General Duty Assistant

(Job Role)

Qualification Pack: Ref. Id. HSS/Q5101
Sector: Health Care

Textbook for Class XII

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NCERT

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Foreword

The *National Curriculum Framework* (NCF)–2005 recommends bringing work and education into the curricular domain, infusing it in all areas of learning while giving it an identity of its own at relevant stages. It explains that work transforms knowledge into experience, and generates important personal and social values, such as self-reliance, creativity and cooperation. Through work, one learns to find one's place in society. It is an educational activity with an inherent potential for inclusion. Therefore, an experience of involvement in productive work in an educational setting will make one appreciate the worth of social life and what is valued and appreciated in the society. Work involves interaction with material or other people (mostly both), thus, creating deeper comprehension and increased practical knowledge of natural substances and social relationships.

Through work and education, school knowledge can be easily linked with learners' life outside the school. This also makes a departure from the legacy of bookish learning, and bridges the gap between school, home, community and workplace. The NCF–2005 also emphasises Vocational Education and Training (VET) for all those children, who wish to acquire additional skills and/or seek livelihood through vocational education after either discontinuing or completing their school education. VET is expected to provide a 'preferred and dignified' choice rather than a terminal or 'last resort' option.

As a follow-up to this, the NCERT has attempted to infuse work across subject areas and contributed in the development of the National Skill Qualification Framework (NSQF) for the country, which was notified on 27 December 2013. It is a quality assurance framework that organises all qualifications, according to the levels of knowledge, skills and attitude. These levels, graded from one to ten, are defined in terms of learning outcomes, which the learner must possess regardless of whether they are obtained through formal, non-formal or informal learning. The NSQF sets common principles and guidelines for a nationally recognised qualification system, covering schools, vocational education and training institutions, technical education institutions, colleges and universities. It is under this backdrop that Pandit Sundarlal Sharma Central Institute of Vocational Education (PSSCIVE), Bhopal,

a constituent of the NCERT, has developed learning outcomes based modular curricula for vocational subjects from Classes IX to XII. This has been developed under the Centrally Sponsored Scheme of Vocationalisation of School Education of the Ministry of Education, erstwhile Ministry of Human Resource Development, Government of India.

This textbook has been developed as per the learning outcomes based curriculum, keeping in view the National Occupational Standards (NOSs) for the job role, to promote experiential learning related to the vocation. This will enable the students to acquire necessary skills, knowledge and attitude.

I acknowledge the contribution of the book development team, reviewers, and all institutions and organisations, which have supported in the development of this textbook.

The NCERT welcomes suggestions from students, teachers and parents, which would help us to further improve the quality of the material in subsequent editions.

HRUSHIKESH SENAPATY
Director
National Council of Educational
Research and Training

New Delhi
September 2019

About the Textbook

The rise in literacy rate and per capita income, coupled with the outreach of communication technology, especially, social media, has increased health awareness among the country's populace. With an increase in affordability and choices, the Health Care Sector is poised to grow exponentially. In fact, it has emerged as one of the largest sectors in India — both in terms of resources and employment. But with inadequate skilled nursing and paramedical personnel (including General Duty Assistants), the sector is unable to meet the increasing patient demands.

This textbook emphasises that a General Duty Assistant (GDA) is an integral part of a hospital and an important paramedic. The other names for a GDA are 'Nursing Assistant', 'Nursing Care Assistant', 'Nursing Aide', 'Bedside Assistant' and 'Orderlie'. Thus, students, opting for the job role, will learn about the duties performed by GDAs through this book.

The basic requirements for becoming a GDA are communication and observation skills, patience, politeness and alertness. The textbook has been developed on the following National Occupational Standards (NOSs).

- HSS/ N 5108: Prevention and control of infections
- HSS/ N 5106: Transportation of patients within a hospital
- HSS/ N 5112: Responding to patients' calls
- HSS/ N 9609: Biomedical waste management
- HSS/ N 5114: Handling patient samples, drugs and documents

The textbook consists of five Units. Unit 1 explains the skills that a GDA needs to possess in order to handle emergencies. These skills include procedures that the GDA must follow while responding to emergency calls, receiving patients in the hospital, handling and monitoring patients, and transportation of injured patients.

Unit 2 describes sterilisation and disinfection as the two ways of checking Hospital Associated Infections.

Unit 3 focuses on the importance of maintaining community health care, with emphasis on communicable diseases, immunisation programmes undertaken by the Government of India, taking care of the elderly and children, and basic principles of drug administration.

Unit 4 deals with biomedical waste management. It describes the sources of such waste materials, their collection, segregation, storage, transportation and disposal. It also underlines the role that the hospital staff, including GDAs, need to perform in the process.

Unit 5 underlines the importance of maintaining medical records, i.e., documentation and storage of records.

We hope this textbook will be useful for students, opting for the job role. Feedback and suggestions to improve the textbook are welcome.

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Few images used in the textbook have been sourced from the *Creative Commons License*. They have been selected with care and diligence to enable a clearer understanding. Care has been taken not to violate any copyright issue.

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Contents

Unit 1

Handling Emergency Services

The word 'emergency' is derived from the Latin word, 'emergere', meaning an 'unforeseen occurrence, requiring immediate attention'. Therefore, a medical emergency situation must be attended to without delay.

'Emergency' or 'casualty' is a vital component of every hospital and is visible from a distance as soon as one enters a facility. As the name suggests, the emergency ward attends to patients in need of urgent medical care and functions round-the-clock. It is here that a person, requiring immediate medical attention, is first brought to in a hospital. The department aims at treating the person satisfactorily or arranging for timely shifting of the patient to the next point of medical care, if required.

This Unit describes the skills a General Duty Assistant (GDA) needs to possess for handling work at a hospital's reception desk and responding to emergency calls. It also describes the procedures of receiving a patient in the hospital, rendering emergency care services, monitoring the patient's vitals (pulse rate, blood pressure, oxygen level, etc.), ensuring the person's transportation and methods of immobilisation, etc.

The GDA may be required to perform all these activities in the emergency ward. Therefore, the person must be able to understand the urgency of a patient's

Emergency may be categorised into four types — major (highly specialised facility), basic, combine (first referral centre like Primary Health Centre or Community Health Centre) and referral (only for first aid).

Did You Know

According to the World Health Organization (WHO), India sees 18.9 per cent traffic related deaths per 10,000 people every year. It further suggests that 52 per cent people, who die of cardio vascular diseases, are aged below 70 years.

health condition and act accordingly. Moreover, there needs to be coordination and communication between the emergency ward and other departments of the hospital. Therefore, one of the prerequisites for personnel handling emergency services, including GDAs, is clear, effective and timely communication, and management skills, as many situations may require urgent decision making. Lack of appropriate communication skills may add to confusion, stress and anxiety in patients and their caretakers.

Session 1: Responding to Emergency Calls and Admissions

This Session discusses the skills required for responding to emergency calls. It also emphasises that patient confidentiality as per hospital or clinic norms must be maintained.

The emergency ward of a hospital is open 24×7 as it receives a continuous inflow of critically ill patients, requiring immediate medical attention like in case of accidents, serious health conditions, etc. If such emergency conditions do not receive appropriate and timely medical care, these may lead to complications in patients, which may aggravate their condition and even cause deaths. So, every hospital must set up an organised emergency ward, as its image chiefly depends on the quality of treatment provided to patients as soon as they are brought to this unit.

A GDA performs a prominent role in handling emergency cases like assisting patients at the time of admission (during the documentation process and while filling in the admission form). The person also informs the concerned medical and paramedical staff about a patient, requiring emergency care without wasting any time, so that timely and appropriate treatment may be provided. The GDA must keep in mind that an emergency situation may be dealt with in the following manner.

- Clinical conditions need to be handled by doctors only.
- Telephonic consultation must be provided by doctors, if necessary, or sought by a patient.

Responding to emergency calls

An 'emergency medical dispatcher' is a person, who gathers all vital information related to a patient's medical condition over the phone. This person may be a GDA, who provides telephonic assistance and instructions to the patient or the person's caretaker, prior to the arrival of an ambulance. The GDA, thus, is an important reference point for patients and their family members. The person serves as an important link between the patient or the caller, hospital administration, doctors or nurses, etc. The GDA may be stationed at the hospital's front office as a receptionist or deployed in the central telephone exchange room. The person may also be entrusted with handling urgent calls between members of health care teams in hospitals, and rendering community services.

Many a time, the GDA has to deal with anxious and upset callers, enquiring about the health status of a friend or relative, or phoning just to check bed or doctor's availability, including requests for emergency appointment. The work, therefore, requires the GDA to be patient, alert and adept in handling such phone calls and situations, for which effective communication skills are a must.

In case the GDA receives a call regarding urgent hospitalisation, then the person must immediately inform the hospital's emergency team (consisting of trained staff members) for providing vital support and transportation services to the patient. In case of an accident or other health emergency condition, the team swiftly decides the course of action. One of the critical roles that the emergency team performs is assisting and guiding patients in distress.

Communication and soft skills (required by a GDA)

The GDA needs to observe the following while answering emergency phone calls.

- Be calm and polite while talking to the caller or patient, who may sound anxious, rude, stressed or annoyed.
- Listen carefully to the person on the other side of the call.

Consent form

When a doctor recommends a specific medical procedure, either the patient or the person's immediate relative has to sign a consent form, agreeing to the risks involved. It is a legal document that explains the rights and responsibilities of the parties involved, i.e., the hospital, the patient and the person's relatives.

- Do not interrupt as the person speaks.
- Gather basic information about the patient like name, age, sex, medical condition and contact details. One must also seek the contact details of the caller or the caretaker or the person's immediate relative.
- Assist the caller with simple and clear instructions. Too many instructions may leave the caller confused and add to the stress.
- Do not use the same type of response for every call.
- Respond to most comments without breaching patient confidentiality.
- One must not answer a query one is not sure of.
- Seek help from experts and communicate it to the caller.
- Prioritise incoming calls to evaluate the severity of the patient's illness or injury so that immediate and appropriate care may be provided.

Points to note while arranging for ERS

- Gather patient information like name, age, sex, contact details, etc.
- Note down the details of the attendant and one's relationship with the patient.
- Record the nature of the patient's medical problem or condition.
- Note the location and time of the incident like trauma, accident, etc.
- Coordinate for ERS.
- Record the time when the ambulance arrived with the patient at a medical centre or hospital.
- Convey the information to the concerned hospital department or official.

Communicating with an 'on-call' duty doctor

Hospitals follow certain policies to ensure smooth handling of emergency situations. These include maintaining a list of doctors like specialists and resident doctors, who evaluate patients' condition in the emergency ward and provide adequate treatment to them. Hospitals see to it that on-call duty doctors respond within a specified timeframe. In case of an emergency, the GDA may convey about a patient's health condition to the concerned doctor on call and coordinate accordingly.

It must be noted that some doctors like specialists may not be practising only with one hospital but be associated with a couple of such facilities. Such doctors also serve as on-call duty doctors.

Emergency Response Service

This service provides prompt ambulance facility to patients. To avail the service, one just needs to dial the Emergency Response Service (ERS) helpline number '108', using one's mobile or landline phone.

No STD (Subscriber Trunk Dialing) code must be dialed before the number.

There is system in place that monitors and records the time taken from receiving a medical distress call till the patient reaches the hospital. This system is monitored and supervised through a medical control room. Each State and district has a dedicated medical control room.

An ambulance is equipped with trained paramedical staff and necessary medical equipment, including five types of stretcher and a wheelchair, to ensure that quality medical care is provided to a patient while on way to hospital.

Fig. 1.1 : Dial '108' for ambulance service in India.

Practical Exercise

Activity

Visit a nearby hospital and observe the emergency and non-emergency services being provided to patients. Prepare a note in 150–200 words based on your observations and share it with the class.

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Fill in the Blanks

1. A/an _____ can handle urgent medical calls and arrange an emergency appointment for a patient.
2. In case of an emergency, the GDA may convey a patient's health condition and coordinate with the _____.
3. The Emergency Response Service provides _____ facility to a patient for transportation to a hospital.
4. The Emergency Response Service helpline number is _____.

B. Short Answer Questions

1. What is a medical emergency? Explain with an example.
2. Write a note in 80–100 words on 'Emergency Response Service'.

Important areas near the emergency ward

- Reception area
- Resuscitation area
- Observation area
- Operation theatre

Session 2: Receiving Emergency Patients in a Hospital

Hospital admission procedures are, usually, stressful for a patient, as well as, one's attendants or relatives, especially, in case of emergency situations because of various factors like prognosis of an illness, medical procedures involved, etc. This Session describes some of the duties that a GDA needs to perform during patient admission.

Hospital admission

As soon as a patient is brought to the emergency ward of a hospital, the person's immediate relative or caretaker is required to go to the reception desk and fill in an 'Admission Form' while preliminary treatment is being administered to the patient. It is only after the admission form is filled and formalities are completed that the patient is shifted to a specified ward from the emergency. The patient may be accompanied by a doctor or a paramedical staff member (including a GDA) to the ward. The hospital environment may be uncomfortable for children. Therefore, parents must explain the purpose of hospital stay to them, for example, routine check-up or assessment, medical procedure, etc. Hospital staff, including GDAs, must address children's queries patiently and be friendly with them. Parents and hospital staff must try to make a child feel comfortable, for example, one may be allowed to bring one's favourite toy to the hospital.

Duties of a GDA in the emergency ward

- To assist in transferring a patient from an ambulance to the hospital's emergency ward
- To contact the emergency control centre for support, if required
- To ensure that all diagnostic procedures in the ward are performed only under the direct supervision of a nurse or a doctor
- To assist patients, visiting the ward, requiring immediate first aid or minor treatment

- To monitor the patients' vitals like pulse rate, blood pressure, oxygen level, etc., at regular intervals, i.e., every two hours
- To communicate clearly with the patients and their relatives or attendants

Discharge procedure

The GDA must also assist patients in completing discharge related formalities. A patient needs to complete certain documentation like filling in a feedback form, as provided by the GDA or availed from the reception desk, before being discharged. After filling in the form, the patient needs to go to the reception desk and settle the bills for discharge. The GDA may help the patient carry out all these formalities.

Qualities of a GDA

- Desire to help and take care of patients
- Communication skills (written and spoken)
- Listening skills
- Quality to remain calm under pressure

Practical Exercise

Activity

Imagine a situation, where a man has met with a road accident late in the night. A passer-by calls an ambulance and the man is taken to a hospital. Enact the role of a GDA and demonstrate the duties one needs to perform when the ambulance reaches the hospital.

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Multiple Choice Questions

1. Which of these qualities about a GDA is true?
   (a) Desire to help others
   (b) Anxious while dealing with an emergency
   (c) Impatient listener
   (d) None of the above
2. Documentation is required in which of following situations?
   (a) At the time of admission
   (b) Bill settlement
   (c) At the time of discharge
   (d) All of the above
3. What are the important areas around the hospital emergency ward?
   (a) Reception desk
   (b) Observation room
   (c) Operation theatre
   (d) All of the above

4. After a patient is brought to the emergency ward of a hospital, the person's immediate relative or caretaker is required to fill in the _____ form.
   (a) admission
   (b) feedback
   (c) discharge
   (d) Both (b) and (c)

B. Short Answer Questions

1. Discuss the duties that a GDA needs to perform in case of an emergency.
2. List any two qualities that a GDA must possess.
3. Write a note on how a GDA needs to help a patient complete discharge related formalities.

SESSION 3: HANDLING AND MONITORING PATIENTS DURING DISASTERS

The primary objective of the hospital disaster management centre is to optimally prepare the staff, including GDAs; and manage disaster situations, including 'triages', timely and effectively. This Session describes medical terms like 'triage' and 'surge capacity'. It also gives insight to the measures that the hospital authorities need to take while handling such situations. Besides, it discusses the communication arrangements that need to be made when such a situation arises, and the role of the human resource department at all times.

Triage

It refers to the assignment of degrees of urgency to wounds or illnesses so as to determine the order of treatment while attending to a large number of casualties. Hospitals must provide facilities to carry out mass triage operations essential for patient care. A GDA plays a prominent role in handling triage situations. The person assists doctors in performing patient assessment, and also educates patients and their families, as and when required. The hospital authorities need to observe the following while handling mass triage situations.

- Designate a doctor experienced in managing triage operations (for example, trauma or emergency doctor or a trained emergency nurse in supervisory position)

- Ensure that the patient reception area is ventilated and secured from environmental hazards.
- The triage area must be easily accessible so that essential personnel, medical supplies and key care services [like Intensive Care Unit (ICU), Operation Theatre (OT), emergency department, etc.] are readily available to the concerned medical staff, including GDAs.
- The triage area must have defined entrance and exit gates so as to cater to mass casualties.

Triage in treatment

This deals with administering first aid to a patient and transporting the person to a hospital, if required.

Red tag (highest priority)

- Respiratory arrest, airway obstruction and difficulty in breathing
- Cardiac arrest
- Severe haemorrhage and shock
- Open chest or abdomen wound
- Severe burns
- Unconscious or comatose condition
- Poisoning

Fig. 1.2: Triage in treatment

Green tag (second priority)

- Spinal injury
- Moderate haemorrhage
- Multiple fracture
- Head injuries

White tag (of least priority)

- Minor fracture
- Minor bleeding
- Moderate or minor burns

Table 1.1: Triage handling during transportation

Category	Meaning	Action
I	Highest priority to people, requiring immediate surgery	Help in the safe evacuation of a patient and transport the person immediately to a nearby hospital.

II	Low priority to minor injury	Offer comfort to the injured person and arrange for transportation to a hospital.
III	Such cases need immediate first aid but can wait for surgery.	Administer first aid to the patient and arrange for transportation to a hospital.

Surge capacity

A 'medical surge' occurs when patient inflow exceeds a hospital's accommodating or serving capacity. Such a situation is often witnessed in case of disasters and pandemics like COVID–19, where there are mass casualties. It, therefore, implies that in order to meet the challenges of mass casualties, the hospital's disaster response team (which also includes GDAs) needs to expand its resources and make their optimal use. Some of the steps that the hospital's disaster response team needs to take are as follows.

- Display a list of resources that the hospital has and its maximum admission capacity during disasters.
- Estimate the increase in the number of patients, requiring hospital services and admission.
- Identify methods of expanding hospital in–patient capacity (taking physical space, staff, supplies and processes into consideration).
- Increase the hospital capacity by shifting non-critical patients to alternate treatment sites (for example, converting the auditorium or lobby into waiting areas, reducing a person's hospital stay).
- Ensure adequate availability of vehicles and resources required for transportation of patients.
- Identify potential gaps in the provision of medical care, with emphasis on critical and emergent surgical care.
- Designate an area to be used as a temporary morgue, and ensure adequate availability and supply of body bags for the deceased.

Fig. 1.3: Handling surge capacity

Command and control centre

A hospital may dedicate a unit like the 'command and control centre' for catering to emergencies related to disasters. This centre is responsible for the effective management of casualties, in case of disasters and triages. It carries out coordination between doctors, patients and other related stakeholders to ensure speedy recovery of patients.

Communication arrangements

No communication must be conveyed to the public without receiving a go-ahead from the hospital superintendent. Therefore, the officer must approve all information that need to be delivered to the public or media. The hospital authority needs to make the following arrangements in order to ensure effective and timely communication, especially, in case of a disaster.

- Assign a public information spokesperson to communicate with the public and media.
- Arrange an area near the emergency ward for media briefing.
- A draft of key messages to be briefed to the media must be kept handy.
- Establish a mechanism to ensure appropriate and timely reporting of information to the concerned stakeholders (government, health authorities, hospitals, private practitioners, etc.).
- Ensure that all decisions related to patient prioritisation like admission and discharge are communicated to the concerned staff and stakeholders.
- Ensure adequate availability of back-up communication systems like satellite, mobile and landline phones; computers with Internet connection; etc.

