth are not simple

matters because the efficiency of an antimicrobial agent (an agent that kills microorganisms or inhibits their growth) is a affected by at least six factors.

1. **Population Size:** Because an equal fraction of a microbial population is killed during each interval, a larger population requires a longer time to die than a smaller one. The same principle is applicable to chemical antimicrobial agents.

2. **Population Composition:** The effectiveness of an agent varies greatly with the nature of the organisms being treated because microorganisms differ markedly in susceptibility. Bacterial endospores are much more resistant to most antimicrobial agents than are vegetative forms, and younger cells are usually more readily destroyed than mature organisms. Some species are able to withstand adverse conditions better than others. Mycobacterium tuberculosis, which causes tuberculosis, is much more resistant to antimicrobial agents than most other bacteria.

3. **Concentration / Intensity of an Antimicrobial Agent:** Often, but not always, the more concentrated a chemical agent or intense a physical agent, the more rapidly microorganisms are destroyed. Sometimes an agent is more effective at lower concentrations. For example, 70% ethanol is more effective than 95% ethanol.

4. **Exposure Time:** The longer a population is exposed to a microbiocidal agent, the more organisms are killed.

5. **Temperature:** An increase in the temperature at which a chemical acts often enhances its activity. Frequently a lower concentration of disinfectant or disinfectant or sterilizing agent can be used at a higher temperature.

Fig.3.4 Antimicrobial agent

6. **Local environment:** The population to be controlled is not isolated but surrounded by environmental factors that may either offer protection or aid in its destruction. A second environmental factor is organic matter that can protect microorganisms against heating and chemical disinfectants. It may be necessary to clean an object before it is disinfected or sterilized.

Surgical and medical or dental equipment should be cleaned before sterilization because the presence of too much organic matter could protect pathogens and increase the risk of infection. The same care must be taken when pathogens are destroyed during the preparation of drinking water. When a city's water supply has a high content of organic material, more chlorine must be added to disinfect it.

Antimicrobial Mode of Action of Disinfectants and Antiseptics

The disinfectants and antiseptics acts in the following ways:

1. Denaturation of bacterial protiens by disrupting hydrogen and disulfide bond (for example phenol in high concentration, alcohol, heavy metal in high concentration, acids, alkalis, aldehydes).
2. Damages to bacterial membrane (lipids and/or protiens), causing leakage of intracellular molecules. (for example phenol in low concentration, surfactants, dyes).
3. Interference of bacterial enzyme and metabolim (for example oxidants, heavy metals in low conc., alkylating agents).

Uses

- To sterilise culture media, rubber material gowns, dressing, gloves, etc.
- It is particularly useful for materials which can withstand the higher temperature of hot air oven.

Activities

Activity 1: Visit a nearby hospital and prepare a write-up on the various methods of sterilization and disinfection. Study the various equipment, chemicals and procedures used by the hospital.

Activity 2: Project on autoclave machine how to work for sterilization.

Activity 3: Visit a nearby hospital and observe the use of following chemicals. Write any three use of each chemical given in the table below:

Chemical	Use
Chlorine	1 2 3
Phenol	1 2 3
Alcohol	1 2 3
Iodine	1 2 3
Hydrogen Peroxide	1 2 3

Check Your Progress

A. Fill in the Blanks

1. _____is used on skin and mucous membrane to kill microorganisms.
2. _____ plays an important role before sterilization or disinfection.
3. _____ is the process by which an article, surface or medium is freed of all living microorganisms

B. Answer the following questions

1. What is sterilization?

   _____
   _____
   ____

2. What is disinfection?

   _____
   _____
   ____

3. What is antisepsis?

   _____
   _____
   ____

Session 2 : Bio-Medical Waste Management

In healthcare industry, the materials are not utilized fully or after utilization, something remains as left over, which is discarded, and treated as waste. Modern hospitals consume lot of materials for rendering health services to the people. Wastes are generated as a result of diagnostic, therapeutic, immunization or research activities in the hospitals. These waste materials have the potential

of transmitting serious diseases to the healthcare workers, visitors of the hospital including patients. Various terms are used in relation to the hospital waste like "medical waste", regulated medical waste" or "hospital waste". In hospital waste management, the popular term is bio-medical waste. "Bio-medical waste is defined as waste that is generated during the diagnosis, treatment or immunization of human beings and are contaminated with patients' body fluids, such as syringes, needles, ampoules, organs and body parts, placenta, dressings, disposables plastics and microbiological wastes". India generates around 3m tones of medical wastes every year. This medical waste need to be disposed off effectively.

Before we study the classification and disposal of hospital waste, let us first try to understand the meaning of some of the terminologies used in hospital waste management.

Fig.3.5 Bio- Medical Waste

Fig.3.6 symbol Biohazards

(a) **Bio-Medical Waste:** It is "any solid, fluid or liquid waste, including its container and any intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals".

(b) **Medical Waste:** It is all waste materials generated at healthcare facilities, such as hospitals, clinics, physicians office, dental practices, blood banks and veterinary hospital/clinics as well as medical research facilities.

(c) **Clinical Waste:** Is defined as "any waste coming out of medical care provided in hospitals or other medical care establishments, but does not include waste generated at home."

Fig.3.7 Harmful Waste

(d) **Hospital Waste:** It refers to all waste, biological or non-biological that is generated from a hospital, and is not intended for further use.

(e) **Pathological Waste:** It is defined as "waste removed during surgery/autopsy or other medical procedures including human tissues, organ, body parts, body fluids and specimens along with their containers."

(f) **Infectious Waste:** It refers to that portion of bio-medical waste which may

transmit viral, bacterial or parasitic diseases, if concentration and virulence of pathogenic organisms is sufficiently high.

(g) **Hazardous Waste:** It refers to that portion of Bio-Medical Waste which has a potential to cause hazards to health and life of human beings.

(h) **Radioactive Waste:** It includes waste contaminated with radionuclide's, it may be solid, liquid or gaseous waste. These are generated from in-vitro analysis of body fluids and tissues, in-vitro imaging and other therapeutic procedures.

Fig.3.8 Radioactive

(i) **Pressurized Waste:** It include compressed gas cylinders, aerosol cans and disposable compressed gas containers.

(j) **General Waste:** It includes general domestic type waste from offices, public areas, stores, catering areas, comprising of newspapers, letters, documents, card board containers, metal cans, floor sweepings and also includes kitchen waste.