Hospital safety and security

The hospital security team must follow some measures and carry out certain activities in order to ensure the safety and security of staff and visitors, including patients and their attendants. The hospital security arrangements must keep the staff and patients safe from

NOTES

inappropriate behaviour like violence or aggression. To keep the staff and visitors safe, the hospital security department follows a number of measures. Some of these measures are as follows.

- Installing CCTV cameras and duress alarms in all wards and parking lot
- Deploying security guards at all entry and exit gates
- Monitoring the ID cards of visitors at the entrance and exit gates
- Providing smooth access to medical and paramedical staff to patient care areas
- Ensuring easy accessibility to medical and paramedical staff to triage site(s) and other areas witnessing heavy patient inflow like emergency ward, out-patient department (OPD), parking lot, etc.
- Limiting the number of visitors in wards by deploying security staff
- Controlling crowds so that the hospital staff can work smoothly
- Making appropriate arrangements to ensure safe evacuation of staff and patients in case of an emergency
- Taking frequent inputs from the hospital staff, including the security team, to identify potential security risks, gaps in the management of hazardous material, and prevention and control of infections
- Ensuring patient confidentiality
- Establishing an area for radioactive, biological and chemical decontamination and isolation
- Ensuring coordination with other security agencies, if needed

Human resource management

The Human Resource department is one of the major departments in a hospital. Human resource management is essential to ensure adequate staff availability, including that of GDAs, and continuity of normal hospital operations at all times, especially, during disasters. The hospital authorities need to

observe the following in order to manage the available human resources optimally and effectively.

- Update the hospital staff list.
- Track and monitor staff absenteeism.
- Ensure that the professional requirements of the hospital are met timely.
- Ensure availability of food, water and living space for the hospital staff.
- Recruit and train additional staff (e.g., retired staff from the health care sector, reserve military personnel, university affiliates, students and volunteers), as per the need.
- Address insurance and temporary licensing issues related to additional staff and volunteers working in areas outside the scope of their training, for which they do not have a licence.
- Create a reserve pool of workforce to handle medical emergencies like pandemic, etc.
- Provide necessary staff training in areas having the potential of increased clinical demand, including emergency and intensive care.
- Identify domestic support measures (e.g., travel, child care, care for the sick or disabled) to enable staff flexibility for shift re-assignment and longer working hours.
- Maintain uninterrupted supply of consumables, medicines and other essential commodities.

Practical Exercise

Activity

Visit a nearby hospital and observe medical and paramedical staff (like doctors, nurses, ward personnel, GDAs, sanitation workers, etc.) attending to patients or performing hospital care duties. Talk to some of them and fill in the following table.

Material required: PPE kit, sanitiser and writing material

S. No.	Employee's name	Designation	Duty
1.			
2.			
3.			
4.			
5.			

NOTES

Check Your Progress

A. Fill in the Blanks

1. A hospital _____ is essential for the effective management of emergency situations like disasters and triages.
2. All communication conveyed to the public and media must be approved by the _____.
3. _____ implies that a hospital disaster response team needs to expand its resources in order to meet the challenge of mass casualties.
4. _____ management is essential for ensuring adequate staff availability.
5. Cardiac is allotted the highest priority in triage treatment and is tagged in _____ colour.
6. Spinal injury and multiple fracture are tagged in _____ colour.

B. Short Answer Questions

1. Discuss the role of the hospital command and control centre in handling a disaster case.
2. Write a note on the communication strategy that needs to be followed in case of disasters.
3. List any three safety and security measures that a hospital needs to follow.

SESSION 4: TRANSPORTATION OF INJURED PATIENTS

Medical transportation must be safe and speedy as it aims to help a patient reach a hospital or health facility in time without further deterioration in one's condition. Therefore, transporting injured patients to a hospital requires a specific set of skills. This Session discusses types of transportation and some of the measures that need to be observed while transporting an injured patient to a hospital and within the hospital premises. Besides, it describes 'immobilisation', its types and usefulness. A GDA plays an important role in patient transportation (both internal and external).

The method of transportation depends on the following factors.

- Nature and severity of injury
- Distance to the hospital or health facility
- Nature of the route to be covered
- Distance to be covered (within the hospital or to the hospital)

Types of transportation

Internal transportation

This involves the use of trolleys, stretchers, lifts, escalators, etc., for transporting patients, equipment and other supplies within the hospital premises.

Stretcher

A stretcher is used to carry a person, who is unable to move on one's own. Two paramedical staff are required to carry a patient, who must lie flat, on a stretcher.

(a) Stretcher trolley

(b) Trolley bed stretcher

Fig. 1.4 (a and b): Different types of stretcher

Types of stretcher

- Farley stretcher (general)
- Utile stretcher (foldable from the middle)
- Pale and canvas stretcher
- Scoop stretcher (orthopaedic)
- Trolley bed stretcher (general with trolley)
- Neil Robertson stretcher (for rescue purposes)
- Para guard stretcher (foldable from the top)
- Improvised stretcher

Carrying a loaded stretcher

The GDA and other paramedical staff must take care of the following points while carrying a patient on a stretcher.

- The patient's head must be positioned higher than the feet.
- Put the patient's feet on the stretcher first, followed by the upper part of the body, except in these situations.

- While going downhill, when the patient's lower limb is injured, or in case of hyposthenia
- While shifting the patient in an ambulance

External transportation

It refers to a patient's transportation outside the hospital. Ambulances, relief vans, trains, ambulance trains, cars, rickshaws, bicycles, bullock carts, aircraft, horses, mules, labourers, etc., are used to transport patients. The mode of transportation chosen or used depends on the situation, and socio-economic condition of the patient and one's family.

Ambulance transportation

A critically ill or severely injured person must not move by oneself but wait for medical help, i.e., ambulance, to arrive. However, this may sometimes lead to deterioration in one's condition, if medical help is delayed. Moreover, ambulance transportation to a hospital needs to be safe and speedy, i.e., there should be minimum wastage of time. Some of the points that must be taken care of in case of ambulance transportation are as follows.

- Paramedical and ambulance staff must not assume that the patient would be in a position to sit or stand on one's own without support. Therefore, they must always provide assistance to the person.
- The method of transportation depends on the nature and severity of one's condition or injury.
- The ambulance and paramedical staff must always follow the guidelines, as laid down by the Union or State health ministry or Medical Council of India (MCI), in case of patient transportation.
- The medical transportation staff must closely monitor the patient's health condition during transportation to a hospital.
- The paramedical staff must see to it that the ambulance driver drives carefully and does not speed.

- They must see to it that all monitoring devices and other medical equipment stationed in the ambulance are tightly secured to check the risk of falls during transportation.
- Dressing of a patient's bleeding wound must be done during transportation.
- In case of transporting a haemorrhage patient, one needs to observe for recurrence.

Precautions to be taken before transportation

The GDA and other paramedical staff need to take the following precautions before transporting a patient to the hospital.

- Keep the patient, for example, an injured person, in a position that does not pose a threat to one's life.
- Perform the patient's quick examination (from head-to-toe) in order to prevent further deterioration of one's condition.
- Provide support to the injured part.
- Administer first aid to the patient immediately.

Medical transportation: posture to be maintained

- A caregiver's back must be straight and head held in neutral position. The person must ensure that the patient's injured part is held close to one's body. The caregiver may use one's shoulders to support the patient's weight.
- If it seems that the patient may slip, then one must let the person slide slowly and gently to the ground without causing a risk to the injured area.
- While lifting the patient, it is important to keep the back straight while bending at the knees.

Immobilisation

While managing fractures, it is important to ensure that the involved body part(s), when healed, becomes optimally functional. This can be achieved by following an 'immobilisation' technique. Immobilisation is done to fix the fractured part in such a manner that it is unable to move for some time so that healing takes place. Besides, the patient is provided with functional aftercare advice. Immobilisation, thus, helps prevent further damage by restricting body movement. It also helps reduce pain, muscle swelling and muscle spasm.

Types of immobilisation

Non-operative immobilisation

Non-operative or close therapy immobilisation is performed initially for a fracture that is displaced, shortened or angulated. This is achieved by applying traction to the long axis of the injured limb, and then, reversing the mechanism of injury or fracture, followed

by subsequent immobilisation through casting or splinting. The therapy consists of cast and traction (skin and skeletal).

Cast

It is a shell made of plaster, encasing a broken or fractured limb. The cast holds the broken bone in place and restricts its movement till it heals. It also helps reduce muscle contractions and pain.

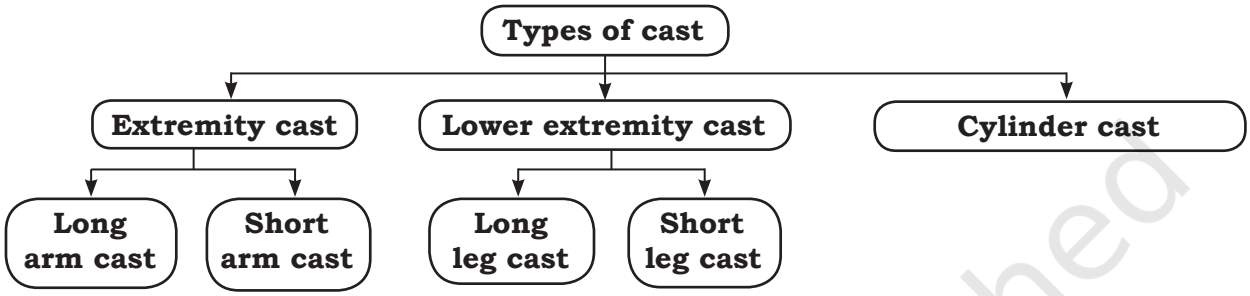

Fig. 1.5: Types of cast

Extremity cast: It encases the arm, hand and wrist. A 'long arm cast' encases the arm from about two inches below the armpit up to the wrist, leaving only the fingers and thumbs free, whereas, a 'short arm cast' ends just below the elbow.

(a)

(b)

Fig. 1.6 (a and b): Short leg cast

Lower extremity cast: It is of two types — long and short leg cast. In 'long leg cast', the foot and leg up to the hip are encased. A cast, encasing the patient's foot, ankle and lower leg just below the knee, is called 'short leg cast'. A walking heel may be placed for ambulation, elevating the toes so that they are protected from dirt and moisture.

Cylinder cast: In some cases, a cast may include the upper and lower arm but not the wrist and fingers, or the upper and lower leg but not the foot and ankle. Such a cast may be called 'cylinder cast'.

Splint

It is used to give support to a broken bone and aid healing. Therefore, a splint immobilises the affected area till it heals and becomes optimally functional. Splinting can be done prior to transportation to facilitate safer transit of the patient.

Ortho-glass: It is an easy to handle fibre glass splinting material found in most hospital emergency rooms. It is used for the following reasons.

- It is clean, unlike most plaster splinting material.
- It comes in rolls. So, it can be easily measured and cut, as per the requirement.
- It comes padded, which saves time and energy while trying to rollout the padding.
- It dries in about 20 minutes and there is no risk of burn.

Plaster bandage

It is one of the most common tools when it comes to mold making and casting. It consists of a cotton bandage and Plaster of Paris (PoP), which hardens on moistening, immobilising the affected or fractured bone(s) and aiding the healing process.

Closed reduction

It is a procedure to fix a broken bone without a surgery. The broken bone is put back in place, which allows it to heal. It works best when immediately done after a fracture.

(a)

(b)

(c)

Fig. 1.7 (a, b and c): Types of splint (plaster bandages)

Practical Exercise

Activity

Visit a nearby hospital and observe paramedical staff, including GDAs, transporting patients on stretchers. Fill in the following table with the types of stretcher used for transportation of patients with varied health conditions.

Material required: PPE kit, sanitiser and writing material

Type of stretcher	Condition of the patient	Label of casualty

Check Your Progress

A. Fill in the Blanks

1. The hospital transportation system is divided into _____ and _____ transportation.
2. Examples of _____ transportation include trolleys, stretchers, lifts, escalators, etc., which are meant for transporting patients, equipment and supplies within the hospital.
3. _____ is a procedure to fix a broken bone without a surgery.
4. A _____ consists of cotton bandage and PoP.

B. Short Answer Questions

1. List any three precautions that need to be taken before transporting a patient to a hospital.
2. What is the difference between internal and external transportation?
3. List at least three points that need to be taken care of in case of ambulance transportation.
4. What is immobilisation?
5. Write a note on 'splint' as a way of immobilisation tool.

Unit 2

Disinfection and Sterilisation

Hospitals may serve as a major source of contamination, and hence, as a hotbed for harmful pathogens, which may cause infections. In few cases, these infections may turn out to be severe in nature. Therefore, the sanitation department of a hospital follows several ways to check the origin and spread of microorganisms, contamination and infections.

'Disinfection' and 'sterilisation' are two common methods of eliminating the growth and spread of microorganisms. The two words are often used interchangeably but are different in meaning.

'Disinfection' is the process of eliminating or reducing harmful microorganisms like fungi, bacteria, viruses, etc., from inanimate objects and surfaces, reducing their pathogenic effects; whereas, 'sterilisation' is the process of killing all microorganisms, including spores, in order to maintain a sterile environment. Microbes react differently to different sterilisation methods like heat (steam or dry heat), chemicals, irradiation, high pressure, filtration and Ethylene oxide gas. Therefore, one needs to be cautious while choosing a sterilisation method.

Some of the steps followed after disinfection and sterilisation of articles include rinsing and cleaning, drying, checking the articles for damage (if any), packaging, labeling the package (which includes writing the name of the article, its contents, date of sterilisation and its expiry date), storage and distribution.

The monitoring of disinfection and sterilisation is supervised either by a medical microbiologist or the hospital infection control team, including laundry staff. GDAs need to perform an observatory role and establish coordination between wards and laundry service department in order to check infections.

This Unit gives basic knowledge about performing disinfection and sterilisation of wards, and medical tools and equipment.

Session 1: Prevention and Control of Hospital Associated Infections

This Session describes the role of doctors, nurses, GDAs and other hospital staff in the prevention and control of Hospital Associated Infections (HAIs).

Hospital associated infections

Also known as 'nosocomial' infections, these refer to infectious diseases acquired during one's stay at a hospital or health care facility. These infections are not present in a patient at the time of admission but occur within 72 hours of admission. Such infections are caused by antibiotic resistant organisms. Some common nosocomial infections are urinary tract infections, respiratory pneumonia, surgical site wound infections, bacteremia, gastrointestinal and skin infections. Bacteria are the most common cause of such infections. These infections extend a patient's stay in the hospital as the person takes more time to recover, thereby, escalating the medical bills.

Patients undergoing treatment in high-risk areas of the hospital like Intensive Care Unit (ICU) are more susceptible to infections. Some of the factors that may lead to HAIs are as follows.

Points to remember

To handle non-sterilised items, a person must:

- be trained and vaccinated.
- always wear Personal Protective Equipment (PPE). A PPE kit includes face mask, face shield, goggles, gloves, boots, head gear and apron.

- Long hospital stay
- Inappropriate and minimal hand washing by attending hospital staff
- Overuse of antibiotics
- Equipment used for invasive procedures
- Wounds, incisions (surgical cuts), burns and ulcers

Patients at a risk

All patients admitted to the hospital are at a risk of contracting HAIs. Those commonly susceptible to contracting such infections are as follows.

- Premature babies
- Children in the age group of 2–12 years
- Critically ill people
- Elderly people
- People with medical conditions like diabetes
- Patients with impaired immunity
- People having undergone a surgery

Controlling infections

The spread of infections may be controlled and reduced by adopting the following measures.

- Adhering to the hospital infection control guidelines and policies
- Appropriate and frequent hand washing by the hospital staff, including members of the infection control team
- Restricted use of antibiotics

Duties of a GDA and a nurse

GDAs and nurses are members of the infection control team. They need to observe certain precautions in accordance with the hospital policies and guidelines so as to maintain sterility in the hospital premises, especially, wards. Some of the measures and practices that they need to observe in order to check the spread of infections are as follows.

- Follow aseptic technique that includes washing of the hands with soap and water, and sanitising the hands at frequent intervals.

Common tools that may cause infections

Some tools used to carry out invasive procedures in a hospital may lead to infections. Some such common tools are as follows.

- Implants
- Prosthetic devices
- Surgical instruments
- Needles
- Cardiac catheters
- Urinary catheters
- Biopsy forceps of an endoscope

Steps to wear Personal Protective Equipment

Step 1: Wear the gown first by adjusting it at the neck. Ensure that the gown is fitting.

Step 2: Wear a face mask and goggles or face shield.

Step 3: Finally, wear gloves and boots.

- Immediately inform the attending physician in case a patient contracts an infection.
- Reduce a patient's exposure to other patients and visitors.
- Wear a PPE kit before touching a patient.
- Conduct hospital surveillance as per the infection control procedures.
- Educate people on appropriate disposal of waste.

Role of GDAs in various hospital departments

GDAs, like other medical and paramedical staff, are required to work in various departments of a hospital. Therefore, they must be aware of infection control measures like disinfection, cleaning and sterilisation.

Central sterile supply department

Working in the central sterile supply department is important for a GDA so that the person becomes aware of the hospital infection control measures and learns the process of sterilisation. The person needs to take part in the maintenance and upkeep of hospital equipment, and should be aware of processes like cleaning, decontamination, sterilisation and storage.

Food service department

The hospital's food service department takes care of the dietary needs of patients and catering services. Therefore, it is important for people working here to ensure that high standards of hygiene and cleanliness are maintained in the preparation and serving of meals. Therefore, a GDA, working in the food service department, must take note of the following points.

- Ensure that all utensils (used for food preparation) and serving dishes are stored in clean shelves.
- Maintain personal hygiene and follow instructions as regards to hand washing, clothing (wearing PPE kit), etc.
- Ensure that the food is prepared, stored and distributed hygienically so as to check contamination and wastage.
- Ensure appropriate handling and disposal of waste.

Laundry service department

The GDA is responsible for the following activities.

- Segregate linen used in different areas of the hospital, especially, dirty and infected ones.
- Disinfect the linen before sending them for washing.
- Ensure that the linen are washed appropriately to check cross-contamination.
- Maintain adequate linen supply in all wards.

Housekeeping department

The GDA has to perform the following tasks.

- Classify different hospital areas as per the type of cleaning required.
- Adhere to the biomedical waste rules as regards to the collection, transportation and disposal of different types of waste.
- Inform the concerned service providers about repair works, cracks or defects in sanitary and electrical equipment or fittings, etc.
- Take care of plants kept in public areas.
- Carry out pest control exercises to check infestation and rodents.

Practical Exercise

Activity

Students, in groups of four, may be sent to a nearby hospital to observe the activities being performed by the staff to check infestation or HAIs. They may also talk to some of the concerned staff members. Each group, then, needs to prepare a note based on its interaction and observations, and give a presentation before the class.

Material required: writing material, face mask and sanitiser

Check Your Progress

A. Fill in the Blanks

1. Hospital Associated Infections are also called _____ infections.
2. Disinfection and _____ are two common methods of eliminating the growth and spread of microorganisms.

3. One must wear a _____ kit before touching patients.
4. _____ includes washing the hands with soap and water, and sanitising the hands at frequent intervals.

B. Short Answer Questions

1. Write short notes on the following.
   (a) Disinfection
   (b) Sterilisation
2. Discuss Hospital Associated Infections. What is the role of a GDA in controlling such infections?
3. Identify three common tools that may cause infections in a hospital.

SESSION 2: DISINFECTING THE WARD AND EQUIPMENT

Microorganisms are present everywhere and hospitals may serve as a major source of infections, if appropriate and regular cleaning and disinfection measures are not followed. As providing a safe, clean and orderly environment is one of the primary responsibilities of all hospital staff, housekeeping is of paramount importance. Every patient, visiting the hospital is at a risk of contracting Hospital Associated Infections (HAIs), and hence, must be protected. Therefore, cleaning, sterilisation and disinfection (manual, chemical and other methods) of the work area, surfaces and objects must be carried out in the hospital at frequent intervals daily, which students opting for the job role of a GDA must be made aware of.

This Session discusses some of the methods commonly adopted by hospital staff for disinfecting the wards and medical equipment. It also describes 'pest control' and 'types of waste'.

Types of waste

Wastes generated from the hospital must be carefully and appropriately disposed as per the government guidelines. The different types of waste generated in a hospital include the following.

Solid waste

It is similar to municipal or non-regulated medical waste.

Regulated medical waste

Also known as 'bio-hazardous' or 'infectious medical' waste, it has the potential of causing infectious diseases. Regulated medical waste includes blood soaked items, pathological and microbiological waste (cultures and specimens), contaminated sharps and isolation waste.

Pharmaceutical waste

It includes used and unused expired pharmaceutical material, over-the-counter medicines and used personal care products. Being hazardous in nature, such waste must be handled and disposed with caution. Pharmaceutical waste poses a risk to both public and environmental health. Few examples of such waste are used gloves, masks, bandages, scalpels, needles, syringes, drugs containing hazardous or non-hazardous chemicals, etc.

Universal waste

It includes batteries, pesticides, equipment containing mercury, bulbs (lamps), etc.

Recyclables

Such waste items may be converted to reusable materials. Few examples of recyclables in the health care sector are paper and cardboard pieces, food and beverage containers, metal and glass pieces, etc. These are segregated into blue and green category.

Cleaning

It is an important preparatory role that must be performed before sterilisation or disinfection of the work area, tools and equipment. Cleaning helps remove dust and dirt, and reduces microbial burden, making sterilisation more effective. It must be ensured that all medical tools and equipment, linen, floors and walls are cleaned and disinfected daily to check the growth and spread of infections. Maintaining cleanliness and orderliness go hand-in-hand.

Common cleaning machines

- Sweeping machines
- Floor cleaning machines
- Floor scrubbing machines
- Floor polishing machines
- High pressure machines for bathrooms

Daily cleaning

It includes dusting the furniture; sweeping and mopping the floors; cleaning fixtures, doors and windows, and bathrooms; clearing and cleaning the dustbins, etc.

Periodic cleaning

It involves floor waxing, dusting high ceilings, cleaning the carpets, changing drapers, etc.

Purposes of cleaning

- To remove dirt and dust from work surfaces, medical tools and equipment, floors, walls, ceilings, etc.
- To prolong the life of articles and always keep them ready for use
- To ensure seamless work environment
- To ensure patient comfort

Pest control

Every hospital management must ensure regular and timely implementation of an Integrated Pest Management (IPM) programme. As part of the programme, the hospital sanitation staff is required to carry out measures to check bug and pest infestation. They must see to it that the IPM measures adopted do not have hazardous impact on people inhabiting the hospital, i.e., employees, patients and visitors.

Pesticides must be used only when absolutely necessary. The hospital must always consult a licensed pest control agency for pesticide application. A notification regarding pesticide application must be circulated among the hospital staff in advance and all necessary precautions be taken. Besides, the hospital staff must be aware of the hazardous effects of pesticide application and IPM practices. Records of all pesticide applications need to be duly maintained by the sanitation staff.

Sterilisation

It is the process by which an article, surface or medium is cleaned of all living microorganisms either

in vegetative or spore state. Sterilisation, usually, involves the usage of heat, chemicals and radiation. While cooking, heat is applied to the food to make it edible and free of microorganisms.

Moist sterilisation is mostly used to sterilise medical tools and equipment in hospitals, laboratories, etc. 'Autoclave' is a machine that uses regulated steam (moist heat) to kill microorganisms. If one wishes to sterilise an item in an autoclave machine (Fig. 2.3), one needs to put it inside an autoclave pressure vessel.

Radiation kills germs that may cause infections and diseases. In case of sterilisation by way of radiation, the selected equipment is exposed to X-rays, gamma rays or electron beam.

Sterile filtration is used for specimens or culture on which other methods of sterilisation are not suitable.

Fig. 2.1: A sterilised dressing tray

Sterilisation agents

Physical agents

- Sunlight
- Drying
- Dry heat — flaming, incineration, hot air, etc.
- Moist heat — pasteurisation, boiling, steaming under normal pressure, etc.
- Filtration — candles, asbestos pads, membranes, etc.
- Radiation
- Ultrasonic and sonic vibrations

Fig. 2.2: Sorting instruments for sterilisation

Fig. 2.3: An autoclave machine is often used for sterilisation.

Chemical agents

- Alcohol — ethyl, isopropyl, trichlorobutanol, etc.
- Aldehydes — formaldehyde, glutaraldehyde, etc.
- Dyes
- Halogens
- Phenols
- Surface — active agents
- Gases — Ethylene oxide, formaldehyde, beta propiolactone, etc.

Disinfection

Fig. 2.4: Instruments kept in a disinfectant solution

It implies destruction or removal of all pathogenic organisms from a surface. It is used in conditions, where sterilisation is not needed, for example, disinfection of bed pans, washbasins, eating utensils and clothes.

Properties of a disinfectant

- Kills pathogens
- Non-poisonous in nature
- Not harmful to inanimate objects
- Stable (not pungent and does not cause irritation)

Fig. 2.5: Soap is the 'first line' in the disinfection process.

Common disinfecting agents

Soap and detergent

Soaps are the 'first line' in the disinfection process. These are made of Sodium or Potassium salts of fatty acids, whereas, detergents are artificial surfactants. Their usage kills microbial growth and infestation.

Halogen

It is a chemical element that forms a salt on reacting with a metal. Iodine and Chloride are the two types of halogen commonly used as anti-microbials. Iodine is commonly used as an antiseptic against microbes, fungi and viruses. Chlorine is used as a disinfectant (10 per cent in a bleaching agent). Hypochlorous acid (HCIO) is formed when chlorine dissolves in water. Hypochlorite is a commonly used disinfectant. It is also often mixed in drinking water and swimming pools due to its strong disinfecting property.

Phenol

It is an antiseptic and a disinfectant. Phenol is effective against bacteria, fungi and viruses. As an antiseptic, it is applied on to the skin in case of irritation or itchiness.

Alcohol

It refers to two chemicals soluble in water — ethyl and isopropyl alcohol. They are bactericidal and bacteriostatic (substances that check bacterial growth) against vegetative forms of bacteria. Their germicidal activity drops sharply when diluted at less than 50 per cent concentration. Alcohol is commonly used as a topical antiseptic. It is also used to sterilise medical tools and equipment. Ethyl or isopropyl alcohol, at 70–75 per cent, is used for disinfecting a thermometer before use and applied on to the skin prior to injection.

Iodine and iodophore

These compounds are bactericidal, sporicidal, virucidal and fungicidal but require prolonged contact time. 'Iodophore' is used for disinfecting blood culture bottles and medical equipment like hydrotherapy tanks, thermometers and endoscopes. The disinfectant property of iodine is neutralised in presence of organic material. So, applications are repeated for thorough disinfection. Iodine tinctures can cause skin irritation and even stain fabric. Besides, they are corrosive in nature.

Antisepsis and antiseptic

'Antisepsis' is the method of using a chemical called 'antiseptic' to destroy microorganisms that may cause infections. It was developed by British surgeon Joseph Lister. Antisepsis helps prevent surgical infections and ensures safe surgery.

Antiseptic, thus, is a substance that stops or slows the growth of microorganisms. It can simply be applied on to the skin in case of a wound or irritation. Antiseptics are frequently used in hospitals and other health care facilities to reduce the risk of infection during a surgery and other clinical procedures.

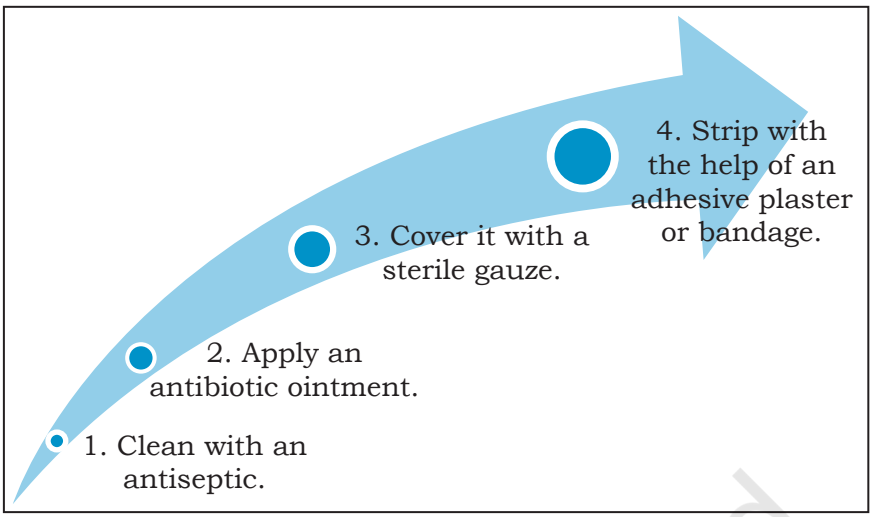

Fig. 2.6: Simple wound dressing

Decontamination

It refers to the process of rendering an article or surface free of microorganisms.

Practical Exercise

Activity

Visit a nearby hospital and request a ward in-charge to show the use of the following chemicals. Write any three uses of each of these chemicals on the basis of your observation.

Material required: writing material, PPE kit and sanitiser

Chemicals	Usage
Chlorine	1. 2. 3.
Phenol	1. 2. 3.
Alcohol	1. 2. 3.
Iodine	1. 2. 3.

Check Your Progress

A. Fill in the Blanks

1. The full form of IPM is _____.
2. _____ is the process by which an article, surface or medium is cleaned of all living microorganisms either in vegetative or spore state.
3. In _____ sterilisation, the selected equipment is exposed to X-rays, gamma rays or electron beam.
4. _____ is the destruction or removal of all pathogenic organisms from a surface.

B. Short Answer Questions

1. Write a short note on antisepsis.
2. Write a short note on cleaning. Discuss its types.
3. What do you understand by pest control?
4. Discuss the different types of waste.
5. List any two types of physical and chemical sterilisation agents.

SESSION 3: DISINFECTING THE PATIENT TREATMENT AREA

This Session discusses the types of disinfection, including fumigation with Sulphur, and management of the isolation unit or ward. Besides, it elaborates the housekeeping practices that are, usually, adopted in hospitals and the purpose of cleaning.

Types of disinfection

Concurrent disinfection

It is a routine hospital procedure, which refers to immediate disinfection of all contaminated articles. It includes the following.

- Regular cleaning of the isolation unit, including the floor using an appropriate disinfectant
- Disinfection of all articles, including soiled linen and contaminated articles, before they are sent out of the isolation unit

Terminal disinfection

It is the process of disinfecting the patient unit on discharge, i.e., transfer or death of a patient, suffering

from an infectious disease. 'Fumigation' is the process followed for terminal disinfection. Sulphur and Formalin are commonly used agents for carrying out terminal disinfection. All doors and windows, including crevices, are closed prior to fumigation.

Fumigation with Sulphur

Fumigation of hospital rooms with Sulphur reduces the growth and spread of microbial agents, which helps check infections. A room, measuring 100 square feet, requires about 220 grams of Sulphur, which is placed in an earthen pot kept on a large oven containing hot water. Articles that need to be disinfected must be kept uncovered. The process of disinfection happens as Sulphur fumes envelope their surfaces.

Management of the isolation unit

A unit set up for the isolation of patients needs to be clearly demarcated. A card, with 'ISOLATION' written on it, must be pasted prominently on the main door.

Before entering the room, a General Duty Assistant (GDA), like other hospital staff, must wash one's hands with an anti-bacterial soap and water, and wear a sanitised PPE kit (apron, gloves and mask). The door of the isolation unit must be closed immediately. It is only after closing the door that the person may attend to a patient. All aseptic practices to prevent the spread of infections must be followed. After attending to the patient, one must immediately close the door, remove the PPE kit, dispose them appropriately as per the biomedical waste management guidelines, and wash or sanitise the hands appropriately.

The isolation unit must have the following facilities and articles.

- Separate toilet and bathing area
- Toiletries like bathing and oral care kit, etc.
- Tissue papers
- A table, containing necessary supplies for patient care, e.g., thermometer, dressing trays, etc.
- Garbage bins with paper lining as per the biomedical waste management guidelines
- Personal articles for serving food, etc.

- A demarcated area for keeping clean PPE supplies, e.g., gloves, gowns or aprons, masks, etc.
- Vessels, containing an appropriate solution, for disinfecting articles, equipment or tools

Housekeeping

It is one of the most important departments in a hospital responsible for maintaining cleanliness and upkeep of the premises, including patient care areas. Apart from maintaining cleanliness and upkeep of the hospital, housekeeping practices include abiding by the biomedical waste management guidelines (discussed in Unit 4), ensuring personal hygiene (before and after touching a patient), and disinfecting and sterilising articles used in patient care to prevent the occurence and spread of infections and diseases.

In many hospitals, the housekeeping responsibility lies with the head nurse, while in many, there is a separate department managed by a housekeeper. Sometimes, this responsibility is shared jointly by the head nurse and staff of the housekeeping department. A GDA must immediately inform the department or the concerned staff member(s) in case lapses as regards to cleanliness and hygiene are observed.

Practical Exercise

Activity

Visit a nearby hospital. Interact with a housekeeping department staff member about the cleaning and disinfection activities performed by the department daily. Write five such duties that are performed daily and share it with the class.

Material required: writing material, sanitiser and PPE kit

Check Your Progress

A. Multiple Choice Questions

1. A General Duty Assistant must _____ before entering the isolation unit.
   (a) wash one's hands with an anti-bacterial soap and water
   (b) wear a clean apron, gloves and mask
   (c) Both (a) and (b)
   (d) None of the above

2. The housekeeping responsibility is managed by the _____ or the _____ in a hospital.
   (a) manager, GDA
   (b) head nurse, housekeeper
   (c) doctor, nurse
   (d) None of the above

B Match the Columns

A	B
(i) Concurrent disinfection	(a) Sulphur
(ii) Terminal disinfection	(b) Routine activity
(iii) Fumigation	(c) Sulphur and Formalin

C. Short Answer Questions

1. Distinguish between concurrent and terminal disinfection.
2. Explain the process of fumigation with Sulphur.
3. Discuss the need to keep a hospital's isolation unit clean and disinfected.

SESSION 4: CARE AND CLEANING OF ARTICLES

This Session discusses taking care of different ward articles, including rubber items, and medical tools and equipment used in a hospital, which students opting for the job role of a General Duty Assistant must be aware of. It also underlines the procedures that need to be followed for removing different types of stain.

Upkeep of rubber articles

Rubber articles commonly used in a hospital are air cushions, mackintoshes (also called 'mac' or 'mack', it is a coat made of a material that keeps a person warm and dry), hot water bottles, ice caps, ice collars, rubber tubes, catheters (a thin tube inserted into the body of a patient to remove liquids like urine), rectal tubes, gloves, rubber beds, etc. Taking appropriate care of rubber items prolongs their life. The quality of natural and synthetic rubber deteriorates with time, and also with exposure to heat, light, moisture and chemicals. So, rubber articles must not be folded or exposed to sunlight or heat, or rinsed in boiling water. If an article needs to be put into boiling water, then it must be ensured that it is placed only for a maximum of 10 minutes. If autoclaving is to be done for some articles, even then, they must not be exposed for more than 10 to 15 minutes.

Rubber mackintosh

A mackintosh must be spread on a flat surface like a table and cleaned with a mild soap and water. One needs to ensure that both its sides are washed under running water so that no trace of soap is left. Care must be taken while removing the stains. For disinfecting the mackintosh, one may use a solution consisting of an appropriate disinfectant or spray and water in the ratio of 1:40. After washing it under running water, the mackintosh must be hanged on a horizontal cylindrical pole for drying. This prevents the mackintosh from shrinking. Besides, French chalk powder must be sprayed between the mackintoshes as they are rolled. They must be stored in airtight containers in a dark and cool place.

Rubber gloves

These are an essential component of the Personal Protective Equipment (PPE) kit used by medical and paramedical staff. Therefore, it is important to ensure that they are washed appropriately before and after use. A pair of rubber gloves must be washed with a mild soap and water. The gloves must, then, be inverted and the process of washing needs to be repeated. The gloves must be checked for holes and tears by submerging them in water. These are visible as bubbles appear in water. Both the sides of the gloves need to be dried and powder must be sprayed on the inside and outside before storing them in a dark and cool place.

However, steam under pressure is the most ideal method of sterilising gloves. But it must be ensured that adequate pressure is maintained to prevent them from melting.

Rubber tubes

Rubber tubes like catheters vary in size and quality, according to the purpose of use. The size of a catheter is marked on the outside either in French or English scales.

A rubber tube must always be washed in running water first. One must hold the eye end of the tube

upwards and allow water to pass through it. Traces of organic matter stuck in the tube must be removed with the help of a swab stick. The tube must, then, be cleaned with a mild soap and warm water. Water must again be made to pass through it in order to remove dirt and grease, if any. It must, then, be boiled in water for five minutes. After this, the tube needs to be left for drying. It must be stored in an airtight container. However, one needs to autoclave or boil the tube again before use.

Extra caution needs to be observed for the maintenance and upkeep of rubber tubes that are to be used in parenteral therapy. A rubber tube (to be used for this therapy) must be washed with a detergent solution, followed by running water, and finally, distilled water.

Infusion solution flowing through a rubber tube may sometimes contain a negligible amount of rubber, which may be toxic to a patient. Therefore, the tube must be boiled in 10 per cent soda bicarb solution for 30 minutes. Before being used for a patient, it must be ensured that no trace of soda bicarb is left in the tube.

A tube, containing blood, must never be re-used for any kind of intravenous infusion as it cannot be cleaned thoroughly. So, it is better to use only unused disposable tubes for blood transfusions.

Catheters like urethra catheters may easily be destroyed by heat. They are disinfected using Formalin tablet.

Hard rubber tips used in cleaning and medicating body cavities also need special care. They are molded into different shapes. Heat softens rubber, reduces the curved portion to a straight tip and roughens the polished surface. But it is important to retain the original shape of the tips. Therefore, rubber tubes need to be disinfected with chemicals.

Upkeep of enamelware

Some of the enamelware articles commonly used in a hospital are bedpans, urinals, kidney trays, sputum cups, feeding cups and trays, etc. Enamelware get eroded on coming in contact with heat, mercuric salt, acids, alkalies and chemicals. One must ensure that

these articles are not banged as the enamel may chip off, making them unsafe for use. Also, one must see to it that these articles are not boiled for more than 2–3 minutes. Besides, they must be cooled rapidly as they cannot withstand heat.

Sputum cups

Before giving a sputum cup to a patient, one must grease it on the inside with an antiseptic lotion in order to prevent sputum from sticking onto its surface and sides. Non-infectious sputum is, usually, emptied into a lavatory pan, and the cup is, then, disinfected and cleaned. A sputum cup, containing infectious sputum, (e.g., that of a tuberculosis patient) may also be emptied in the lavatory, and then, be disinfected and cleaned in boiling water or with chemicals, or incinerated.

Upkeep of sharp instruments

Knives, scissors and surgical blades are some of the commonly used sharp instruments in a hospital that need to be autoclaved at a temperature of 121° C for 15 minutes at a pressure of 15 pounds. These items may also be sterilised using chemicals. For disinfecting these articles, they may be dipped into a non-corrosive disinfectant. It is important to check the effect of the disinfectant before use.