(k) **Recyclable Waste:** It includes glass after cleaning and disinfection, paper, corrugated cardboard, aluminium, X-ray film, reclaimed silver from X-ray developing solution, Plastics after disinfection n and shredding.

Classification of Hospital Waste

The World Health Organization (WHO) has classified the hospital waste into the following categories:

1. General Waste: The waste generated from office, administrative offices, kitchen, laundry and stores.
2. Sharps: Hypodermic needles, needles attached to tubing, scalpel blades, razor, nails, broken glass pieces, etc.
3. Infected waste: Equipment and instruments used for diagnostic and therapeutic procedures, waste from surgery like tissues and organs removed and autopsy.
4. Chemical waste: Formaldehyde used for preserving tissues and organs, fix used in radiology department xylene acetone, ethanol and menthanol.
5. Radioactive waste: Various radioactive wastes generated through the activities of the department like research activity, clinical laboratory and nuclear medicine department
6. Cytotoxic drugs: Various anti-cancer drugs.

Fig.3.9 Hospital Waste

Categories of Biomedical Waste

TheMinistryofEnvironmentandForestshasdraftedcertainrulesinexerciseofpowersconferredby section6,8 and 25of the Environmental ProtectionAct1986.

The categories of bio-medical wastes, as per the Biomedical Waste (Management and Handling) Rules 1988 are as follows:

Waste Category	**Waste class and description**
CategoryNo.1	**Human anatomical wastes**
CategoryNo.2	Animal wastes (animal tissues ,organs, body parts, bleeding parts, Fluid blood and experimental animals used in research, waste generated by veterinaryhospitals,colleges,dischargefromhospitals,animalhouses).
CategoryNo.3	**Microbiology and biotechnology wastes** (Wastes from laboratory culture, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research and infections agents from research and industrial laboratories, wastes from production of biological toxins, dishes and devices used for transfe rof cultures).
CategoryNo.4	**Waste sharp** Needles, syringes, scalpels, blades, glass, etc. That is capable of causing puncture and cuts. This includes both used and unused sharps.
CategoryNo.5	**Discarded medicines and cytotoxic drugs** Wastes comprising of outdated, contaminated and discarded medicines.
CategoryNo.6	Solid Waste Items contained with blood, and body fluids including cotton, dressing, soiled plaster casts, linen, beddings, and other materials contaminated with blood.

CategoryNo.7	**Solid waste** Wastes generated from disposable items other than the waste sharps, such as tubing's, catheters, intravenous sets.
CategoryNo.8	**Liquid Waste** Wastes generated from laboratory and washing ,cleaning house keeping and disinfection activities
CategoryNo.9	**Incineration ash** Ash from incineration of any biomedical waste.
CategoryNo.10	**Chemical waste** Chemicals used in the production of biological, chemicals used in disinfections, as insecticides.

Importance of Hospital Waste

The hospital waste is important from the following point of view:

The staff working in the hospitals is directly exposed to the risks of the hospital wastes. The implications of the hospital waste in relation to the hospital staff can be emphasize don the basis of following points:

(i) The hospital staff is responsible for generating, segregating, collecting, storing, treating of the hospital waste.

(ii) The healthcare worker by virtue of their profession has to work with sharps like needle, blades, etc. and they are at risk of contracting that infection. There is risk of transmission of HIV/AIDS, and Hepatitis B and C.

(iii) The hospital authorities must organize teaching and training programmes for the healthcare workers and the hospital authorities must provide the adequate quantity of gloves, masks, foot wears, goggles, gum boots, gowns.

The hospital is visited by the patients for treatment and the patients are accompanied by close associates, maybe friends or relatives, who prefer to stay with patients for their company and to take care of the non-medical needs. In addition to the attendants of the patients, a large number of visitors also visit the hospital.

Fig.3.10 collect clinical waste

A large number of people are involved in collection of the hospital waste like the ragpickers, who are interested in the polythene bags, plastic wares, used disposable syringes and needles. In all these cases the ragpickers are exposed to risk of transmission of diseases which are of very serious nature like HIV/AIDS,HBV/HCV infections. It is the responsibility of the hospital administration to safe guard the interest of the general public. Some hospitals throw hospital waste, removed tissues and organs, amputated waste and removed fetuses in to the general waste. This issue invites the attention of the public health authorities.

Fig.3.11 Bio medical waste Polythene Bags

The internal environment of the hospital has got direct communication with the outside environment. The gases and heat generated inside the hospitals are exhausted in to the external environment. The internal environment of the hospital is contaminated with bacteria, viruses and parasites, which can pose a threat of spreading infection to the out side environment. The foul gases from mortuary or foul smelling discharges from the labour room, pathology department, anatomy department are discharged directly to the outside environment, which are responsible for the environmental pollution. All such activities have invited attention of the environmentalists and the Government has enacted laws to protect the health of the people and also to safeguard the environment.

Nosocomial infections: Nosocomial infections are infections that have been caught in a hospital and are potentially caused by organisms that are resistant to antibiotics. It is the infection that was not present or incubating prior to the patient's being admitted to the hospital, but occurs within 72 hours after admittance to the hospital. The sources of hospital acquired infection are as follows:

a) Patient sown flora
b) Flora of another patients
c) Fomites-any object or substance capable of carrying infectious organisms.
d) Environmental sources
e) Contamination by patients, attendants, visitors and hospital staff.

Fig.3.12 Industrial waste water

The routes of transmission of infection can be:

a) Aerial route for example, through inhalation of hospital dust.
b) Direct contact for example, through abrasions on skin, or through mucous membrane.
c) Faeco–oral route for example, through ingestion of food, water with contaminated hands
d) Parenteral route during the process of injections and infusions.
e) Through equipment and materials.

Activities

Activity 1: Visit a near by hospital. Wear personal protection equipment and identify the different wastes. Classify them according to the category number and fill the table given below:

Waste Category	Waste
CategoryNo.1	
CategoryNo.2	
CategoryNo.3	
CategoryNo.4	
CategoryNo.5	
CategoryNo.6	
CategoryNo.7	
CategoryNo.8	
CategoryNo.9	
CategoryNo.10	

Check Your Progress

A. Multiple Choice Questions

1. The bio-medical waste should be properly discarded because it has –
   a) The potential to transmit diseases
   b) Radioactive properties
   c) Good decaying materials
   d) All the above
2. WHO has classified hospital waste into general, infected, chemical, radioactive, _____ and _____.
   a) General waste
   b) Sharp
   c) Cytotoxic drugs
   d) b and c
3. Bio-medical waste is the waste generated during the diagnosis, treatment or immunization of human beings and that are contaminated by –
   a) Soil
   b) Rain water
   c) Chemicals

d) Patient's body fluids

4. The routes of transmission of nosocomial infections are –
   a) Aevial route
   b) Direct contact
   c) Faeco-oral route
   d) Parenteral route
   e) All the above
5. Nosocomial sources of infection are the patient's or other patient's flora, fomites, environmental sources or _____
   a) Contamination by patient's, visitors and hospital staff
   b) Developmental disorder
   c) Road traffic accidents
   d) All the above

B. Short Answer Questions.

1. Define Bio-medical waste?

   _____
   __

   _____

2. Enlist the risks involved in poor waste management in hospital.
   _____
   _____
   _____
3. How bio-medical waste management helps in environment protection?
   _____
   _____
   _____
4. Describe the importance of bio-medical waste management
   _____
   _____
   _____
5. What is nosocomial infection?
   _____
   _____
   _____

Session 3: Sources and Disposal of Bio-medical Waste

Sources of bio-medical waste

Biomedical waste is generated from biological and medical sources and activities in hospitals, clinics, healthcare organizations, veterinary hospitals, etc. let us now try to identify the various generators of biomedical wastes. The sources can be classified as major and minor source, depending upon the amount of waste generated.

Hospital

- Hospitals of all category like general, specialist hospitals, private as well as

public sector hospitals generate biomedical wastes.

- Departments like Surgery, Gynecology and Obstetrics, Pediatrics, Oncology, orthopedics, Ophthalmology, ENT, Physical Medicine and Rehabilitation, Emergency Services, Operation Theatres, ICU, Critical Care Medicine, Burns and trauma, Neurosurgery etc. generate specific type of biomedical wastes.

Fig.3.13 Sterilization Machine

Clinics

- Physicians, Dentists, Maternity clinics, Immunization Clinics, Dialysis centres and endoscopy.
- Dispensaries of state or central governments

Healthcare organizations

- Polyclinics
- Nursing homes
- Geriatric homes
- Home for mentally retarded
- Mental asylums

Support Services

- Blood banks, pharmacy, mortuary, laundry, Laboratories

Veterinary Hospitals

Disposal of Wastes

Biomedical waste should not be mixed with other wastes for disposal. It should be treated and disposed of in accordance with schedule I, and in compliance with the standards prescribed in schedule V of the notification of Bio Medical Waste (BMW) rule (1998) of Ministry of Environment & Forest, Govt. of India. Once the waste shave been treated by one or the other method it is to be finally disposed of in the following manner:

- **Disposal of general/ non-hazardous waste**: It is done in the following methods:
  a. For small quantity
     i. Landfill: it is done by
        1. Trench method
        2. Ramp method
        3. Area method
     ii. Use of pits
     iii. Composting
  b. For large quantity
     i. NADEP composting

ii. Pelletisation technology
iii.Biopress and manure
iv.Pyrolysis

- **Disposal of waste water and liquid waste**: The liquid waste is disposed of by any of the following manner
  (i) Discharge in to the sewers
  (ii) Soak pits
  (iii) Waste stabilizing ponds.

- **Disposal of human anatomical, blood and body fluids**: the preferred method is by incineration.

- Disposal of sharps: the needles should be destroyed by the needle destroyers and other sharps as well as the needles should be bleach. The used syringes can be disposed of by melting and sterilizationatover250^{o}C.

- **Disposal of microbiological and bio-technological wastes**: This is done by autoclaving hydroclaving, microwave or incineration.

- **Disposal of pharmaceutical wastes**: The preferred method is by incineration and the ash can be disposed of by land filling.

- **Disposal of infectious solid waste**: it is first treated and converted to non–hazardous waste which is then disposed of as general waste.

- **Disposal of chemical waste**: Non-hazardous waste is disposed of as general waste and the hazardous waste is first converted into non–hazardous waste and then disposed of as general waste.

- **Disposal of radioactive wastes**: This is done in accordance with the guidelines issued by the Bhaba Atomic Research Centre(BARC).

- **Disposal of pressurized containers**: This is disposed of with general waste in special landfills. All records should be subjected to inspection and verification by the prescribed authority at any time. The authorized person shall maintain records related to generation collection, reception, storage, transportation, treatment disposal and/or any form of handling of bio-medical waste. No untreated bio-medical waste should be kept beyond a period of 48 hours.

Activities

Activity 1: Visit a nearby hospital and study the methods/techniques of disposing the bio-medical waste: Fill in the method(s) used for disposal of wastes.

Waste	Methods/techniques adopted
General/non-hazardous waste	

Waste water and liquid waste	
Human anatomical, blood and body fluids	
Sharps	
Microbiological and bio-technological wastes	
Pharmaceutical wastes	
Infectious solid waste	
Chemical waste	
Radioactive wastes	
Pressurized containers	

Activity 2: Visit a nearby hospital and identify the various types and sources of bio-medical wastes.

Name of waste	**Department generating such waste**
Needle	
Human Organs/tissues	
Plastic materials	
Infectious dressing pad	

Check Your Progress

A. Multiple Choice Questions

1. The disposal method of human anatomical, blood and body fluids is by –
   a) Landfill
   b) French method
   c) Incineration
   d) All the these
2. Disposal of general non-hazardous waste for small quantity are done by which of the following methods -
   a) Landfill
   b) Use of pits
   c) Composting
   All the above
3. The disposal of radioactive waste is done in accordance with the guidelines issued by –
   a) Atomic Council of India
   b) Bhaba Atomic Research Centre
   c) Chemical Society of India
   d) None of these
4. Bio-medical waste disposal guidelines standards are prescribed in schedule V of the Bio-medical waste rule of –
   a) Ministry of Health & Family Welfare
   b) Ministry of Environment & Forest
   c) Niti Aayog

d) All the above

B. Short Answer Questions

1. Enlist the sources of bio-medical waste

_____
_____
_____
_____

2. Describe the method of disposing of microbiological wastes in hospitals.

_____
_____
_____
_____

Session 4: Segregation and Transportation of Bio-Medical Waste

The following points should be remembered while segregating, packaging, transportation and storage of biomedical wastes:

1. Biomedical waste shall not be mixed with other wastes.
2. Biomedical waste shall be segregated in to containers/bags at the point of generation in accordance with Schedule II of BMW Management rules (1998) prior to its storage, transportation, treatment and disposal. The containers shall be labeled according to schedule III of the rules.
3. If a container is transported from the premises where biomedical waste is generated to any waste treatment facility out side the premises, the container shall, apart from the label prescribed in Schedule III, also carry information prescribed in Schedule IV.
4. Not with standing anything contained in the Motor Vehicles Act,1988, or rules there under, untreated biomedical waste shall be transported only in such vehicle as may be authorized for the purpose by the competent authority as specified by the government.
5. No untreated biomedical waste shall be kept stored beyond a period of 48 hours. Provided that if for any reason it becomes inevitable to store beyond 48 hours, the authorized person must take permission of the prescribed authority and take measures to ensure that the waste does not adversely affect human health and environment.

Fig.3.14 Transportation Bio Medical waste

Color Coding and Type of Containers for Bio-medical Wastes

Color coding as recommended for developing countries by WHO.

S.N.	Category of Waste	Recommended colour code
1	General non- hazardous waste	Black bag
2	Sharps (whether infected or not)	Yellow bag
3	Infected waste (Not containing sharps)	Yellow bag
4	Chemicaland pharmaceuticals (other than Cytotoxic drugs, radioactive waste, high pressure containers)	Red bag
5	Clinical waste that requires autoclaving	Bluebag

Types and Colour of Containers for disposal of biomedical waste (as per Ministry of Environment and Forest Guidelines)

Waste Category	Waste Class	Type of container	Colour code
CategoryNo.1	Human anatomical waste	Plastic Bag	Yellow
CategoryNo.2	Animal waste	Plastic Bag	Yellow
CategoryNo.3	Microbiological and Biotechnological waste	Plastic Bag/ Disinfected container	Yellow/ Red
CategoryNo.4	Sharp	Plastic Bag	Blue/White Translucent
CategoryNo.5	Discarded medicines and Cytotoxic drugs	Plastic Bag	Black
CategoryNo.6	Solid waste	Disinfected container /plastic bag	Yellow/ Red
CategoryNo.7	Solid Waste	Disinfected containers/plastic bag/puncture proof containers	Red/blue / White
CategoryNo.8	Liquid waste	Not Applicable	Not Applicable
CategoryNo.9	Incineration Ash	Plastic Bag	Black
CategoryNo.10	Chemical Waste	Plastic Bag for solid	Black

Fig.3.15 Colour of Containers (bag) for disposal of biomedical waste

Transportation of Biomedical Wastes

Transportation of bio-medical wastes can be divided into intramural(internal) and extramural(external)transportation.

Intramural (internal) transport

The sanitation staff room the centralized gang shall be responsible for transporting the different coloured polythene bags in garbage bins from the sluice room, nursing station and treatment room of each ward. Push carts and garbage trollies designed for the purpose should only be used. From all the floors and wings, the waste shall be taken through main ramp in covered trollies to the ground floor and from there to the area near the incinerator/mortuary. The general waste (in black polythene bags) should be deposited at the municipal dumps, opposite he mortuary, adjacent to the incinerator site. Any spillage or leakage should be reported to Sanitation Inspector Incharge, and it is his/her responsibility to get the respective trolleys/carts cleaned and disinfected.

Extramural (external) transport – Only general waste collected in the black coloured plastic bags shall be transported in the vehicle by the Municipality authorities. The request shall be made by the hospital authorities to the Municipal authorities to send the vehicle once in day without any failure.

Fig.3.16 Collect Hospital waste

Treatment and Disposal of Hospital Waste

1. **Civic Authorities:** Most of the waste (about80%90%) generated in the hospital is general waste, which is similar to the waste generated in house and offices. This waste is non-toxic and non- infectious, and comprises of paper, leftover

food articles, peels of fruits, disposable and paper containers for tea/coffee etc., cardboards boxes, outer cover or wrapping of disposable items, etc. These general wastes should be put in to black coloured polythene bags and are deposited at the municipal dump opposite to the mortuary. It is subsequently collected by the local municipal authorities for disposal every day. The Sanitation Officer is responsible for proper co-ordination between municipal authorities. However, it is the responsibility of the hospital security (Police/contractor)to ensure that ragpickers are not allowed entry in to the dumps.

2. **Incineration:** The waste collected in yellow coloured bags is transported to the site of incineration, adjacent to the generator room. The incinerator is maintained on contract basis by the Engineering services department and is manned by a supervisor and workers. After the waste (in yellow coloured bags) is deposited in the custody of the supervisor, the sanitation staff should obtain a proper receipt, and the entire process should be documented. It is the responsibility of the supervisor to ensure that ragpickers and other unwanted elements do not rumm age through the waste for re-using of disposables and plastics. The functioning of the incinerator and the number of cycles operated per day should be documented in a logbook. Regular monitoring of the process should be carried out by the engineers as per Pollution Control Board norms and feedback provided to officer incharge. The ash produced by incineration should be sent for secure land filling.

3. **Autoclaving and Shredding:** Once the autoclave facility is installed in the hospital, the waste collected in blue bags shall be transported to the site of autoclaving and shredding for treatment. The process of deposition of the waste for autoclaving and shredding shall also be documented and a register shall be maintained for the same. The supervisor shall ensure that ragpickers and other unwanted persons do not gain access to the waste stored there, prior to autoclaving and shredding. The functioning of the autoclave and shredder including the number of cycles per day shall be maintained in a log table and periodically monitored by engineers as per norms.

4. **Radioactive Waste:** Radioactive wastes are generated during the process of body organ imaging, tumour localization and therapeutic processes in Radiotherapy Department. These applications of radioactive materials generate some solid radioactive waste i.e. vials, syringes, absorbent paper, protective clothing, etc. Concentration and storage under strict supervision in a large drum/container till it has decayed is principally used. The radioactive material in liquid form (include in g patient's urine) are generally diluted and dispersed in the sewers. Gaseous radioactive waste can be diluted through dispersal in the outside atmosphere. Under normal circumstances, urine and faeces can be handled as non-radioactive waste so long as the room is routinely monitored or radioactive contamination.