Upkeep of other instruments

Instruments used in an operation theatre may be contaminated. Therefore, one must always wear a pair of gloves while handling them. Instruments that are to be cleaned may be put in a washbasin or a bucket, and rinsed under running cold water so that bloodstain and other organic matter that may be stuck to these are easily removed or washed off. After this, they need to be cleaned with Sodium carbonate (2 per cent) solution mixed in lukewarm water. All instruments must be checked for cleanliness before being sent for sterilisation. Unclean instruments must be treated separately. Pressured steam (at 15 pounds) must be used to sterilise the instruments. In case, steam

under pressure is not available, boiling water is the best suited alternative for sterilising the instruments. The instruments may be kept in boiling water for 10–15 minutes (which is mentioned on their package).

Upkeep of glassware

When buying glassware, one must select material that is resistant to heat and mechanical shock. Dry heat sterilisation in suited for articles made of ground glass as it is susceptible to erosion. One must avoid using abrasive substance (a rough substance used for cleaning a surface to make it smooth) while cleaning glass articles as it may cause scratches.

It is important to rinse glass articles under running cold water immediately after use in order to remove organic matter that may be stuck to their surfaces. Besides, it prolongs their life.

Glassware articles used for parenteral therapy must be cleaned with distilled water. After washing a glassware piece with distilled water, if an unbroken film is noticed on the surface, then it means it is clean. If there is grease or dirt, the film will be broken, forming droplets. For sterilising, glass vessels and articles need to kept in an inverted position in an autoclave machine. When glass articles are sent for boiling or autoclaving, appropriate precautions must be taken to protect them from breakage, which may occur, if they get rubbed against hard surfaces.

Upkeep of stainless steel utensils

These are widely used in hospitals as they are unbreakable, easy to clean and handle, and heat resistant. After use, the utensils must be washed in cold water, and then, cleaned with a detergent and lukewarm water. They must be immediately dried with a dry cotton cloth as water present on them leaves a mark.

Upkeep of crockery and cutlery pieces

Crockery and cutlery pieces used for patients must first be rinsed in cold water, and then, cleaned with a detergent and lukewarm water. They may also be disinfected by boiling.

Upkeep of linen

It is important to take care of linen used in the hospital. The following rules need to be followed for the maintenance and upkeep of linen.

- All linen items must be labeled (to prevent loss) and arranged appropriately in a cupboard.
- The cupboard must be locked when not in use.
- It must be ensured that linen pieces are not taken away by patients on discharge.
- Stocks must be checked regularly for replenishment, if needed.
- Losses must be reported promptly to the authorities concerned.
- Damp linen must be dried immediately, and then, sent to the laundry for washing.
- Stains on a linen need to be removed immediately. It is only after the stains are removed that the linen may be sent to the laundry for washing.
- Linen used for a patient must be appropriately disinfected before being sent to the laundry for washing.

Guidelines for removal of stains

- Note the type and colour of the stained linen, and nature of the stain.
- Try to remove the stain using an appropriate method. One may put the stained area (on the linen) under running cold water or use a suitable stain remover.
- Stains, containing protein content like blood, excreta, milk, pus, etc., are coagulated by the application of heat. For removing such stains, the articles must be soaked in cold water for some time (say, half-an-hour to one hour).
- If the stain contains fatty material, hot water and detergent may be used.
- Medicine stain may be treated with water (at room temperature) or methylated spirit, as many drugs are soluble in methylated spirit and water.

NOTES

- Quick application of absorptive items like salt, starch or borax prevents a liquid that has spilt on to a linen from spreading, reducing damage to the linen.
- Bleaching agents like lemon juice, Hydrogen peroxide and bleaching powder may also be used to remove certain stains.
- Boiling water may also be used to remove a stain. All one needs to do is stretch the stained part and pour boiling water with force over it until the stain starts disappearing.
- When using an acid like Oxalic acid, Acetic acid, etc., stretch the stained part over a bowl, containing boiling water, and apply the acid using a medicine dropper. When the stain disappears, rinse the cloth thoroughly under running cold water.
- A mixture of Hydrogen peroxide solution and diluted Ammonia may also be used for removing stains on linen. One needs to take equal measures of Hydrogen peroxide solution and diluted Ammonia to prepare a mixture. This mixture must be spread over the stained area and not removed until the stain disappears. This is, particularly, useful in case of woolen linen.
- Strong chemicals are rarely used as they are injurious in nature.

Cleaning bloodstains

For removing bloodstains from a linen piece, one needs to soak it in cold water immediately. One must not use hot water as it coagulates the stain, leaving a mark. After the stain has faded slightly, the linen must be soaked in warm soapy water. If it is an old bloodstain, then one needs to soak the linen in a mixture of Hydrogen peroxide and diluted Ammonia for a couple of hours, and then, wash it in cold water. At last, the linen needs to be washed with a detergent and warm water. For thick bloodstains on a mattress, one must apply a paste of starch powder and water, and put it in

the Sun for the paste to dry. When the paste dries and the stain looks discoloured, one may brush it off.

Cleaning tea and coffee stains

If a linen piece is stained with tea, coffee or cocco, then one must pour milk over it. Washing it in cold or hot water and Sodium carbonate also helps remove the stain. If the stain does not disappear completely, lemon juice or Hydrogen peroxide solution may be applied over it.

Practical Exercise

Activity

You have studied about different type of materials used for cleaning articles, tools and equipment in a hospital. Visit the housekeeping and laundry service department of a nearby hospital and see how the following articles are cleaned. Write the procedures followed for cleaning each of these articles in a notebook and share it with the class.

(i) Rubber gloves
(ii) Mackintosh
(iii) Rubber tubing
(iv) Enamelware
(v) Bedpan
(vi) Kidney tray
(vii) Sputum cup
(viii) Glassware
(ix) Stainless steel utensils
(x) Bloodstained linen

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Fill in the Blanks

1. Pour _____ to clean tea or coffee stain from a linen.
2. _____ utensils can be easily cleaned, are heat resistant and unbreakable.
3. Sharp instruments in a hospital are autoclaved at a temperature of _____ for _____ minutes.
4. Some of the commonly used bleaching agents are _____, _____ and _____.

B. Match the Columns

A Articles		B Cleaning method	
(i)	Rubber gloves	(a)	Disinfecting solution
(ii)	Bedpan	(b)	Mild soap and cold water
(iii)	Crockery and cutlery pieces	(c)	Detergent and lukewarm water
(iv)	Mackintosh	(d)	Steam under pressure

C. Short Answer Questions

1. Discuss the process of removing bloodstains from a bed linen.
2. Write a note in 150–200 words on the upkeep of rubber tubes.
3. List two precautions that one must take while cleaning glassware.

Unit 3

Community Health Care

Community health care focuses on a healthy populace. Community health care programmes aim to assess and diagnose the health needs of individuals, families and communities, and promote health by preventing the occurrence of diseases (both infectious and non-infectious). Preventive health care practices are not limited to vaccination or quarantine (isolation) but include identification of nutritional deficiencies, screening of diseases, problems emerging due to population growth in developing countries, etc.

The World Health Organization (WHO) defines community health as, "environmental, social and economic resources to sustain emotional and physical well-being among people in ways that advance their aspirations and satisfy their needs in their unique environment." Therefore, the WHO's goal is to attain 'health for all'.

The health status of a community is measured through various factors that help monitor and evaluate existing health care programmes. The commonly used indicators to analyse the health status of a community are morbidity and mortality rate, disability rate, socio-economic indicators, etc.

'Primary prevention' is important for ensuring community health. It focuses on preventing a disease from occurring in the first place and incidence of new cases. This can be attained by providing adequate nutrition, encouraging regular exercises, ensuring regular health check-ups, etc. Besides, people must be made aware of the importance of maintaining personal hygiene, and abstaining from unhealthy practices like smoking, drinking, overeating, etc. Promotion of health initiatives and carrying out vaccination drives also protect community members from contracting infections and diseases. Therefore, primary prevention relates to preventing the occurrence of a disease in the 'pre-pathogenesis phase'.

Secondary prevention refers to early diagnosis and prompt treatment during the pathogenesis phase. The aim is to cure patients and limit the impact of an illness.

Tertiary prevention focuses on limiting the disability so that a person is able to adjust back in society.

This Unit discusses communicable diseases, immunisation, taking care of the elderly and children, and principles of drug administration.

SESSION 1: INTRODUCTION TO COMMUNICABLE DISEASES

Communicable diseases are caused by viruses or bacteria that spread from one person to another, and on contact with contaminated surfaces, infected person's blood, pus or sputum, insect bites and air. Few examples of communicable diseases are malaria, tuberculosis, cholera, leprosy, filariasis, measles, chickenpox, trachoma, venereal diseases, enteric fever, viral hepatitis, diphtheria, whooping cough, tetanus, poliomyelitis, helminthes infestations, etc. These are some of the major causes of morbidity and mortality in India.

But most of these diseases may be prevented in a community by improving hygiene (including personal hygiene) and sanitation standards, providing safe drinking water facility, ensuring appropriate disposal of

different types of waste (including human and animal excreta), and carrying out immunisation and health awareness drives.

Infection causing agents

- Bacteria
- Viruses
- Protozoa
- Fungi
- Helminthes

Infection

It is characterised by the entry and multiplication of a biological agent (disease causing organisms) in humans and animals. An infection may be communicable or non-communicable in nature. Infectious diseases may be treated easily, if detected at an early stage. In fact, many countries have either controlled or eradicated a number of such diseases like diarrhoea, dysentery and respiratory infections.

Diseases caused by an infection depend on various factors, which are as follows.

- Virulence of the infective agent
- Dose of the infective agent
- Body's defensive mechanism
- Presence of an underlying disease (e.g., diabetes mellitus, cancer and blood diseases, such as anaemia, leukemia, etc.)
- Use of steroids and cytotoxic drugs

Infection symptoms

An infection occurs when other organisms or microbes enter the body and start multiplying. Organisms causing infections include viruses, bacteria, fungi and parasites. Few common symptoms of infection are fever accompanied by chills, body ache and fatigue, coughing or sneezing, nausea, vomiting and diarrhoea.

Fever

It is one of the most common symptoms of infection present in a person. Fever, in case of an infection, is, usually, sudden and associated with chills and rigour (shaking of the body). It is characterised by increase in the body temperature. The temperature, in case of an infection, is 37.2°–41.1°C (99°–106°F). It depends on the biological agent causing the infection. The normal body temperature of an adult when taken in the mouth is 37° C (98.6° F), whereas, it is 36° C (98° F) in the armpit.

Fever associated symptoms

Body pain and fatigue: Body pain, headache and fatigue are common fever associated symptoms.

Rise in the pulse rate: The normal pulse rate in an adult is 60–80 beats per minute and is counted at the wrist for at least one minute. With a rise in the body temperature, the pulse rate also tends to shoot up. However, this may not always hold true in case of viral infection or typhoid. The pulse may be slow in these cases. The normal respiratory rate in an adult is 16–20 respirations per minute. The breathing may be fast, especially, in case of high fever.

Infectious agents

An infectious disease occurs when there is a direct contact between a disease causing agent(s), or the disease carrier and the host. It also occurs because of various internal or external environmental factors. The course of this contact, which causes the disease, is called 'pathogenesis'. The agent may be any disease causing mediator, e.g., biological (bacteria, fungi, viruses, etc.), nutritional (anaemia, malnutrition, etc.), physical (heat, cold, humidity, etc.), chemical (may be released by the body or produced by outside agents) and social (poverty, substance abuse, etc.).

Modes of transmission

Direct transmission

Direct contact: The disease causing agent is transmitted directly from an infected person to a susceptible host during physical contact, causing an infection.

Saliva droplets: When a person coughs, sneezes or talks loudly, saliva droplets and nasopharyngeal secretions are sprayed into the atmosphere, which may be infectious.

Contact with infected soil: This means direct exposure of susceptible tissues to an agent present in the soil, e.g., tetanus.

Animal bite: It may also cause infections. One such example is rabies, which is caused by the bite of a rabid dog.

Indirect transmission

Vehicle-borne transmission: This means transmission of disease causing agent(s) through water, food, milk or milk products, ice, serum and plasma, or other biological agents. Water is the most common vehicle for transmission of infectious diseases. Examples of such diseases include cholera, typhoid, poliomyelitis, viral hepatitis, food poisoning, intestinal parasitic infestations, etc.

Vector-borne transmission: Vectors are arthropods (mosquitoes, flies, fleas and ticks), who carry the disease causing agent(s) on their bodies. These living organisms can, thus, transmit infectious pathogens between humans, or from animals to humans. These agents can transmit a disease only after reaching a certain stage of development. Few examples of vector-borne diseases are amoebic dysentery, chickenpox, diphtheria, viral hepatitis, eye infections, dengue, malaria, chikungunya fever, zika virus fever, yellow fever, Japanese encephalitis, tick-borne encephalitis, etc. However, many vector-borne diseases may be prevented by adopting certain preventive measures and carrying out community mobilisation programmes.

Air-borne transmission: When a person coughs, sneezes or talks, some saliva droplets are expelled from the mouth in the atmosphere. Some of these droplets evaporate soon, while some remain in the air for a longer period, causing air-borne infections. Some saliva droplets even settle on the floor or clothing, which may cause infections. This type of transmission is common in tuberculosis, pneumonia, strepto, staphylococcal infections, etc.

Protecting the populace

People may be protected against catching various diseases by following these measures.

- Active immunisation
- Passive immunisation
- Chemoprophylaxis
- Health education

Practical Exercise

Activity

Visit a nearby community health centre and prepare a list of five infectious diseases that it has received in the past five years. Also, try to find out their causative agents.

Material required: PPE kit, sanitiser and writing material

S. No.	Infectious disease	Number of cases	Causative agent	Year
1.				
2.				
3.				
4.				
5.				

Check Your Progress

A. Fill in the Blanks

1. The entry of a biological agent in a human body is called a/an _____.
2. A common symptom, indicating the presence of an infection in a person's body is _____.
3. In _____ transmission, a disease causing agent is transmitted directly from an individual to a susceptible host during physical contact.
4. _____ is the most common vehicle for transmission of infectious diseases.

B. Short Answer Questions

1. What is infection? List two symptoms of infection.
2. What are the various modes of transmission of infections?
3. List any two ways to check the spread of an infection.

SESSION 2: IMMUNISATION

Immunisation refers to the process that strengthens a person's immune system, protecting one against several infections and diseases. It not only protects one person but also the entire community by reducing the spread of infectious diseases. In simple words, 'immunisation' is the process of administering a vaccine into a person in order to protect one against a certain infection or disease. Vaccines are administered orally, nasally or through injection. Immunisation is also known as 'vaccination'.

In the process of immunisation, a vaccine, containing the same germ (in killed or weakened state) that causes an infection, is administered into a person's body. Since the germ present in the vaccine is killed or in a weakened state, the person develops immunity against the infection as antibodies are produced in the body. These antibodies help the body to fight against the infection. These antibodies stay in the body for a long time.

Fig. 3.1: Immunisation kit

Advantages of immunisation

- If a person is immunised against a certain infection, there is less chance of contracting that infection. It, thus, prevents the spread of that infection or disease caused by it.
- Immunisation helps save the time and money of people by protecting them from catching some infections, apart from keeping them healthy.
- Immunisation reduces the incidence of childhood diseases and makes children healthier. The Pulse Polio Immunisation programme has helped eradicate polio from India.
- Immunisation programmes bring down the mortality rate considerably, thereby, increasing the average life span of people.

Immune response

When an antigen is administered into a person for the first time, it is called 'primary' response. When this antigen is administered again, it is called 'secondary' or 'booster' response.

In primary response, there is a latent period of 3–10 days before antibodies start forming. After this period, there is antibody production for 2–3 days. However, the rate of antibody production starts declining gradually.

In secondary or booster response, the latent period is shorter than primary response. Moreover, the antibodies produced are present in the body for a longer duration. Hence, the body gets more protection against a disease after the secondary response.

It is because of this reason that in case of some diseases, more than one dose of a vaccine is administered to a person at specified intervals.

Antigen is a foreign substance that is introduced into a human body to stimulate the production of a specific antibody.

Antibody is the protein produced in the body due to the invasion of an antigen.

Immunity

It is the ability of a body to recognise, destroy and eliminate antigenic foreign material. A person becomes immune against a disease only when one possesses specific protective antibodies because of previous infection or immunisation or both. Thus, when someone is immune to a specific infectious agent, the person is protected against the disease it may cause when the agent invades the body.

Types of immunity

Innate, basic or inherited immunity

In this case, an individual possesses genetic or natural immunity, i.e., the immunity one is born with.

Acquired immunity

Also known as 'adaptive' immunity, it develops when a person's immune system responds to a foreign substance or microorganism. In simple words, it is the resistance to diseases that a human being acquires during one's lifetime.

Active immunity

An individual develops such an immunity as a result of contact with pathogenic organisms or their products. In this case, the body is stimulated to produce antibodies. This immunity is specific for a particular disease for example, measels, polio, diphtheria, etc. Active immunity may be acquired through the following ways.

- Naturally, after getting infected by an organism
- Artificially through the administration of vaccines

Passive immunity

Such an immunity occurs as a person receives immune components, i.e., antibodies, from another person. Passive immunity provides immediate protection. It lasts only for a few weeks or months, unlike active immunity, where the immunity lasts for a longer period or may be even one's lifetime. Therefore, passive immunity, makes the individual susceptible to catching a certain infection again. Passive immunity

develops naturally like a newborn receives antibodies from one's mother through the placenta or breast milk, or artificially when a person receives antibodies through some infection.

Table 3.1: Difference between Active and Passive Immunity

	Active Immunity	Passive Immunity
Antibodies	Produced within the body	Introduced from outside of the body
Results from	• Infection • Vaccination	• Breast milk • Placenta • Injection
Takes effect	Over time (typically, several weeks)	Immediately
Length of efficacy	Long-term or lifelong	Short-term (few weeks or months)

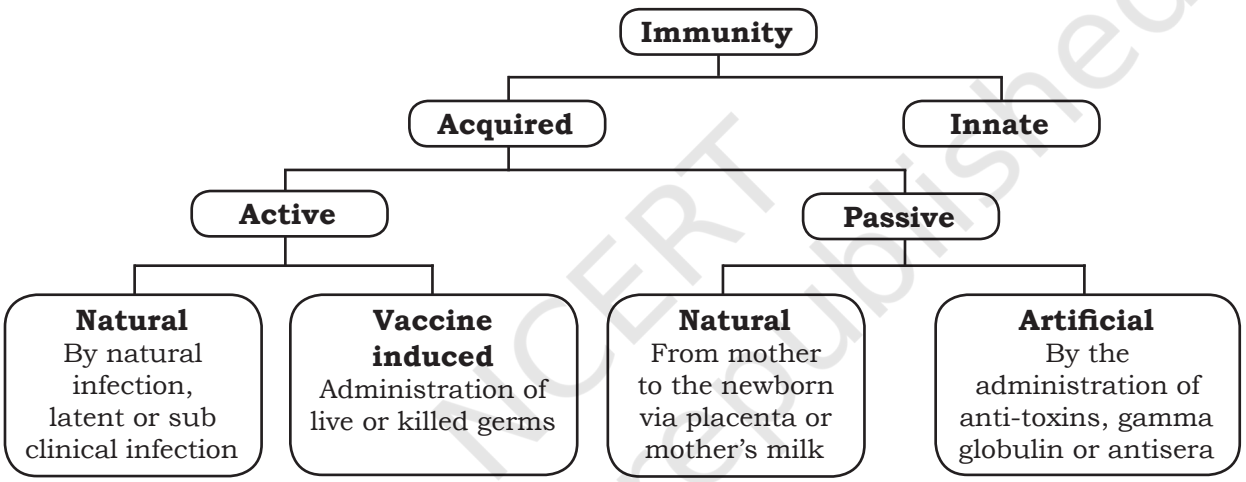

Fig. 3.2: Types of immunity

Health education

Some diseases may be prevented, if there is awareness among people and personal hygiene and sanitation standards are maintained. The knowledge of cause, spread and effect of certain diseases, and the cooperation of people or community members may help check their spread. Multipurpose workers, and health and education volunteers play an important role in controlling the spread of various diseases. They conduct health awareness drives like door-to-door campaigns, in which they visit different households in a community, and educate people about various communicable and non-communicable diseases, and also share measures to prevent their spread.