5. **Liquid and Chemical Wastes:** These wastes should be disinfected by chemical treatment using at least1%sodiumhypochlorite solution and then discharged

into drains/sewers where it is taken care of by the principle of dilution and dispersal. The responsibility for proper disposal of liquid wastes lies with the sanitation.

Supervisor in case of weekly "gang" cleaning of indoor patient care areas; and with the nursing staff in case of routine cleaning. Responsibility of chemical waste should be with the persons/staff using the chemicals and generating the waste.

Activities

1. Visit a near by hospital and observe the segregation process of bio-medical waste. Do not forget to wear personal protective equipment. Identify the type of bio-medical waste and fill the table given below:

Type of bio-Medical waste	Class of waste	Type of container	Waste category no.	Colour code

2. **Fill the colour code in blank boxes for the following types of waste:**

	Waste	Colour Code
1	General non hazardous waste	
2	Sharps	
3	Infected waste	
4	Chemicals	
5	Human anatomical waste	

Check Your Progress

A. Multiple Choice Questions

1. Transportation of Bio-medical waste can be divided into _____ and _____ Transportation.
   a) Extramural & Intramural
   b) Yellow & red
   c) Autoclaving & shredding
   d) None of these

2. Colour coding for clinical waste that requires autoclaving is –
   a) Black bag
   b) Yellow bag
   c) Red bag
   d) Blue bag
3. _____ is in charge of the coordination of waste disposal between the hospital and muncipal authorities.
   a) Waste officer
   b) Sanitation officer
   c) Disposal officer
   d) None of these

B. Short Answer Questions

1. How bio-medical waste is treated in a hospital?
   _____
   _____
   _____
2. How general waste is disposed of by hospital?
   _____
   _____
   _____
3. Transportation of bio-medical waste?
   _____
   _____

Session 5: Role of Hospital Staff in Bio-medical Waste Management

(A) Role of Medical Superintendent

The overall responsibility of Medical Superintendent is to implement the guidelines for hospital waste management and ensure that waste is handled without any adverse effect to human health and environment. He/she is responsible for submitting an annual report on biomedical waste management. He is answerable to the higher authorities regarding implementation of biomedical waste management policy.

(B) Functions of Hospital Waste Management Committee

1. To ensure the circulation of copies of Bio-medical Waste Rules and guidelines in Departments.
2. To conduct awareness programmes regarding bio-medical waste management.
3. To conduct training programmes for Medical Professionals, Nursing Professionals, Home Health Aide and other staff on biomedical waste management.
4. To hold meeting of the Hospital Waste Management Committee

And formulate a detailed plan of action in regard to segregation, collection,

storage and transport of waste.

5. To procure the items required in this regard and make them available.

Each Clinical Department (Unit), Lab Services, Blood Bank, Microbiology, Pathology shall make one Faculty Member responsible for supervision of segregation of biomedical waste in their area of activities. Floor wise nurses / GDA are responsible for supervision of segregation in the wards of each floor. In each and every OT one Incharge is responsible for segregation of waste.

(C) Role of Officer Incharge of Waste Management

The Officer Incharge of Bio-medical Waste Management liaise with the Heads of Departments, Infection Control Officer and Matron. He is the member of the Hospital Waste Management Committee. He is responsible for monitoring the programme from time to time at various levels i.e. generation, segregation, collection, storage, transportation and treatment (including disposal). He is responsible for circulation of all policy decisions and the hospital waste management manual. He is responsible for accident reporting in Form III to the prescribed authority.

Fig.3.14 Hospital waste management

(D)Role of Heads/Incharge of Labs/Units/Departments

They are responsible for the formulation and implementation of waste management procedures for their departments which should be done in conformity with the general guidelines issued by the administration. They shall also be responsible for getting all staff, doctors, nurses, paramedics and group-D staff trained in hospital waste management, and shall liaise with the Officer Incharge of bio-medical waste management for administrative support. With regard to the departments which generate radioactive waste, one of the consultants should be designated as Radiation Protection Officer and he/she shall be responsible for implementation of necessary guidelines.

(E)Role of Matron/Nursing Superintendent

The Matron shall designate one of the senior administrative level deputies as Sister In-charge of Hospital Waste Management, who shall be responsible for close monitoring of the activity. She shall conduct surprise rounds and shall review and evaluate the various aspects of scientific hospital waste management at all levels from generation and segregation to final disposal. She shall also attend the

meetings of Hospital Waste Management Committee on behalf of the Matron and co-ordinate the training of nurses on Hospital Waste Management with administration.

(F) Role of I/c Sanitation Inspector

The In-charge Sanitation Inspector is responsible for the implementation, monitoring and evaluation of hospital waste management from collection and storage of hospital waste to its final disposal. He/she attend the Hospital Waste Management Committee meetings and ensure the training of the staff. Regular in-service training and evaluation of the sanitation attendants carried out by him/her. He/she shall also provide feedback information to Officer In-charge Waste Management incase of accidents and spills.

Training on Hospital Waste Management

In order to be able to comprehend and implement the Bio-Medical Waste Management, it Is mandatory to provide training to all categories of staff i.e. resident doctors, nurses, paramedical staff, GDA, attendants, canteen staff, etc. Before the training is carried out, the training needs are to be identified and the content of the training programme should be contextual is. It should be interactive and should include awareness sessions, demonstrations and behavioral science in puts .It should include the following:

- Awareness of different categories of waste and potential hazard
- Waste minimization, reduction in use of disposables
- Segregation policy
- Proper and safe handling of sharps
- Use of protective gear
- Colour coding of containers
- Appropriate treatment of waste
- Management of spills and accidents
- Occupational health and safety

Activities

Activity 1: Visit a nearby hospital and observe the duties performed by health personnel in bio- medical waste management.

Check Your Progress

A. Fill in the Blanks

1. Role of _____ is to implement guidelines for hospital waste management.
2. _____ maintains liaise with the heads of departments, infection control officer and matron.

3. _____ committee ensure Bio-medical waste management of a hospital.

B. Short Answer Questions

1. Write the functions of hospital waste management committee.

_____
_____
_____
_____

2. State any two responsibilities of medical superintendent regarding biomedical waste management.

_____
_____
_____
_____

3. Describe the role of THSC in hospital waste management.

_____
_____
_____
_____

Module 4 Telehealth Facility and Health Record

Introduction

Telehealth has revolutionized the delivery of healthcare by enabling remote consultations and monitoring through various technologies. The effective setup and operation of a telehealth facility hinge on selecting appropriate equipment, understanding supporting tools and resources, and adhering to regulatory requirements. Ensuring the safe and correct use of telehealth equipment is crucial for maintaining high standards of care and protecting patient information. Furthermore, compliance with laws, regulations, and codes related to technology and technical safety is essential to uphold legal and ethical standards in telehealth practice. This introduction will outline the key components of telehealth infrastructure, the necessary supporting elements, and the regulatory landscape that governs their use.

Learning Outcomes

After completing this module, you will be able to:

- Identify Telehealth equipment and applications required to be set-up in Telehealth facility
- Identify the supporting tools, resources and regulatory requirements for selected equipment and technology

- Discuss about the operate tele health equipment safely and correctly.
- Explain laws, regulation and codes for technology and technical safety

Module Structure

Session 1: Record and Report

Session 1: Record and Report

Introduction to Telehealth Records

Telehealth records, also known as electronic health records (EHR) or telemedicine records, are digital versions of patients' health information. They go beyond the traditional paper records, embracing the wonders of technology to improve healthcare delivery. These records capture a comprehensive view of a patient's medical history, diagnoses, medications, treatment plans, immunization dates, allergies, radiology images, and laboratory test results.

Fig.4.1 Digital Data Record

Types of Telehealth Records

Electronic Health Records (EHR): EHRs are comprehensive digital records that include a patient's medical history from multiple healthcare providers.

They provide real-time information, allowing healthcare professionals to make informed decisions quickly. The data is accessible securely by authorized personnel, ensuring efficient and coordinated care.

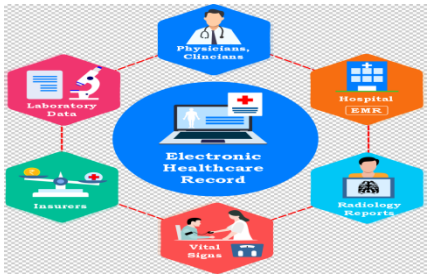

Fig.4.2 Electronic health record

Personal Health Records (PHR):PHRs are controlled by patients, allowing them

to manage their health information independently. Patients can input data, track their health metrics, and share information with healthcare providers as needed.It empowers individuals to take an active role in managing their well-being.

Telemedicine Records: These records specifically focus on information related to Telehealth encounters. They include details of virtual consultations, remote monitoring data, and any communication exchanged during telemedicine sessions. Telemedicine records contribute to the continuity of care in a remote setting.

Health Information Exchanges (HIE): HIEs facilitate the exchange of health information between different healthcare organizations. They promote interoperability, enabling seamless sharing of patient data across different systems and platforms. HIEs play a crucial role in ensuring that healthcare providers have access to a patient's complete medical history.

Mobile Health (m-Health) Records: With the rise of mobile applications, m-Health records are becoming increasingly popular. These records may include data from fitness trackers, health apps, ABHA app, eSanjeevani, Ayushman Bharat application and wearable devices. Integrating m-Health records with traditional EHRs provides a more holistic view of a patient's lifestyle and health habits. In a nutshell, tele-health records are the backbone of modern healthcare, fostering collaboration, efficiency, and patient-centric care. They bridge the gap between healthcare providers and patients, ensuring that information flows seamlessly, even in the digital realm.

Data collection and storage

Data collection and storage is the second component of a telemedicine system. This is typically implemented in a service provider or clinical care setting. This element automatically collects data and stores it in a secure password protected online server. The server may be located either on the hospital premises or in a device-related data repository accessible by health care professionals. In recent times privacy, security and hosting sovereignty principles have often been adhered to, for example, compliance with regulations such as the Health Insurance Portability and Accountability Act. Once the data is stored in the central repository, the system can send email, SMS or fax alerts to healthcare providers regarding the availability of the data.

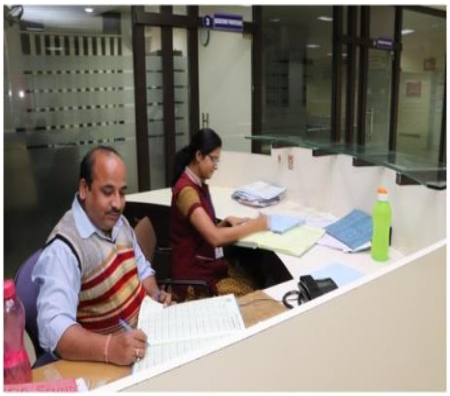

Fig.4.3 Data collection & storage

1. Collect client past and present health history -

Past History

Medical History:
- Chronic illnesses (diabetes, hypertension, etc.)
- Previous surgeries or hospitalizations.
- Allergies to medications or any adverse reactions.

Family History:
- Hereditary conditions or diseases among close relatives.
- Any patterns of illnesses in the family tree.

Social History:
- Lifestyle habits (smoking, alcohol consumption, physical activity).
- Occupation and workplace-related exposures.
- Dietary habits and nutrition.

Reproductive History:
- For women: Pregnancy history, menstrual history, contraceptive use.
- For men: Reproductive health concerns.

Psychosocial History:
- History of mental health issues.
- Life events affecting mental and emotional well-being.

Present History

Chief Complaint:
- The main reason for seeking healthcare.
- Symptoms, their onset, duration, and severity.

Medical History:
- Current medications, including over-the-counter and supplements.
- Any recent illnesses or injuries.

Family History:
- Updates on any changes or developments in family health.

Social History:
- Any recent lifestyle changes.
- Updates on occupation and potential exposures.

Review of Systems:
- A systematic inquiry into symptoms related to each organ system.
- Helps uncover symptoms that might not be directly related to the chief complaint.

Psychosocial History:
- Current stressors or life events impacting mental health.
- Changes in mood, sleep patterns, or energy levels.

Allergies:
- Any new allergies or reactions.

Medication Adherence:

- Ask about the adherence to prescribed medications.

Sources of Client Data collection

Patient Interviews:

- Conducting face-to-face or virtual interviews with the client to gather information.
- Structured and open-ended questions can be used to cover various aspects of their health history.