Vaccine

It is a biological preparation that provides active acquired immunity to a person against a specific infectious disease. When administered, it helps the recipient's body develop or form specific antibodies. Vaccines have the following characteristics.

- There is a specific vaccine for every communicable disease. Therefore, a vaccine protects a person only from a particular disease.
- A vaccine, typically, contains an agent, resembling a disease causing microorganism. It is, usually, made of weakened or killed form of a microbe, its toxins, or one of its surface proteins.
- The administration of a vaccine stimulates the body to produce antibodies, providing immunity and protecting it against a particular disease. Hence, the body reacts to the antigen like prior to the administration of the vaccine but illness does not occur.
- In some cases, one dose of a vaccine is sufficient for primary protection, whereas, many may require two or more (booster or repeat) doses at specified intervals to retain and increase the immunity.
- All vaccines have a limited shelf life. So, they become ineffective after some time.
- Vaccines are destroyed, if exposed to heat. Therefore, they need to be stored at specified low temperatures.

Types of vaccine

Live vaccines

These are preparations from live attenuated organisms. They are potent immunising agents, for example, oral polio, rabies, yellow fever and measles and BCG (Bacillus Calmette–Guérin) vaccines. The BCG vaccine is used for treating tuberculosis.

Killed vaccines

Organisms killed by heat or chemicals, when injected into a body, stimulate it to produce active immunity, for example, vaccines against cholera, typhoid, whooping cough, etc. They are not as efficient as live attenuated vaccines. Therefore, two to three doses are administered to increase the antigenic efficiency.

Toxoid preparations

Certain organisms produce exotoxins (structural component of a causative organism), for example, diphtheria and tetanus bacilli. These toxins are detoxified (rendered harmless) to prepare vaccines, which are called 'toxoids'.

Polyvalent vaccines

These refer to vaccines prepared by the culture of two or more strains of the same species, for example, polio and influenza vaccines.

Combined or mixed vaccines

When more than one kind of immunising agent is present in a vaccine, it is called 'combined' or 'mixed' vaccine, for example, DPT, TABC, MMR, etc.

Cold chain

Vaccines are highly perishable in nature. These are easily destroyed or lose potency, if exposed to heat and light. Therefore, they have to be stored and transported at specific low temperatures. The system of storing and transporting vaccines at low temperatures is called 'cold chain'. However, even under these conditions, the shelf life of the vaccines is limited.

DPT, DT, TT and typhoid vaccines must always be stored in a refrigerator but never in the freezer. Vaccines must never be kept in the door of the refrigerator. During transportation, it is important to keep the vaccine containers on dry ice (solid Carbon dioxide). However, it must be noted that some vaccines are stored in freezer. Such vaccines when taken out of the freezer once must never be stored in the freezer again. So, only one vial of such a vaccine must be taken out at a time in order to check wastage. If the vaccine is put in a flask, containing ice, it must be kept there for only two to three hours.

Universal Immunisation Programme

The programme was introduced in India in the year 1978 as 'Expanded Programme of Immunisation' (EPI) by the Ministry of Health and Family Welfare, Government of India (GOI). In 1985, it was modified as 'Universal Immunisation Programme' (UIP) to be

implemented in a phased manner that would cover all districts of the country by 1989–90.

The Ministry of Health and Family Welfare provides several vaccines to infants, children and pregnant women through UIP. The diseases protected by vaccination under UIP include diphtheria, pertussis (whooping cough), tetanus, polio, tuberculosis, measles, hepatitis B, Japanese encephalitis, meningitis and pneumonia (caused by haemophilus Influenza type–B).

Vaccines under UIP

BCG vaccine

- It is administered to infants to protect them against tuberculous meningitis and disseminated TB.
- The vaccine is administered a few days after birth. However, it may be given till 1 year of age.
- It is administered by way of intradermal injection in the left upper arm.

Oral polio vaccine

- It protects children from poliomyelitis.
- The first dose of the vaccine is given at birth or within 15 days after birth. It is called 'zero dose'. Subsequently, three doses are given at 6, 10 and 14 weeks. Booster doses are given to a child till five years of age.
- The vaccine is given orally in the form of two drops.

Fractional inactivated poliomyelitis vaccine

- It is also administered to boost protection against poliomyelitis.
- Two fractional doses of the vaccine are administered through the the intradermal route at 6 and 14 weeks after birth.
- The injection is given in the right upper arm.

Hepatitis B vaccine

- It protects a person against Hepatitis B infection.
- The vaccine is administered within 24 hours after birth. Subsequently, three doses are given at 6, 10 and 14 weeks in combination with DPT and Hib in the form of pentavalent vaccine.

- Intramuscular injection is given in the antero-lateral (both anterior and lateral) side of mid thigh.

Pentavalent vaccine

- It is a combined vaccine to protect children from five diseases — diptheria, tetanus, pertussis, haemophilis influenza type b and hepatitis B.
- Three doses are given at the age of 6, 10 and 14 weeks (it may be given till one year of age).
- The vaccine is administered through the intramuscular route in the antero-lateral side of mid thigh.

Rotavirus vaccine

- It protects infants against rotavirus diarrhoea. It is given in select States of the country.
- Three doses of the vaccine are given at 6, 10 and 14 weeks after birth. It may be given to a child till one year of age.
- Five drops of the liquid vaccine or 2.5 ml (lyophilised vaccine) are given orally.

Pneumococcal Conjugate Vaccine (PCV)

- It protects infants against a disease caused by Streptococcus pneumoniae bacterium.
- The vaccine is given as two primary doses at 6 and 14 weeks after birth, followed by a booster dose at 9–12 months of age.
- It is given as intramuscular injection in the antero-lateral side of mid thigh. It must be noted that pentavalent vaccine and PCV are given as two separate injections in opposite thighs.

Measles or MR vaccine

- Measles and rubella (MR) vaccine is administered to protect children from measles and rubella.
- The first dose is given at 9–12 months of age, while the second is given at 16–24 months. However, the vaccine may be administered to a child till five years of age.
- It is administered through subcutaneous injection in the right upper arm.

Japanese Encephalitis (JE) vaccine

- This vaccine is given in select districts endemic for JE.
- It is given in two doses. The first dose is given at 9–12 months of age, while the second is administered at 16–24 months.
- Live attenuated vaccine is administered through subcutaneous injection in the left upper arm, while killed vaccine is administered as intramuscular injection in the antero-lateral side of mid thigh.

DPT booster

- It is a combination vaccine that protects children against diphtheria, tetanus and pertussis.
- It is given in two doses. The first dose is administered at 16–24 months of age, while the second is given at 5–6 years.
- DPT first dose is given as intramuscular injection in the antero-lateral side of mid thigh in the left leg, while the booster or second dose is given as intramuscular injection in the left upper arm.

Tetanus and adult diphtheria (Td) vaccine

- The vaccine is administered to pregnant women and adolescents aged 10 and 16 years.
- Td–1 is given early in pregnancy as the first dose. Four weeks after Td–1, the second dose of Td (Td–2) is given. Td booster is given, if a woman has received 2 TT/Td doses during pregnancy within the last three years.
- Td vaccine is given as intramuscular injection in the upper arm.

Table 3.2: National Immunisation Schedule (NIS) for infants, children and pregnant women

Vaccine	Period of dosage	Dosage	Route	Site
For pregnant women				
TT-1	Early in pregnancy	0.5 ml	Intramuscular	Upper arm
TT-2	Four weeks after TT–1*	0.5 ml	Intramuscular	Upper arm
TT-booster	If a woman has received two TT doses during pregnancy in the last three years*	0.5 ml	Intramuscular	Upper arm

For infants				
BCG	Few days after birth or as early as possible till one year of age	0.1 ml (0.05 ml until 1 month of age)	Intradermal	Left upper arm
Hepatitis B — birth dose	Within 24 hours after birth	0.5 ml	Intramuscular	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 and 3	At 6, 10 and 14 weeks (OPV is given till 5 years of age)	2 drops	Oral	Oral
Pentavalent 1, 2 and 3	At 6, 10 and 14 weeks (may be given till one year of age)	0.5 ml	Intramuscular	Antero-lateral side of mid thigh
Rotavirus#	At 6, 10 and 14 weeks (may be given till one year of age)	5 drops	Oral	Oral
IPV	Two fractional doses at 6 and 14 weeks of age	0.1 ml	Intradermal: two fractional doses	Intradermal: right upper arm
Measles /MR First dose$	9–12 months (may be given till 5 years of age)	0.5 ml	Subcutaneous	Right upper arm
JE – 1**	9–12 months	0.5 ml	Subcutaneous (live attenuated vaccine) Intramuscular (killed vaccine)	Left upper arm and antero-lateral side of mid thigh
Vitamin A (1st dose)	At 9 months for measles and rubella	1 ml (1 lakh IU$)	Oral	Oral
For children				
DPT booster-1	16–24 months	0.5 ml	Intramuscular	Antero-lateral side of mid thigh in the left leg
Measles/ MR second dose$	16–24 months	0.5 ml	Subcutaneous	Right upper arm
OPV booster	16–24 months	2 drops	Oral	Oral
JE-2	16–24 months	0.5 ml	Subcutaneous	Left upper arm
Vitamin A*** (2^{nd} to 9^{th} dose)	16–18 months; then, one dose every 6 months up to the age of 5 years	2 ml (2 lakh IU)	Oral	Oral
DPT Booster-2	5–6 years	0.5 ml	Intramuscular	Left upper arm
TT	10 and 16 years	0.5 ml	Intramuscular	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 is introduced in routine immunisation in 181 endemic districts.
***The second to ninth doses of Vitamin A may be administered to children aged 1–5 years during biannual rounds, in collaboration with the Integrated Child Development Services (ICDS).
#Phased introduction in Andhra Pradesh, Haryana, Himachal Pradesh and Odisha from 2016; development services expanded in Madhya Pradesh, Assam, Rajasthan and Tripura in February 2017; planned in Tamil Nadu and Uttar Pradesh in 2017
$Phased introduction in five States and Union Territories, namely Karnataka, Tamil Nadu, Goa, Lakshadweep and Puducherry (as on February 2017)
δInternational Units
Source: Ministry of Health and Family Affairs, Government of India

Poliovirus

It is the causative agent of polio (also known as poliomyelitis). Poliovirus is a serotype of the species Enterovirus C — type 1, 2 and 3. All three types cause paralysis. Type 1 is the most common cause of paralysis.

Polio is a communicable disease having an incubation period of 7–10 days. Poliovirus is transmitted directly from one person to another via the faecal–oral route; i.e., it multiplies in the intestines and is spread through the faeces. The virus is intermittently excreted by the infected person for one month or more after catching the infection. The disease is contagious mostly prior to the onset of paralysis and two weeks after paralysis.

Pulse Polio Immunisation programme

India launched the Pulse Polio Immunisation (PPI) programme in the year 1995 with the assistance of WHO's Global Polio Eradication Initiative to eliminate poliomyelitis (polio) from the country. As part of the programme, all children below five years of age are given two doses of Oral Polio Vaccine (OPV) in December and January every year. The programme helped India achieve a polio free status on 27 March 2014. Various international institutions, State governments and non-governmental organisations carry out polio immunisation drives throughout the year to eradicate the virus.

Fig. 3.3: Polio drops being administered to an infant

Check Your Progress

A. Fill in the Blanks

1. _____ is defined as the ability of the body to recognise, fight against and destroy antigenic foreign material.
2. The administration of a _____ stimulates the body to produce _____.
3. Diseases protected by vaccination under the _____ are diphtheria, pertussis, tetanus, polio, tuberculosis, measles, hepatitis B, etc.
4. The system of storing and transporting vaccines at low temperatures is called _____.
5. India launched the _____ immunisation programme in 1995.

B. Short Answer Questions

1. Write a short note on immunity and its types.
2. What is the importance of immunisation?
3. Discuss cold chain.

Session 3: Basic Needs of the Elderly

The population of a country is its most significant demographic indicator. The elderly population in India has been increasing steadily since 1961. This increase in the elderly population is mainly due to decrease in the mortality rate and various health interventions introduced after Census 1981. The addition of the elderly population during 2001–11 was more than 27 million. According to the *Report of the Technical Group on Population Projections for India and States* 2011–36, there were nearly 138 million elderly persons in India in 2021, comprising 67 million males and 71 million females (*Elderly in India*, National Statistical Office, Ministry of Statistics and Programme Implementation Report 2021, Government of India).

A General Duty Assistant (GDA) and other health care workers need to take extra care of elderly patients undergoing treatment in a hospital.

This Session gives insight to the various needs of the elderly like communication, safety and security, and nutrition and health, among others.

Communicating with an elderly patient

- Help the person wear the eyeglasses and fix the hearing aid, if required.
- Look at the person while talking. Looking in other directions may make the person feel that the caregiver is disinterested.
- Listen carefully to the patient's problems.
- Speak slowly and clearly. Keep the information short and simple.
- Use words that the patient can understand easily.
- Use pictures and large print material while communicating.
- Ensure that there is enough light in the room.
- Repeat the information often so that the patient can understand and remember it.
- Be calm and patient while communicating as some may take longer to understand.
- Make sure that the area or room, where the patient is admitted, is noise free.
- Encourage the person to talk and ask questions.
- Include the person's relatives or caretakers while communicating.

Communication needs

Special care must be taken while communicating with older patients as they mostly deal with physical and mental problems, which may interfere with their thinking and comprehension process. Older adults may show the following attributes.

Short attention span

Many a time, it has been observed that older adults are unable to remember instructions as given by caregivers like doctors, nurses and ward staff. This is due to their attention span, which has been adversely affected with age. Therefore, short and repeated instructions must be given to them so that they are able to remember those.

Reduced learning ability

Many elderly people may not be able to learn new things like they were able to do earlier.

Inability to communicate

Speech is adversely affected, especially, after an elderly person suffers a stroke or some other chronic medical ailment. Some of the causes of speech disorder are muscle weakness, brain injury, etc.

Poor vision and reduced aural ability

Vision and hearing, too, get adversely affected in old age. Therefore, the GDA and other health care workers must be patient with elderly patients. They must help them put on their eyeglasses and fix the hearing aid, if required, so that they are able to communicate easily and effectively.

Safety and security needs

Older persons may experience various anatomical and physiological changes. These changes, usually, lead to many psychological, behavioural and attitudinal changes in them. Loss of physical strength and stamina intensifies as a person nears old age.

Physical problems, confusion, loss of hearing ability, poor vision and inability to sense a risk are some of the reasons for maintaining a safe environment for the elderly in hospitals.

Health care workers, including GDAs, must ensure that all patients and patient care areas are safe and free of all kinds of risk. Some of the points that GDAs and other health care workers must ensure while catering to elderly patients are as follows.

- Remove all fall hazards. Falls are a major cause of injury among senior citizens.
- Ensure that all emergency helpline numbers are handy.
- Ensure that the ward areas and bathrooms are dry to check slips and falls.
- See to it that a toilet safety rail is installed in all bathrooms, especially, those meant for senior citizens.
- Provide slip resistant slippers to the patients.
- Ask older patients to use assistive devices and provide walkers, walking sticks or wheelchairs to them, as and when required.
- Ensure that there is adequate lighting in wards, bathrooms and other hospital areas.
- See to it that all signboards and indicators in the hospital are strategically placed. The indications on signboards should be written in bold and clear font. They should be legible from a distance.

Nutritional needs

The dietary and nutritional needs of a person change with age. The body's requirement for calories, usually, decreases as a person approaches old age. Elderly people, generally, have a reduced appetite. Their digestive process also slows down with age. The bones, too, start weakening. Therefore, the elderly need more calcium and vitamin D to maintain their bone health. Besides, they must be encouraged to go for health check-ups every six months or whenever they face a health problem, even if it is a minor one.

Practical Exercise

Activity

Visit a nearby hospital. Observe how elderly patients are escorted and helped by health care workers, including GDAs. Elaborate on the safety and security measures in place in the hospital for the elderly. Prepare a write-up based on your observations and present it before the class.

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Fill in the Blanks

1. Elderly persons, usually, have a short _____ span.
2. Elderly people, generally, have a reduced _____ and a poor _____ health.
3. According to the *Report of the Technical Group on Population Projections for India and States* 2011–36, there were nearly _____ elderly persons in the country in 2021.
4. A GDA must keep the information _____ and _____ while communicating with an elderly person.

B. Short Answer Questions

1. List five measures that health care workers need to take for ensuring the safety of elderly patients in a hospital.
2. Discuss how a GDA must communicate with an elderly patient.

Skin problems among the elderly

- Skin tears and breakdowns (thin, dry and fragile skin)
- Skin cancer and sunburns (pale and fragile skin is prone to sunburns and cancer)
- Rashes, infections and allergies due to the use of soaps with a high pH level
- Itchiness
- Pressure ulcers, in case a person becomes bedridden

Session 4: Taking Care of Common Problems of the Elderly

This Session discusses some of the common health problems that the elderly face and measures that a GDA needs to adopt in order to take care of them.

Common skin problems

As a person becomes older, the skin becomes thinner, dry, pale, rough, fragile and saggy due to the presence of lesser sweat glands and fat producing cells. Some of the skin problems that senior citizens, usually, face are as follows.

Senile purpura

Purplish spots are often noticed on an elderly person's limbs (arms and legs) due to thinning of the skin, and frailty of capillaries and blood vessels below the epidermis (the topmost layer of the skin).

Stasis dermatitis

It is characterised by dry and itchy skin, which is more common in elderly women than men.

Exfoliative dermatitis

It is characterised by excessive shedding of the skin. It is of concern among the elderly as it causes severe itching, which may lead to infections.

Skin infections

Bacterial infections and parasitic infestations like scabies or ringworm are common in elderly people.

Viral skin disorders

Few examples of such disorders include shingles and herpes zoster.

Skincare for the elderly

Some of the measures that a GDA must adopt while providing skincare to the elderly are as follows.

Giving bath and lotion application

The GDA must use a mild soap and a soft washcloth (to give gentle strokes) while giving bath to an elderly person. One must wash the body carefully after applying soap, so that no trace of soap is left on the body as it may cause irritation or allergy. The GDA must, then, gently dry the person's body using a soft cotton towel. One must not forget to apply lotion on the person's body after giving a bath. Lotion keeps the skin moisturised, healthy, soft and supple. One must never use an alcohol based lotion on the skin as it dries the skin, making it susceptible to tears and breakages.

Avoid gripping tightly

One must not grip or hold an elderly person tightly during transfer as it may cause skin tears or breakages. One needs to be extra cautious while handling bedridden patients, who may be suffering from pressure ulcers as they are painful and may even secrete pus, if the patient is manhandled.

Keep the skin clean and dry

All soiled or dirty linen and clothing must be removed from the patient's body immediately. One should never let the patient remain wet and dirty with urine, faeces or other liquids, including water or tea. The patient's body must be cleaned with a mild soap, washed, and then, dried with a soft cotton towel. The patient may also be given a sponge bath. A lotion must be applied on the body after this.

Nail care

Elderly patients need assistance in cutting of nails. Their nails must be cut to the skin every week and kept clean and smooth. Dirty fingernails lead to infections, whereas, rough and jagged fingernails may cause injury. Nail care is rendered best when a person is made to sit on a chair. If the person is not able to sit on a chair, the nails may be cut in the bed.

Points to note

- Elderly patients like others, who are bedridden, must be moved and re-positioned every two hours.
- Do not elevate the head panel of the bed by more than 30 degrees, unless instructed by the attending or supervising doctor.
- Do not allow a patient to remain on the bedpan for more than 20–30 minutes.
- Do not drag a person's body along the bed sheet.

Muscle and bone care for the elderly

There is a decrease in muscle mass with age. The bones, too, get weakened in old age. Starting in thirties, the problem aggravates as one ages. Maintaining muscle health is of paramount importance as it makes the bones stronger and also improves balance, thus,

preventing falls. So, regular exercise and physiotherapy sessions are important to maintain and improve muscle and bone health. The GDA must help the patient do a range of exercises to ensure the functionality of one's muscles and bones. The GDA may teach the patient to climb up and down the stairs, holding the handrail.

Respiratory care

Chronic Obstructive Pulmonary Disease (COPD) is common in elderly patients. It is characterised by shortness of breath; wheezing; chest congestion; cough that produces clear, white, yellow or greenish mucus (sputum); frequent respiratory infections; lack of energy and weight loss. The treatment of older patients with COPD is challenging. Therefore, the GDA must see to it that all precautions required to maintain the respiratory health of elderly patients are followed. In case of flu, the GDA must observe the patient for cough, chest pain and blood in the sputum. One must immediately report such observations to the supervisory doctor or nurse and try comforting the person. The GDA must be careful while taking care of patients suffering from pneumonia (infection that inflames the air sacs in one or both the lungs). Its treatment includes administering drugs to kill germs that may be present in the lung(s); providing rest, oxygen, and a balanced diet that includes liquids (as recommended by the doctor); and ensuring patient pulmonary hygiene. The GDA must observe breathing in the patient and immediately report to the supervising doctor, if anything disturbing is observed.

Practical Exercise

Activity

Visit a nearby hospital and request the head nurse's permission to see some elderly patients admitted there. Observe their problems in the following areas. Also, take note of the care being rendered and fill in the table.

Material required: PPE kit, sanitiser and writing material

S. No.	Areas	Problem identified	Care rendered
1.	Skin		
2.	Nails		

3.	Muscles and bones		
4.	Nutrition		
5.	Respiration		

Check Your Progress

A. Fill in the Blanks

1. The full form of COPD is _____.
2. A GDA must apply _____ on an elderly patient's skin to reduce _____.
3. _____ is an infection that inflames the air sacs in one or both the lungs.
4. Regular _____ and _____ are important to maintain and improve muscle and bone health.
5. _____ occur in case a person becomes bedridden.

B. Short Answer Questions

1. List two common skin problems in elderly people. How would you take care of dry skin?
2. Discuss muscle and bone care for the elderly.
3. Write the activities that a GDA needs to perform while providing care to the elderly in the following areas.
   (i) Nails
   (ii) Skin
   (iii) Pressure ulcers

SESSION 5: FORMS AND ROUTES OF MEDICATION

Medicines come in many forms and are administered through various routes. Some medicines of the same concentration are available in more than one form and may be administered through more than one route. Therefore, the doctor's prescription for each patient must state the form and route of medicine administration, which must be followed strictly.

This Session discusses some of the common forms of medicine and routes for their administration.

Forms of medicine

Medicines are available in the following forms.

- Tablets
- Capsules (regular and sustained release)
- Elixirs

- Suppositories (vaginal and rectal)
- Oral suspensions
- Syrups
- Tinctures
- Ointments
- Pastes
- Creams
- Drops (ENT — Eyes, Nose and Ears)
- IV (intravenous) suspensions and solutions
- Metered dose inhalers

Complete order

A doctor or a nurse must write the complete order or prescription for administering medicines to a patient. A complete order must contain the following.

- Patient details (name, age, contact details, etc.)
- Supervisory or attending doctor
- Date of the order
- Time of the order
- Name of the medicine(s)
- Dosage of the medicine(s)
- Route of the medicine(s)
- Form of the medicine(s)
- Time or frequency of administration
- Signature of the doctor or nurse

Labels

All labels must consist of the following.

- Patient's name and age
- Name of the medicine(s) to be administered
- Form of the medicine(s)
- Strength of the medicine(s)
- Amount of the medicine(s) to be administered
- Route of administration
- Time of administration
- Date of the doctor's order or prescription
- Name of the doctor or nurse, who recommended the medicine
- Special instruction, if any, like storage conditions

Crushing the pill

A pill or tablet may be crushed and mixed with juice or water so that it is easier for the patient to gulp it down. Capsules may be opened and mixed with juice or water. Time release capsules, coated and effervescent tablets, medicines that may upset the stomach, medicines with a sour taste and sublingual medicines (those placed under the tongue) must not be opened or crushed. However, one must always check with the attending or supervising doctor if a medicine or capsule may be crushed or opened before doing so.

Medicine administration form and route (as per age)

Infants and toddlers

Liquid medicines are, generally, administered to infants and toddlers. The medicines are administered orally, using a syringe or a dropper.

Preschool children

Like toddlers, they, too, are administered medicines orally. Liquid medicines are administered to them using a spoon or cup. However, sometimes, they are also given pills or tablets that they need to swallow.

Adolescents

Patients in this age group (10 to 19 years, according to the World Health Organization) are able to swallow capsules and tablets. Therefore, they may be given all forms of medicine just like adults through various routes.

Routes of medicine administration

GDAs must observe doctors and nurses administering medicines to patients. This will enable them to assist medical practitioners in medicine administration, if required. The following are the common routes of medicine administration.

Topical

In this case, a medicine is applied directly onto the skin of a patient. It must be ensured that the skin is intact, i.e., there must not be any tear, cut or abrasion. Examples of topical medicines include lotions, creams, gels, pastes, ointments and powders. The step-by-step procedure for using the topical route is as follows.

(i) Wash the hands with an anti-bacterial soap and water before starting with medicine application.
(ii) Check the doctor's order or prescription and verify the medicine before applying it.
(iii) Check with the patient for allergies, if any.
(iv) Wear a set of disposable gloves before applying the medicine.

(v) Gently open or unscrew the medicine tube or container.

(vi) Keep the top portion of the tube upwards to ensure that the ointment does not drop.

(vii) Put the medicine on a spatula.

(viii) Clean the medicine tube's nozzle with a sterile cotton swab and screw (close) the cap tightly.

(ix) Apply the medicine in long strokes towards the direction of hair growth.

(x) Wash the hands appropriately with an anti-bacterial soap and water after applying the medicine.

Transdermal

The medicine is administered through the skin of a patient with the help of patches. The step-by-step procedure of administering transdermal medicine is as follows.

(i) Wash the hands with an anti-bacterial soap and water.

(ii) Check the doctor's order and verify the medicine before administering it.

(iii) Check with the patient for allergies, if any.

(iv) Wear a set of disposable gloves before starting with the procedure.

(v) Before putting on a transdermal patch, remove the old patch, if it is still there. Not removing the old patch may lead to overdose.

(vi) Clean the area appropriately. One may also apply the new patch at a new site that is clear, dry, hairless and free of skin irritation or allergy. Hairless surface ensures even spread of the medicine.

(vii) Put the dose on the patch or strip. The caregiver must ensure that the ointment does not touch one's own skin as it may cause allergy, irritation or itchiness.

(viii) Apply the patch by holding one hand firmly over it for 10 seconds. Then, press around the edges to ensure that it is securely attached to the skin. This prevents loss of the patch and ensures effectiveness of medication. Do not rub.

(ix) Cover the patch with a plastic wrap or special dressing and secure it so that it does not fall off.
(x) Record the date and time of dosage.
(xi) Wash the hands again with an anti-bacterial soap and water after applying the medicine.

Oral

This implies that a medicine is administered through the mouth. It is the simplest and most convenient way of medicine administration. No sterile precautions need to be followed, if a medicine is administered via this route. Some of the points that the GDA must take care of while administering a medicine orally to a patient are as follows.

(i) Wash the hands with an anti-bacterial soap and water before handing over the medicine to a patient.
(ii) Sanitise the patient's hands as well.
(iii) Check the doctor's order and verify the medicine before giving it to the patient to gulp it down.
(iv) Give water to the patient in case of a tablet or capsule so that it is easy to swallow the medicine.
(v) Stay with the patient till one gulps down the medicine.

Buccal and sublingual

'Buccal' administration refers to placing a medicine between the gums and the cheek of a patient, allowing it to dissolve with the saliva and get absorbed into the person's blood. 'Sublingual' administration entails placing a medicine under the patient's tongue, allowing it to dissolve with the saliva and get absorbed into the blood. Both sublingual and buccal drugs come in tablet, film or spray forms. Some of the points that the GDA must take into account in case of buccal and sublingual medicine administration are as follows.

(i) Wash the hands with an anti-bacterial soap and water before setting off to administering the medicine.
(ii) Sanitise the patient's hands as well.
(iii) Check the doctor's order and verify the medicine before giving it to the patient.

(iv) Tell the person to take the medicine accordingly as mentioned in the doctor's order, i.e., buccal or sublingual, and keep it there until it dissolves with the saliva.

(v) Ask the patient not to chew or swallow the medicine.

(vi) Check with the patient, if the medicine has dissolved.

Ophthalmic

This refers to the administration of drops into a patient's eyes, as recommended by an ophthalmolgist. The step-by-step procedure of administering ophthalmic medicine is as follows.

(i) Put on the gloves.

(ii) Help the patient sit appropriately or lie down in supine position, facing up. Ask the patient to tilt the head backwards, in case one is sitting. The patient must look up and away.

(iii) The caregiver must keep one hand steady against the patient's forehead while administering drops into the patient's eyes with a dropper.

(iv) After administering the eyedrops, ask the patient to close the eyes and not to blink as blinking spreads the drops.

(v) Give the patient a tissue paper to clean excess medicine.

Otic

In this case, a medicine (drops), as recommended by a doctor, is administered in the outer ear of a patient. It is used to treat infections and inflammation. Some of the points that the GDA must take care of while helping a nurse or a doctor administer medicines through the otic route are as follows.

(i) Wash the hands with an anti-bacterial soap and water or sanitise them appropriately. Now, put on a sanitised pair of gloves.

(ii) Check the doctor's order before administering the medicine.

(iii) Ensure that the ear drops to be used match the patient's body temperature.

(iv) Tell the patient to lie on one's side so that the ear, in which the medicine is to be administered, faces up.

(v) The GDA must straighten out the patient's ear canal by pulling the earlobe upwards and backwards as the doctor or nurse puts the drops against the side of the inner ear. The GDA must continue holding the earlobe in place until one is unable to see extra drops.

(vi) Tell the patient to keep one's head to the side for at least 10 minutes after medicine administration.

Inhaler

There are two types of inhaler — metered-dose and turbo inhaler.

Metered-dose inhalers

A metered-dose inhaler delivers a specific amount of medication into the lungs. It is the most common delivery system used in the treatment of asthma, COPD and other respiratory diseases. The steps for using a metered-dose inhaler on a patient are as follows.

(i) Wash the hands with an anti-bacterial soap and water, and dry them.

(ii) Sanitise the patient's hands as well.

(iii) Take a recommended metered-dose inhaler and shake the bottle.

(iv) Remove the cap.

(v) Ask the patient to breathe out and place the lips around the inhaler's mouth.

(vi) Ask the patient to press the inhaler against its mouth as one inhales slowly and deeply.

(vii) Ensure that the person holds one's breath for a few seconds before breathing out slowly.

(viii) Tell the person to take a mouthful of water and spit it out. This prevents one from mouth infection.

Turbo inhaler

Like metered-dose inhaler, turbo inhaler is also administered orally in asthmatic people aged six years and older. The steps for using a turbo inhaler on a patient are as follows.

(i) Turn the mouthpiece counter clockwise to unscrew it.

(ii) Put the medicine into the stem of the mouthpiece.

(iii) Tell the patient to breathe in deeply and hold the breath for a few seconds while the mouthpiece is in the mouth.

(iv) Ask the patient to repeat this step until all medicine in the inhaler is used.

(v) The patient can then rinse the mouth, if one likes.

Practical Exercise

Activity

Visit a ward in a nearby hospital. You would see patients of different age groups undergoing treatment. Identify the routes and form of drug administration for the following categories of patients and fill in the table.

Material required: PPE kit, sanitiser and writing material

Patients	Form of drug administered	Route of administration
Infants		
Toddlers		
Adults and adolescents		

Check Your Progress

A. Fill in the Blanks

1. _____ medicines are placed under the tongue.
2. Toddlers are, generally, administered medicines in _____ form.
3. The two types of inhaler are _____ and _____.
4. In _____ administration, a medicine is placed between the gums and the cheek.

B. Short Answer Questions

1. Name any five forms of medicine.
2. List any three characteristics of complete order.
3. Discuss the steps for using a metered-dose inhaler.

Unit 4

Biomedical Waste Management

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Biomedical waste, also known as 'hospital waste', 'medical waste' and 'regulated medical waste', refers to waste generated in hospitals, clinics, dispensaries, health centres, pathological laboratories and medical research facilities. Such materials may be contaminated and infectious. So, it is important to dispose biomedical waste appropriately.

This Unit describes biomedical waste, its sources, and management (segregation, transportation and disposal), and the role of various hospital staff in waste management. It needs to be underlined here that General Duty Assistants (GDAs) are involved in the segregation of wastes inside wards. So, they must have knowledge about different types of biomedical waste and their treatment.

Session 1: Introduction to Biomedical Waste

This Session gives an account of the sources of biomedical waste. It also describes the classification and categories of such waste as per the Biomedical Waste (Management and Handling) Rules, 2016.

Biomedical waste is generated as a result of diagnostic, therapeutic, immunisation and research activities carried out in hospitals, health care centres, clinics,

pathology labs, etc. It may be in solid or liquid state. Biomedical waste includes discarded blood; sharps; microbial cultures; human and animal organs; tissues; and foetuses; used bandages, dressings, syringes, needles and gloves; and other medical supplies in contact with blood or body fluids. Such waste materials have the potential of transmitting infectious and contagious diseases to health care and sanitation staff working in a hospital, patients and their caretakers or attendants, and other visitors.

Sources of biomedical waste

The main sources of biomedical waste are hospitals (including veterinary hospitals), clinics, nursing homes, dispensaries, morgues or funeral homes, pathological laboratories, medical transporters, etc. The sources of biomedical waste may be classified into major and minor, depending on the amount of waste generated. Major sources include hospitals, nursing homes, dispensaries, etc. Minor sources include physician and dental clinics, support services, etc.

Hospitals

They are a major source of biomedical waste. Departments in a hospital like surgery, gynaecology and obstetrics, paediatrics, oncology, orthopaedics, ophthalmology, ENT (ear, nose and throat), physical medicine and rehabilitation, emergency, burns and trauma, neurosurgery, etc., generate a specific type of biomedical waste.

Clinics

All type of clinics, immunisation and dialysis centres also generate biomedical waste. However, the amount and type of waste generated by these is not as much as that by hospitals, public health centres and dispensaries.

Support services

These are a minor source of biomedical waste. Support services include blood bank, pharmacy, mortuary, laundry and laboratories.

Categories of biomedical waste

The categories of biomedical waste according to the Biomedical Waste (Management and Handling) Rules, 2016, are illustrated in Table 4.1.

Table 4.1: Biomedical waste categories as per the Biomedical Waste (Management and Handling) Rules, 2016

Waste category	Colour code	Description
1	Yellow	Human anatomical waste
2	Yellow	Animal waste (carcass, organs, tissues, bleeding parts, fluid or blood discharge from hospitals, etc.)
3	Yellow	Microbiology and biotechnology waste (generated from laboratory culture, stocks or specimens of microorganisms, human and animal cell cultures used in research and industrial laboratories, production of biological toxins, and dishes and devices used for transferring cultures)
4	Blue or white	Waste sharps (blades, needles, syringes, scalpels, glass pieces, etc., that are capable of causing punctures and cuts)
5	Black	Discarded medicines and cytotoxic drugs comprising outdated and contaminated medicines
6	Red	Soiled waste items like cotton, bandages, dressing, plaster casts, linen and beddings, and other material stained with blood or body fluids
7	Blue	Solid and dry waste (generated from disposable items other than waste sharps like tubings, catheters, intravenous sets, etc.)
8	Yellow	Liquid or wet waste (generated from laboratory, or from washing, cleaning, housekeeping and disinfection activities)
9	Black	Incineration ash obtained after burning of biomedical waste
10	Yellow	Chemical waste (containing chemical substances like laboratory reagents, film developers, expired disinfectants and solvents)

Fig. 4.1: General waste generated in a hospital

Classification of biomedical waste

The World Health Organization (WHO) has classified hospital or biomedical waste into the following categories.

General waste

It consists of waste generated from office and administrative areas, kitchen, laundry and store.

Sharps

These include hypodermic needles, needles attached to tubings, scalpel blades, razors, nails, broken glass pieces, etc.

Infected waste

It includes equipment and instruments used for carrying out diagnostic and therapeutic procedures, waste tissues after a surgical procedure, organs, foetuses and autopsy waste, to name a few.

Chemical waste

Formaldehyde is a major source of chemical waste in hospitals. It is used to clean and disinfect surgical tools and equipment, preserve specimens and disinfect liquid infectious waste. It is also used to preserve tissues and organs, and in the radiology department. Solvents like xylene, acetone, ethanol and methanol are some common chemicals used in laboratories. Waste containing substances having genotoxic properties, e.g., cytostatic drugs (often used in cancer treatment) come under chemical waste.

Radioactive waste

Such waste materials are generated while carrying out medical research in laboratories and in the nuclear medicine department.

Cytotoxic drugs

These are medicines that contain chemicals toxic to cells, thus, preventing their replication or growth. These are used to treat cancer.

Handling biomedical waste — people at risk

Unattended and untreated biomedical waste in a hospital may cause serious infections and diseases to medical and paramedical staff working there, patients and their attendants, and other visitors to the facility.

The sanitation staff working in a hospital are responsible for the collection, segregation, storage and

transportation of biomedical waste. As these workers are in constant and direct contact with sharps like needles, blades, etc., they are at a risk of contracting serious infections like HIV/AIDS, Hepatitis B and C, etc.

The hospital authorities must, therefore, conduct training programmes for the sanitation staff working there and provide them with Personnel Protective Equipment like apron, mask, gloves, gumboots, goggles, etc.

Rag pickers, and municipal and private sanitation workers also collect hospital waste. Rag pickers are often seen segregating plastic materials, and used syringes and needles from heaps of waste. Therefore, they, too, are at a risk of contracting serious infections like HIV/AIDS, Hepatitis B and C, etc.

Practical Exercise

Activity

Visit a nearby hospital and find out the departments generating the following types of biomedical waste.

Material required: PPE kit, sanitiser and writing material

Type of waste	Department generating such waste
Needles	
Human organs and tissues	
Gloves and plastic materials	
Stained dressing and bandages	

Check Your Progress

A. Multiple Choice Questions

1. Biomedical waste must be disposed appropriately as they _____.
   (a) are infectious in nature
   (b) may pose health hazards
   (c) have radioactive properties
   (d) All of the above

2. _____ waste includes equipment and instruments used for carrying out diagnostic and therapeutic procedures.
   (a) Infected
   (b) Chemical
   (c) Cytoxic
   (d) None of the above
3. The World Health Organization has classified biomedical waste into general, infected, radioactive and _____ categories.
   (a) sharps
   (b) cytotoxic
   (c) chemical
   (d) All of the above
4. The colour code for human anatomical waste is _____.
   (a) blue
   (b) yellow
   (c) black
   (d) red

B. Short Answer Questions

1. Write a short note on biomedical waste.
2. Discuss the sources of biomedical waste.
3. Classify biomedical waste, according to the World Health Organization. Write a note on any two types of biomedical waste.