Medical Records:

- Reviewing existing medical records, including electronic health records (EHRs) and paper records.
- Previous diagnoses, treatments, and test results can provide valuable insights.

Family Members:

- Gathering information from close family members, especially for patients who may have difficulty providing their own history.
- Family members may offer insights into hereditary conditions.

Caregivers and Support Personnel:

- For clients with special needs or those unable to communicate effectively, caregivers can provide crucial information.

Observation:

- Direct observation of the client's physical appearance, behavior, and any visible symptoms.
- This is particularly important in clinical settings.

Laboratory and Diagnostic Tests:

- Results of blood tests, imaging studies, and other diagnostic procedures.
- These provide objective data about the client's current health status.

Pharmacy Records:

- Checking prescription records to understand current and past medications.
- Helps in assessing medication adherence and potential interactions.

Methods of Client Data Collection

Surveys and Questionnaires:

- Distributing written or digital surveys to gather specific information.
- Useful for collecting data on lifestyle, habits, and subjective experiences.

Structured Interviews:

- Conducting interviews with a set of predetermined questions.
- Ensures consistency in data collection.

Focus Groups:

- Bringing together a small group of clients to discuss specific topics.
- Provides a more dynamic and interactive way to collect information.

Telehealth and Remote Monitoring:

- Leveraging technology for virtual consultations and remote monitoring of health metrics.
- Especially useful for clients in remote locations or those with mobility issues.

Medical Examinations:

- Physical examinations conducted by healthcare professionals.
- Hands-on assessment of vital signs, organ systems, and overall health.

Cognitive and Mental Health Assessments:

- Using standardized tools to assess cognitive function and mental health.
- Particularly important in understanding conditions like dementia or mood disorders.

Health Surveys and Apps:

- Encouraging clients to use health apps or participate in health surveys.
- This can provide real-time data on lifestyle and health behaviors.

Verbal, written and electronically records

Verbal health records usually involve direct communication between healthcare professionals. They discuss a patient's medical history, current symptoms, and treatment plans verbally, often during consultations or handovers.

Written health records are the traditional paper-based records or, more commonly now, electronic records. These documents include patient histories, test results, diagnoses, treatment plans, and other essential information. They provide a comprehensive view of a patient's health journey and are crucial for continuity of care.

Electronic health records (EHRs) are digitized versions of written records. They streamline information sharing among healthcare providers, improve accuracy, and enhance patient care coordination. EHRs often include features like automated alerts, prescription tracking, and secure patient portals for communication.

All three types play a vital role in maintaining and improving patient care, each with its own advantages and challenges. The shift towards electronic records reflects the growing need for efficient, accessible, and secure health information management.

Health records involve various forms and registers to comprehensively document and manage a patient's information. Here's a list of some common forms and registers found in health records:

Fig.4.4 Electronic Record

- **Patient Registration Form:** Captures basic demographic details and contact information.
- **Medical History Form:** Documents a patient's past illnesses, surgeries, and family medical history.
- **Patient Consent Form:** Obtained to allow healthcare providers to carry out specific treatments or procedures.
- **Medication Record Form:** Lists all medications prescribed, including dosage and frequency.
- **Allergy Record Form:** Documents any known allergies or adverse reactions to medications.
- **Vital Signs Chart:** Records vital signs such as blood pressure, heart rate, respiratory rate, and temperature.
- **Progress Notes:** Regularly updated notes by healthcare professionals documenting patient progress and any changes in treatment plans
- **Diagnostic Test Results Form:** Records results from various diagnostic tests, such as blood tests, imaging studies, etc.
- **Treatment Plan Form:** Outlines the course of treatment, including medications, therapies, and follow-up appointments.
- **Discharge Summary Form:** Provides a summary of a patient's stay in a healthcare facility, including diagnoses, treatments, and recommendations for post-discharge care.
- **Surgical Consent Form:** Obtained before surgical procedures, outlining the risks and benefits of the surgery.
- **Incident Report Form:** Documents any unexpected events, accidents, or incidents that occur during a patient's care.
- **Billing and Insurance Forms:** Capture information related to billing, insurance coverage, and financial aspects of healthcare services.
- **Immunization Record Form:** Tracks vaccinations and immunization history.
- **Referral Form:** Used when a patient is referred to a specialist or another healthcare provider.
- **Mental Health Assessment Form:** Documents information related to a patient's mental health, including symptoms, history, and assessments.
- **Labor and Delivery Record:** Documents details related to pregnancy, labor, and delivery for obstetric patients.
- **Nursing Care Plan:** Outlines the specific care and interventions planned for a patient by nursing staff.
- **Informed Consent Form:** Ensures that patients are fully informed about the risks and benefits of a particular treatment or procedure before giving consent.
- **Patient Feedback Form:** Allows patients to provide feedback on their experience and the quality of care received.

Inventory management, documentation, and handling incoming calls are important aspects of Telehealth services.

1. Inventory Management

- Digital Equipment Inventory: Keep track of Telehealth devices, such as webcams, microphones, and other peripherals.
- Software Inventory: Manage licenses and versions of Telehealth

platforms and software used for consultations.

- Supply Inventory: Track consumables like gloves, masks, or any physical supplies sent to patients.
- Device Maintenance Records: Schedule and document regular maintenance or updates for Telehealth equipment.

Fig.4.5 inventory Management

2. Incoming Calls

- Call Log: Maintain a detailed log of incoming calls, including date, time, patient information, and purpose of the call.
- Appointment Scheduling: Use scheduling tools to efficiently manage virtual appointments and avoid overlaps.
- Emergency Protocols: Establish protocols for handling urgent or emergency calls and ensure staff is trained accordingly.
- Call Analytics: Analyze call data to identify trends, assess call volume, and optimize resource allocation.

Fig.4.6 Records in Telehealth services

3. Documentation

- Electronic Health Records (EHR): Ensure that all Telehealth consultations are documented in the EHR system, including symptoms discussed, prescriptions, and treatment plans.
- Consent Forms: Document patient consent for Telehealth services, outlining the risks, benefits, and limitations.
- Compliance Documentation: Keep records to demonstrate compliance with Telehealth regulations and standards.
- Quality Assurance Reports: Regularly review and document the quality of Telehealth interactions to identify areas for improvement.