SESSION 2: SEGREGATION, TRANSPORTATION AND DISPOSAL OF BIOMEDICAL WASTE

This Session focuses on the segregation, packaging, storage, transportation and disposal of biomedical waste. It also gives insight to the colour coding criteria, as recommended by the World Health Organization (WHO), for the storage and disposal of different types of biomedical waste.

Points to remember

The following points must be taken care of while segregating, packaging, storing and transporting biomedical waste with reference to a hospital or health care facility.

- Such waste must not be mixed with general waste, i.e., it must be kept separately.

Fig. 4.2: Coloured bins for disposing different types of biomedical waste in a hospital

- Biomedical waste must be segregated at the point of waste generation (i.e., wards) and put in labeled containers before being transported for treatment and disposal.
- Untreated biomedical waste must be transported only in a government vehicle as authorised by a competent authority.
- Untreated waste must not be stored in a hospital for more than 48 hours. If necessary (for medico-legal cases, or for obtaining second medical opinion, etc.), then permission must be sought by the authorities concerned.

Colour code and containers for biomedical waste disposal

The colour and type of containers, in which different classes of biomedical waste may be disposed, as per the guidelines of the Ministry of Environment and Forests (MoEF), Government of India, are as follows.

Table 4.2: Colour code and containers for biomedical waste disposal according to MoEF guidelines

Waste category	Waste class	Container	Colour code
1	Human anatomical waste	Plastic bag	Yellow
2	Animal waste	Plastic bag	Yellow
3	Microbiological and biotechnological waste	Plastic bag or disinfected container	Yellow, red
4	Sharps	Plastic bag	Blue, white (translucent)
5	Discarded medicines and cytotoxic drugs	Plastic bag	Black
6	Soiled waste	Disinfected container or plastic bag	Yellow, red
7	Solid waste	Disinfected containers, plastic bag or puncture proof containers	Red, blue and white
8	Liquid waste	Not Applicable	Not Applicable
9	Incineration ash	Plastic bag	Black
10	Chemical waste	Plastic bag	Black

Table 4.3: Colour code for biomedical waste for developing countries as recommended by the WHO

S. No.	Type of waste	Colour code
1.	General non-hazardous waste	Black
2.	Sharps (infected and non-infected)	Yellow and blue
3.	Infected plastic waste (not containing sharps)	Yellow and red
4.	Chemical and pharmaceutical waste (other than cytotoxic drugs, radioactive waste and high pressure containers)	Red
5.	Clinical waste that requires autoclaving	Blue

Transportation of biomedical waste

There are two methods of biomedical waste transportation — internal and external.

Internal transportation

The hospital sanitation and housekeeping staff dump polythene bags of different colours in garbage bins. Only push carts and garbage trolleys, especially designed for the purpose, are used for transporting biomedical waste in the hospital premises. The waste is routed through the main ramp to the ground floor, and then, to the incinerator site. General waste (in black polythene bags) is unloaded at municipal dumps, adjacent to the incinerator site. In case of leakage or spillage from trolleys or polythene bags, a sanitary inspector is informed. The person ensures immediate cleaning and disinfection of the affected area or trolley(s).

Fig. 4.3: A trolley for transporting biomedical waste

External transportation

It is used for transporting biomedical and general waste generated in the hospital outside its premises. Different types of biomedical waste are packed in different coloured plastic bags for disposal. General waste is packed in black bags. On the request of hospital authorities, the civic body of the conerned city, district, town or village sends a vehicle to collect and transport general waste.

Fig. 4.4: A vehicle for transporting biomedical waste

Methods of biomedical waste disposal

Incineration

It is a thermal process that converts biomedical waste to inorganic incombustible matter, leading to significant reduction in the waste volume and weight. A medical waste incinerator eliminates pathogens from waste, reducing it to ash. Waste material meant for incineration are packed in yellow bags and carried to the incinerator unit for disposal.

Autoclaving

Autoclaves are closed units that apply heat, pressure and steam to medical equipment for a certain period in order to sterilise them for re-use. Autoclaving is also used for disinfecting biomedical waste. Wastes meant for autoclaving are collected in blue bags. Autoclaves kill or eliminate microorganisms present in the waste before it is dumped at a landfill site.

Shredding

It is one of the methods for the treatment of biomedical waste materials like syringes, scalpels, glass vials, blades, plastics, catheters, broken ampoules, intravenous sets or bottles, blood bags, gloves, bandages, etc., before they are declared safe for disposal. A shredding machine is used to shred such materials into smaller pieces, destroying them in the process. It helps prevent re-use of non-infectious biomedical waste material. It also acts as an identifier that the waste is safe for disposal.

Disposal of different types of biomedical waste

Hospitals and clinics seldom mix biomedical and general waste, which exposes sanitation workers to serious health risks. This is an inappropriate and unsafe practice. Biomedical waste must be treated and disposed as per the standards of the Biomedical Waste (Management and Handling) Rules, 2016. Bags containing such materials must always be labelled appropriately.

Fig. 4.5: Coloured bags for collecting different types of biomedical waste

General waste

About 80–85 per cent waste generated in hospitals falls under this category. Such waste is like domestic waste, and hence, non-hazardous in nature. General waste consists of fruit and vegetable peels, papers, tea or coffee sachets, food articles, polythene and paper bags, etc. Such waste is packed in black polythene bags and disposed in municipal dumps, which are, further, disposed appropriately by the municipal corporation.

Radioactive waste

Such type of waste is generated in radiological and imaging processes in the radiotherapy or radiology department. Solid waste items like syringes, absorbent papers and clothing are stored in an appropriately labeled drum or container and allowed to decay. Liquid radioactive waste is diluted and drained in sewers. Gaseous waste is diluted and dispersed in the atmosphere.

Liquid and chemical waste

Such waste is disinfected by exposing it to 1 per cent Sodium hypochlorite solution. After this, it is discarded into drains or sewers.

Sharps

These consist of items like needles, scalpels, blades, knives, syringes, etc., that are used to carry out medical procedures. These can cause cuts and skin punctures. Besides, if sharps happen to be contaminated, harmful pathogens may get transfered to the handler's body

by way of injuries caused by them, which may lead to serious infections and diseases. Therefore, it is essential to handle sharps cautiously and dispose them appropriately. Some of the guidelines for the safe handling and disposal of sharps are as follows.

- One must always wear Personal Protective Equipment like gloves while handling sharps. Though gloves cannot prevent injuries, these definitely help ensure a clean work practice.
- All sharps must be disposed immediately after use in a sharps container.
- The container must be puncture resistant, rust resistant and waterproof. A label like 'CAUTION — WASTE SHARPS' must be stuck on it, which must be legible from a distance.
- The container must be placed in an area with a limited footfall so that only health care workers have access to it.
- The sharps container must never be overfilled as spillovers may lead to injuries or accidents.
- After collection, the sharps may accordingly be segregated before being transported to a waste treatment site, where they are shredded mechanically and incinerated.
- There should be least distraction at the workplace, for example, people not needed must not be allowed in the area.
- Responsibilities among workers, who are supposed to handle such waste material, must be clearly demarcated.
- Only skilled workers must be allowed to handle sharps as lack of practice and expertise may lead to cuts, punctures and injuries, which may further lead to infections and diseases. New staff must be allowed to work only under constant and direct supervision of a trained worker.
- A container like tray must be used to transfer sharp instruments from one worker to another while working. Use of a container helps prevent direct contact, and hence, skin punctures, cuts and injuries.
- Do not re-cap needles without a built-in safety mechanism. However, at times like in dental

Tending to injuries caused by sharps

- An injury caused by a sharp instrument must be immediately reported to the shift in-charge or supervisor.
- The injured area must be allowed to bleed. It must, then, be washed thoroughly under running water to prevent the entry of pathogens in the body. After washing the area, an antibiotic ointment must be applied over it and it must be dressed appropriately.

procedures, re-capping is often required. In such cases, the needle must be re-capped appropriately and cautiously.

- Used needles must be shredded mechanically and disposed appropriately.
- After using a syringe, the needle must not be separated from it or broken. The needle and the syringe are potentially contaminated by blood and infected body fluids. So, they must be disposed together as a single unit.
- Sharps containers are used several times a day. So, they need to be appropriately cleaned and disinfected regularly.

Table 4.4: Treatment and disposal of biomedical waste as per the Biomedical Waste Management and Handling Rules, 2016

Category of waste	Waste class or type	Treatment and disposal
1	Human anatomy waste (human organs and tissues)	Incineration and deep burial
2	Animal waste (animal tissues, organs, carcass, bleeding body parts, body fluids, discharge from hospitals, etc.)	Incineration and deep burial
3	Microbiology and biotechnology waste (generated from laboratory, culture, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell culture used in research and industrial laboratories, etc.)	Autoclaving and incineration
4	Waste sharps (needles, syringes, scalpels, blades, glass pieces, etc.)	Disinfection (chemical treatment), autoclaving, shredding
5	Discarded medicines and cytotoxic drugs (wastes comprising expired and contaminated medicines)	Incineration, destruction and disposal in secured landfill sites
6	Soiled waste (cotton, bandages, dressing, plaster casts, linen and beddings, etc., contaminated with blood or body fluids)	Incineration and autoclaving
7	Solid waste (generated from items other than waste sharps like tubings, catheters, intravenous sets, etc.)	Disinfection by chemical treatment, autoclaving and shredding
8.	Liquid waste (generated from laboratory, and activities like washing, cleaning, housekeeping and disinfecting)	Disinfection by chemical treatment and discharging into drains
9.	Incineration ash	Disposed in municipal landfill sites

Practical Exercise

Activity

Visit a nearby hospital and seek permission from the sanitation staff supervisor to see the segregation of different types of biomedical waste. Do not forget to wear Personal Protective Equipment while doing this activity. Identify the types of biomedical waste generated in the hospital and fill in the following table.

Material required: PPE kit, sanitiser and writing material

Type of biomedical waste	Class of waste	Type of container	Waste category number	Colour code

Check Your Progress

A. Multiple Choice Questions

1. The colour code for clinical waste that requires autoclaving is _____ bag.
   (a) black
   (b) blue
   (c) yellow
   (d) red
2. Biomedical waste may be transported by _____ and _____ means.
   (a) internal
   (b) external
   (c) None of the above
   (d) Both (a) and (b)
3. Biomedical waste must not be mixed with _____ waste.
   (a) general
   (b) radioactive
   (c) chemical
   (d) cytotoxic
4. About _____ per cent waste generated in hospitals fall under the general category.
   (a) 70–78
   (b) 5–10
   (c) 80–85
   (d) 35–45

B. Short Answer Questions

1. Write a note (in 150–200 words) on the treatment and disposal of biomedical waste.
2. What do you understand by general waste? How is it disposed?
3. Write the colour code for the following types of waste.
   (a) General non-hazardous waste
   (b) Sharps
   (c) Chemical
   (d) Anatomical waste
4. What are sharps? Give three examples.
5. State two safety guidelines that one must follow while handling sharps.

SESSION 3: ROLE OF THE HOSPITAL STAFF IN BIOMEDICAL WASTE MANAGEMENT

It is the paramount responsibility of the hospital management to keep people (medical and paramedical staff; patients, their attendants or caretakers and relatives) visiting the facility safe from infectious diseases, which may be caused by unattended and untreated biomedical waste materials. Therefore, the sanitation staff, working in a hospital, are responsible for the collection, segregation and management of hospital waste.

This Session underlines the role of various hospital staff in biomedical waste management. Besides, it discusses the importance of providing training to the concerned staff in biomedical waste management.

Medical superintendent

The official is responsible for overseeing the implementation of waste management directives in a hospital so that the waste generated at the facility is disposed of timely and appropriately. The medical superintendent is also required to submit an annual report regarding the disposal of biomedical waste to the authorities concerned and keep them updated about the regular waste management programmes being carried out in the hospital.

Duty of hospital staff in waste segregation

One staff member from each medical and support service department of the hospital supervises the segregation of biomedical waste. Ward nurses, assisted by GDAs, supervise the work in their respective wards. In operation theatres, there is one in-charge, who is responsible for the segregation of the waste generated.

Waste management committee

This committee performs the following functions.

- Circulates copies of rules and guidelines about biomedical waste management among different departments
- Conducts awareness programmes for the hospital staff on the importance of biomedical waste management
- Conducts training programmes for medical and paramedical staff, including GDAs, on biomedical waste management practices

Heads or in-charge of labs, units or departments

They are responsible for formulating waste management norms and ensuring their implementation in their respective departments, which must be done in conformity with the general guidelines as issued by the hospital administration. They are also responsible for getting all staff — doctors, nurses, paramedics and group D employees — trained in biomedical waste management, and coordinate with the biomedical waste management officer in-charge from time-to-time for administrative support.

Waste management officer in-charge

The official is a member of the hospital's waste management committee. The waste management officer in-charge coordinates with the heads of various departments, infection control officer and matron, and monitors the hospital's waste management activity from time-to-time at various levels, i.e., generation, segregation, collection, storage, treatment, transportation and disposal. The person is responsible for the circulation of all policy decisions and the hospital's waste management manual among the concerned staff.

Matron or nursing superintendent

The matron designates a senior administrative level deputy as ward or sister in-charge for supervising and ensuring the implementation of the hospital waste

management guidelines. The person is responsible for monitoring the waste management activities being carried out in the hospital. The official is responsible for ensuring the training of nursing staff, medical assistants and sanitary staff, including sweepers, in waste management procedures and basic personal hygiene.

The ward or sister in-charge conducts surprise checks, reviews and evaluates various aspects of scientific hospital waste management at all levels — from generation to disposal. The person also attends meetings conducted by the hospital waste management committee on behalf of the matron and coordinates with the hospital administration on the training of nurses in biomedical waste management.

In-charge sanitation inspector

The officer is responsible for the implementation, monitoring and evaluation of the hospital waste management programme — from collection, segregation and storage of waste to its disposal. The officer attends the hospital waste management committee meetings and ensures training of the concerned staff members in biomedical waste management practices. Besides, the in-charge sanitation inspector provides feedback to the concerned authorities in case of accidents and spills.

Training in hospital waste management

It is important to provide training to all categories of hospital staff, i.e., resident doctors, nurses, paramedical staff, GDAs, attendants, canteen staff, etc., in biomedical waste management in order to ensure its effective implementation. The training must be imparted by way of demonstration. Besides, it needs to be interactive. The training session must include the following.

- Knowledge on different types of waste and hazards that each of them may cause
- Waste minimisation (reduction in the use of disposables)
- Segregation policy
- Safe handling of sharps

- Use of Personal Protective Equipment
- Colour coding of containers
- Appropriate treatment of different types of waste
- Management of spills
- Occupational health and safety measures that need to be followed
- Needlestick injury

Practical Exercise

Activity

Visit a nearby hospital and observe the duties being performed by both medical and paramedical staff in biomedical waste management. Prepare a note based on your observations and share it with the class.

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Fill in the Blanks

1. A _____ is responsible for overseeing the implementation of waste management directives in a hospital.
2. A _____ liaises with the heads of various departments and matron.
3. The _____ committee ensures the biomedical waste management of a hospital.
4. The _____ is responsible for the implementation, monitoring and evaluation of hospital waste management programmes.

B. Short Answer Questions

1. State any two functions performed by the hospital waste management committee.
2. State any two duties of the medical superintendent as regards to biomedical waste management.

Unit 5

Medical Record Keeping

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A medical record is a written legal document that provides information about all pertinent interactions with a patient, i.e., assessing, diagnosing, planning, implementing and evaluating. The document is retrievable for future purposes. Technology is extensively used in the drafting of medical records. The records are protected under the patient's Right to Privacy, and hence, treated as 'confidential'.

This Unit describes the process of preparing medical records, content of medical documentation and the importance of maintaining the document.

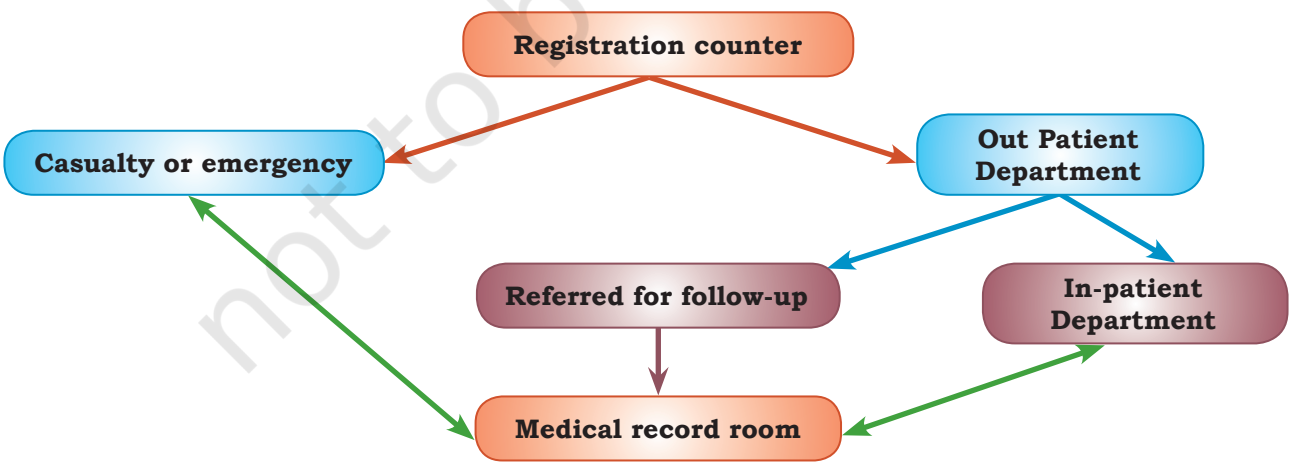

Fig. 5.1: Process of Medical Record keeping

Session 1: Importance of Maintaining Medical Records

This Session gives insight to the importance of maintaining medical records. Being permanent in nature, a medical record helps a medical practitioner diagnose a patient's health problems, and recommend appropriate and timely treatment, and care. It also testifies the patient's medical history. It furnishes vital information needed to evaluate the health care services being rendered to the person. A GDA needs to ensure the execution of diagnostic and therapeutic orders entered in the patient's medical record.

Purposes of medical record keeping

Medical records help facilitate teamwork and research to ensure efficient and continuous patient care. Maintenance of medical records serves many purposes, such as effective communication among health care professionals, recording of diagnostic and therapeutic orders, planning of care, reviewing the quality of care being provided, research activities being planned or carried out, etc.