4. Equipment Management

- Equipment Tracking System: Implement a system to monitor the location and status of Telehealth equipment.
- Troubleshooting Documentation: Create guides for basic troubleshooting of common Telehealth equipment issues.
- Equipment Training Records: Document staff training on the proper use of Telehealth equipment.
- Security Measures: Document security protocols for Telehealth equipment and communications to ensure patient privacy.

Importance of records in Tele health services

Health records play a important role in Telehealth care services for several reasons. First and foremost, they provide a comprehensive and accessible source of a patient's medical history, allowing healthcare providers to make informed decisions and provide better care. This is especially important in Telehealth, where the physical presence of the patient is not possible. Here are some key reasons why health records are essential in Telehealth.

Continuity of Care: Health records ensure continuity of care by providing a detailed account of the patient's medical history, including past illnesses, treatments, medications, and allergies. This information is vital for healthcare providers to understand the patient's overall health and make informed decisions about their current condition.

Diagnostic Support: Health records serve as a valuable tool for diagnostic support. In Telehealth, where direct physical examination may be limited, having access to a patient's medical history and test results helps healthcare providers assess symptoms, make accurate diagnoses, and recommend appropriate treatment plans.

Medication Management: Health records help in managing medications effectively. Telehealth providers can review a patient's medication history, identify potential drug interactions, and ensure that prescribed medications are appropriate for the patient's current health status.

Remote Monitoring: For patients with chronic conditions or those requiring ongoing monitoring, health records enable remote monitoring of vital signs and other health parameters. Telehealth platforms can integrate with devices that collect and transmit data, allowing healthcare providers to track and manage patients' health remotely.

Efficient Communication: Health records facilitate efficient communication between healthcare providers, even in a virtual setting. By accessing a patient's electronic health record, different members of the healthcare team can collaborate and share information seamlessly, leading to better-coordinated care.

Legal and Regulatory Compliance: Maintaining accurate and up-to-date health

records is essential for legal and regulatory compliance. Telehealth services must adhere to privacy and security regulations, and health records play a key role in ensuring the confidentiality of patient information.

Patient Engagement: Health records can also empower patients to actively participate in their healthcare. Providing patients with access to their own health records through secure portals allows them to review their medical history, understand their conditions, and engage more effectively with Telehealth providers.

Health records are a foundational element of Telehealth care services, supporting the delivery of high-quality, personalized care even in virtual settings. They contribute to better decision-making, continuity of care, and overall healthcare efficiency.

Activities

Activity 1: Visit a Tele Health Care Center and prepare a report on various types of Tele health records.
Activity 2: Visit a nearby hospital and prepare a list of some common forms and registers found in health records collect patient information.

Check Your Progress

A. Multiple Choice Questions

1. Telehealth records, also known as_____
2. Data collection and storage is the second component of a_____
3._____usually involve direct communication between healthcare professionals.
4. _____ help in managing medications effectively.

B. write the full form of following words

S.No	Word	Full Form
1.	PHR	
2.	EHR	
3.	HIE	
4.	m-Health	

C. Short Answer Questions

1. Define telemedicine record.
2. Write the types of Telehealth Records in Telehealth services.
3. Write the sources and methods of client's data collection.

D. Long Answer Questions

1. What is the importance of Telehealth records?
2. Explain important aspects of Telehealth services.
3. Differentiate between Verbal, written and electronically records.

Answers

Module 1: Health Care Services Provider

Session 1: Tele Diagnostic Services

A. Match the following

1-b,
2-a,
3-e,
4-c,
5-f,
6-d

Session 2: Introduction of Pharmacy and Emergencies Medicine

A. Match the following

1-b,
2-a,
3-d,
4-c

B. Fill in the Blanks

1. Drug,
2. health sciences
3. Medicine

Session 3: Forms and Routes of Medication

A. Multiple Choice Questions

1-b,
2-d

B. Match the following

1-f,
2-e,
3-b,
4-c,
5-d,
6-a,

C. Fill in the blanks

1-Anaphylaxis,
2-Nauseaandvomiting,
3- No Known Allergies

E. Mentioned whether the following statements are True or False

1-True,
2.False

Session 4: Classification of Drugs

A. Fill in the Blanks

1. Laxatives
2. Diuretics
3.Stomachpain

Module 2: Maintain a Safe, Healthy and Secure Working

Session 1: Safety, Emergency Medical Response and First Aid

A. Fill in the Blanks

1-White Cross,
2- plasma and cells,
3- 20,000

Session 2: Performing the Role of Telehealth care service coordinator in Fever, Heat, Stroke, Back Pain, Asthma, and Food Born Illness

A. Match the column

1-c,
2-e,
3-a,
4-b,
5-d

B. Fill in the Blanks

1- low fever,
2- cool,
3-Asthma
4- Pain
5-Fever

Session 3: Immunization

A. Fill in the Blanks

1- Vaccine,
2-Immunization,
3- Govt. of India, 1985,
4- Edward Jenner's

Session 4: Personal Hygiene Practices for Telehealth Services Coordinator

A. Fill in the Blank

1. good health
2. titivating and preening
3.positive self –image

B. Multiple Choice Questions

1-a,
2-d,
3-b

C. Match the part of body with hygiene practices

1-c,
2-d,
3-b,
4-a

Module 3: Infection control and Bio-Medical Waste Management

Session 1: Infection Control

A. Fill in the Blanks

1. Antiseptic
2. Cleaning
3. Sterilization

Session 2 : Bio-Medical Waste Management

A. Multiple Choice Questions

1-a,
2-d,
3-d,
4-e,
5-a

Session 3: Sources and Disposal of Bio-medical Waste

A. Multiple Choice Questions

1-c,
2-d,
3-b,
4-b

Session 4: Segregation and Transportation of Bio- Medical Waste

A. Multiple Choice Questions

1-a,
2-d,
3-b

Session 5: Role of Hospital Staff in Bio-medical Waste Management

A. Fill in the Blanks

1. Medical Superintend
2. Officer – In charge of bio-medical waste management
3. Hospital waste management committee

Module 4: Telehealth Facility and Health Record

Session 1 Record and Report

A. Multiple Choice Questions

1. Electronic health records
2. Telemedicine system
3. Verbal health records
4. Health records

B. Write the full form of following words

1. Personal Health Records
2. Electronic Health Records
3. Health Information Exchanges
4. Mobile Health Records

Glossary