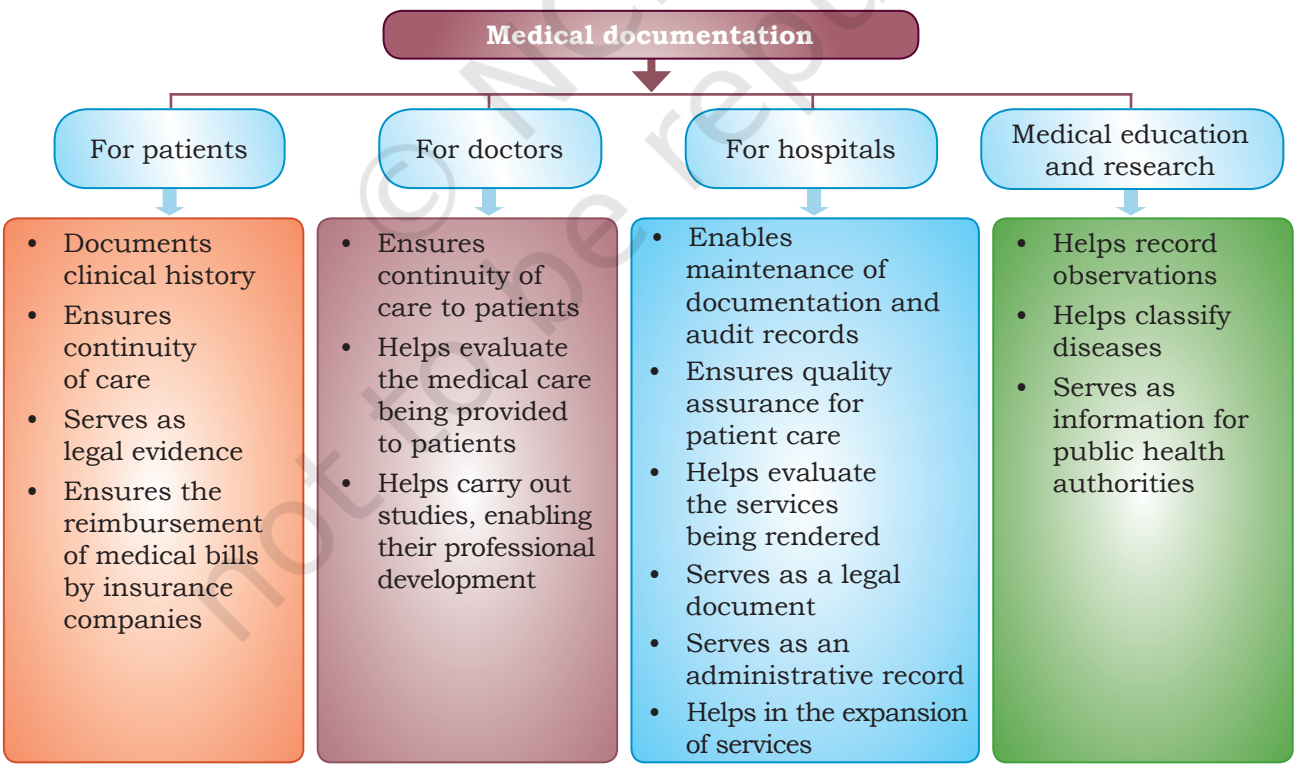

Fig. 5.2: Purposes of maintaining medical records

For providing continuity of care

A medical record ensures continuity of care to a patient throughout one's stay in the hospital. Doctors, nurses, ward staff and GDAs, who interact with the patient at different times of the day and in different ways, get a clearer picture of what took place in their absence. So, it is important that all health care staff maintain a written record of anything they perform or observe in the patient in order to ensure coordination and continuity of care being rendered. The record, thus, helps health care workers assess and understand the patient's medical history, current health status (the patient's health condition and response to illness) and the further course of treatment required.

Evidence of the quality of care provided

Medical records are legal and, thus, treated as significant evidence in regulatory and administrative matters. Documentation helps maintain patient audit records, improving the quality of care being provided to patients. Maintaining patient audit records serves two purposes — quality assurance and reimbursement. As part of the quality assurance programme, health care agencies periodically conduct chart audits to determine if the care being provided to the patients meets the established standards of patient care. Results of the audit may lead to changes in the way care is being rendered. If deficiencies are observed, training may be provided to the concerned staff.

Record for reimbursement

Documentation helps the patient claim reimbursement of one's medical bills from insurance companies, who do the needful after reviewing the patient's medical record.

Medico-legal document

The record is a legal document, which is a proof of the patient's health condition and the medical care received. It may be used as evidence in court proceedings and, therefore, is an important document that helps in implicating or absolving health practitioners charged with negligence.

NOTES

Resource for research

A medical research is carried out only after studying a patient's medical records. It is only after a thorough study of the medical records that researchers or medical practitioners understand the nature of the patient's ailment and decide on the course of treatment. Apart from helping improve patient care, researches increase the professional knowledge of medical practitioners.

Practical Exercise

Activity

Visit a nearby hospital and interact with a GDA or staff nurse on how patient medical records are maintained. Find out the key areas one must take a note of while documenting a medical record. Prepare a write-up based on your interaction and observations, and share it with the class.

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Fill in the Blanks

1. A _____ is a written, legal document of all pertinent interactions with a patient related to the assessment, diagnosis, planning, implementation and evaluation of medical care provided.
2. A medical record ensures _____ and _____ of care being provided to a patient.
3. A medical record serves as a/an _____ in court.
4. A _____ is carried out only after studying a patient's medical records

B. Short Answer Questions

1. Write a short note on medical records.
2. List any three purposes of medical documentation.

SESSION 2: PROCESS OF MEDICAL RECORD KEEPING

Medical records are a set of documents maintained in a chronological order so that these may be easily retrieved as and when required. The staff working in the 'medical records section' must ensure that the files are easily accessible to the authorities concerned.

The record keeping procedure must, thus, be quick and accurate. This Session describes the process of record keeping, and type of entries and notes to be prepared while maintaining medical records.

Medical records section

This section or department is divided into admission and information enquiry, and central record office.

Admission and information enquiry office

This office initiates the process of record keeping, maintains a record of patient admission and discharge, and follows the protocol as laid down by the hospital management. The office works round-the-clock to provide information and assistance regarding the availability of beds and doctors, etc., to patients and their relatives, or about the health status of patients to their relatives and caretakers.

Central record office

This office maintains a record of discharged patients, performs the coding and indexing of files of each patient as per the date. A patient's file contains a detail of the person's ailment, i.e., diagnosis, and treatment and care provided. It also performs procedures as regards to the issuance of reports and certificates to patients for insurance purposes.

Filling in a patient's medical record

A General Duty Assistant (GDA) may, sometimes, be required to work in the medical records section. Hence, the person must be trained in the maintenance, storage, retrieval and processing of records, which may be required for police or legal purposes. The following points need to be taken into account while filling in a patient medical record.

- Patient admission form
- Case sheet, mentioning the person's medical history, clinical findings, investigations carried out, treatments administered and progress reports

- Consent form from relatives for carrying out certain procedures on a patient
- Lab reports and X-ray films arranged in sequence on discharge

Content of documentation

On admission to a facility, the patient's complete health history is obtained and documented. This is followed by the current need for assessment. These may be combined or maintained on separate forms. All significant findings must be documented either in narrative notes or on flow sheets (data maintained in graphic or tabular form).

Type of entries

Different type of entries and notes are recorded in a hospital. They are as follows.

Admission note

An admission note acknowledges the arrival of a new patient in a hospital. It is a part of medical record that documents the patient's present condition, reasons for admission and initial instructions for patient care. The admission note, usually, includes the patient's identifying information, chief medical complaint, diagnosis and treatment administered, allergies or reactions (if any), vital signs and physician's notes.

Sample of Admission Note

Patient Identifying Information

Name: _____ Age: _____ Sex: _____ ID No.: _____

Address_____

_____

Chart No.: _____ Room No.: _____

Attending physician: _____ Admission date: _____

Date: _____

Time: _____

Service: _____

OP/IP Department: _____

Chief or present complaints

History of present illness: is a detailed description of the chief complaint, emergency action(s) taken and patient response(s), if relevant.

Past medical or surgical history: describes recurrent medical problems (chronic problems like diabetes mellitus, hypertension, etc.), surgical history and a record of medication and treatment administered.

Family history: describes the health history of parents, siblings, children and spouse.

Social history: presents an account of the social and occupational background of the patient.

Physical examination: is conducted by a physician to record various symptoms of a disease.

Review of systems: comprises review of anatomical systems like general — head, eyes, ears, nose and sinuses, and throat, mouth and neck; cardiovascular, respiratory, gastrointestinal, urinary, genital, musculoskeletal, nervous, psychiatric, hematologic and endocrine.

Investigations: relates to lab or diagnostic procedures.

Assessment and plan: include discussion on differential diagnosis, supporting history and test findings. During each shift, documentation of patient assessment is done. The 'change of shift report' refers to communication between the nursing staff during shift changeover periods regarding patient care. At the end of each shift, the nurse-on-duty documents information about the condition of the patient.

Assessment note: refers to documentation done to record the overall assessment of a patient's state, i.e., physical, emotional and behavioural.

Transfer and discharge note: is prepared when a patient is transferred to another facility either temporarily or permanently.

Symptoms and case history

All symptoms observed in a patient need to be carefully documented in detail by the concerned hospital staff or department. A record of complaints made by the patient must also be maintained. Such documentation includes both subjective and objective data, in terms of location, duration, intensity, amount, size and frequency. As regards to a patient's complaints, a record about the care and treatment rendered, and the patient's responses to these is also documented.

Medication and treatment note

A medication administration record is maintained for all patients by the concerned hospital staff or department. When the recommended medicines are administered

to a patient, charting is done. In case a medicine is not administered, then the reason for that must also be documented and the concerned physician must be informed. The time of medication, route and dosage of medicine(s) administration, reason for medicine(s) administration, the patient's response to it and side-effects (if any) are also documented.

Observation note

It refers to the hourly documentation and recording of all patient vitals, i.e., pulse rate, blood pressure and temperature; and also the person's emotional and behavioural state. The patient's sensorial, as regards to the level of consciousness and orientation to time, place and person, is also documented. In case the patient is Leaving Against Medical Advice (LAMA), it must be documented clearly.

Transfer and discharge note

Such a note is written when a patient is transferred to another facility either temporarily or permanently. A similar note is prepared when the patient is sent for a test within the same facility. The note includes the following.

- Reason for transfer
- Method of transportation
- Person giving and receiving the report
- Documentation of the patient's vital signs and the treatment(s) administered

Practical Exercise

Activity

Take an appointment from the supervisor of the medical record section or department at a nearby hospital. Visit the hospital and talk to the official about how medical record for each patient is documented and the type of medical records maintained by the department. Prepare a write-up based on your interaction and present it before the class.

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Fill in the Blanks

1. The admission note includes patient identifying information and _____.
2. Family history includes the _____ history of parents, siblings, children and spouse.
3. The _____ refers to communication between the nursing staff during shift changeover periods.
4. The full form of LAMA is _____.

B. Short Answer Questions

1. Why is it important to maintain medical records?
2. List the contents of admission note.
3. Describe the purpose of transfer and discharge note.

SESSION 3: MAINTENANCE OF MEDICAL RECORDS

This Session describes different methods of medical documentation and their formats. It also discusses the different types of medical record maintained at a hospital and the role of a GDA in the compilation and maintenance of such records.

Source oriented medical records

Such records are maintained according to health disciplines, for example, medicine, nursing, laboratory, X-ray, etc. These records are narrative in nature. The document incorporates information about the care and treatment rendered to a patient, and one's responses to that during one's stay in the hospital. These are documented chronologically or in sequence. There is a space earmarked in the record form for the concerned medical practitioner to make an entry.

Maintaining such records and their retrieval is easy. In order to maintain such a record, the concerned staff member just needs to record the origin and date of the report.

Such records may also be referred to as progress notes written by nurses attending to a patient. However, the main disadvantage is that it is difficult to follow only a particular course of treatment for the patient.

Problem oriented medical records

Such a record is indexed and saved on the basis of problems. The record is itemised and the problems are organised under various categories. The main advantage is that the record makes it easier to follow a course of treatment under a specific problem. The record consists of four components — database, problem list, initial plan for each problem and progress note for each problem. However, maintaining such a record is a time-consuming exercise.

Types of record

- Out patient record
- In patient record
- Doctor's order sheet — doctor's orders regarding medication, investigations, diet, etc., written on separate sheets
- Graphic charts [denoting temperature, pulse and respiration (TPR) rate, are recorded every hour to detect deviation]
- Laboratory examination reports
- Diet sheets or charts
- Consent form for operation and anesthesia
- Intake and output chart of a patient on intravenous fluids or blood transfusions, etc., or on a liquid diet
- Reports of anesthesia and other supportive therapies
- Register of births and deaths, operations, admission and discharge, OPD attendants, etc.

Documentation format

Narrative charting

It is a free style method of documentation. It provides information in the form of statements, describing events surrounding patient care. Narrative charting format may be structured and problem focused.

Problem focused charting

The process begins with admission assessment, which is, usually, completed on a separate form, and initiation of a problem list based on initial assessment. Documentation of patient care is focused on intervention and evaluation related to the problems

listed. Each entry in the progress note is preceded by date, time and problem(s) listed. Problem focused charting includes the following.

A — Assessment
P — Problem identification
I — Intervention
E — Evaluation

Maintenance of records — points to note

- The records are maintained by a GDA in each ward or department.
- The records are kept at a place that is not accessible to patients and visitors.
- Confidentiality of records must always be maintained.
- A patient's medical record must not be shared with the police or other agencies without the written permission of the hospital administration as it is a confidential document.
- Each hospital has its own way of customising and maintaining medical records.

Documentation for medico-legal cases

A medico-legal case (MLC) refers to a case of accident or injury, in which investigation by law enforcing agencies like police is important to fix the responsibility regarding the causation of the incident. The important documents to be maintained by the hospital in MLCs are as follows.

Police intimation report

The hospital must submit this to the nearest police station at the earliest after the arrival of a patient.

Medico-legal register

This is issued by a medical officer, attending to the patient, and is submitted on request made by the police.

Discharge certificate

This is given in case of MLCs only on the demand of the police.

Accident-cum-MLC register

This register is, usually, maintained by the casualty medical officer.

Medication record

It is a record, which contains details of medicines administered to the patient, date, time, route of dosage and frequency. The GDA on duty must sign on it.

Nursing discharge or referral summaries

This is made at the time of discharge or transfer of a patient to another health care facility.

Role of a GDA in record keeping

The GDA is also responsible for the compilation and maintenance of medical records, which include information about patient care on the following aspects.

- Sponging
- Oral and denture care
- Foot care
- Hair and nail care
- Urinary catheter care
- Back care
- Turning and positioning
- Meal and fluid intake
- Physical activities like walking
- Range of motion exercises, if done
- Height
- Weight
- Input–output chart
- Temperature
- Pulse rate
- Respiration rate
- Blood pressure
- Blood glucose
- 24–hour urine output

Practical Exercise

Activity

Visit a ward in a nearby hospital and talk to the ward supervisor about the process of dispatching the medical record of a patient to the medical records section. Prepare a note based on your interaction and share it with the class.

Material required: PPE kit, sanitiser and writing material

Check Your Progress

A. Fill in the Blanks

1. A _____ is maintained according to health disciplines like medicine, nursing, surgery, etc.
2. The doctor's order regarding medication, investigation, diet, etc., is to be written on a separate sheet called the _____.
3. The major role of a GDA is to compile, process and maintain _____, which include information about patient care.
4. A _____ is made at the time of discharge or transfer of a patient to another health care facility.

B. Short Answer Questions

1. Discuss the different formats of documentation.
2. What do you understand by medico-legal cases? What are the documents maintained by a hospital in such a case?
3. Write a note on problem oriented medical records.

NOTES

Appendix

Common medical terminology — abbreviations and their meanings

Abbreviation	Meaning	Abbreviation	Meaning
a.c.	Before meals	MEq	Milliequivalent
ad lib	Freely	Min	Minute
a.m.	Morning	Mg	Milligram
ASA	Aspirin	ML	Millilitre
b.i.d	Twice a day	NPO	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 centimetre	Q	Every
disc or D.C.	Discontinue	Qh	Every hour
disp.	Dispense	Qid	Four times a day
elix.	Elixir	SoB	Shortness of Breath
Ext	Extract	Sol	Solution
fl or fld	Fluid	ss.	One half
g. or Gm. or g	Gram	Stat	Immediately
Gr	Grain	susp.	Suspension

Glossary

Acid: *is a substance that changes a blue litmus paper to red, reacts with metals and bases to liberate hydrogen and form salts, respectively, and promotes chemical reactions.*

Alkali: *is a strong base that turns a red litmus paper to blue. It reacts with an acid to produce natural salts. In concentrated form, it is corrosive to organic tissues.*

Ambulation: *is the ability to walk without assistance.*

Arthropods: *are invertebrate animals, having an exoskeleton, a segmented body and paired joint appendages, for example, mosquitoes, flies, fleas, ticks, etc.*

Aseptic technique: *is a collection of medical practices and procedures that helps protect patients from harmful germs and microorganisms.*

Attenuated vaccine: *is made by reducing the virulence of a pathogen but keeping it viable. Attenuation alters the effect of an infectious agent so that it becomes harmless or less virulent.*

Chemoprophylaxis: *refers to the administration of a medicine to a person to prevent the occurence of a disease or an infection. For example, antibiotics may be administered to prevent bacterial infections. The medicines may be given before or after treatment.*

Contraindication: *is a condition, in which a drug, procedure or surgery should be avoided as it may be harmful to a patient.*

Denaturation: *refers to breakdown of bacterial protein.*

DPT vaccine: *is a class of combination vaccines against three infectious diseases — diphtheria, pertussis and tetanus — in humans.*

Distilled water: *refers to purified water, where both contaminants and minerals are removed. Distillation means boiling the water till it reaches gaseous state, cooling it and collecting the droplets of the gas formed. It is done to remove impurities and minerals present in water.*

Elixir: *is a sweet hydro alcohol based medicine, which is taken orally on doctor's advice to cure an illness.*

Endemic: *(of a disease or condition) is regularly found among a particular group of people and is difficult to get rid of.*

Floor wax: *helps seal porous wood surface, protects it from stains, hides scratches and dents, and increases shine.*

Fomite: *also called 'fomes', it is an inanimate object capable of carrying infectious organisms.*

Hypodermic needle: *composed of three words — hypo (under), dermic (skin) and needle, it is a hollow needle used with a syringe to inject substances into a person to collect body samples.*

Hyposthenia: *is characterised by a weakened medical condition or lack of strength.*

ICDS: *is the acronym for Integrated Child Development Services.*

Incident Action Plan: *is an oral or written plan, reflecting the overall strategy for managing an incident.*

Ingestion: *is the process, wherein, food enters the digestive system through the mouth.*

Microbial cultures: *are multiplying microbial organisms that are allowed to reproduce in predetermined culture medium under controlled laboratory conditions.*

MMR vaccine: *is a class of combination vaccines against three infectious diseases — measles, mumps and rubella — in humans.*

Morbidity: *is the condition of suffering from a disease or a medical condition.*

Needlestick surgery: *refers to the penetration of a needle or sharp, in contact with various body fluids, into the skin.*

Pathogenesis: *is derived from Greek words 'pathos', meaning 'disease', and 'genesis', meaning 'creation'. It is the process by which a disease or disorder develops. It can include factors that contribute not only to the onset of a disease or disorder, but also to its progression.*

Parenteral therapy: *is a medicine or solution administered in a person via a route other than ingestion.*

Pasteurisation: *is the partial sterilisation of a product like milk to make it safe for consumption and improve its storage quality.*

Pre-pathogenesis phase: *is the period preliminary to the onset of a disease in a person.*

Sputum cup: *is a vessel provided by hospitals to patients to spit into.*

Staphylococcal infections: *are caused by staphylococcus bacteria. These are contagious in nature. Common symptoms include boils and oozing blisters. Staphylococcal bacteria may also cause food poisoning, resulting in nausea, vomiting and stomach ache.*

TABC vaccine: *is a class of combination vaccines against typhoid–paratyphoid (TAB) or typhoid–paratyphoid–cholera (TABC).*

Tourniquet: *is a band used for completely stopping blood flow from a wound.*

Topical antiseptic: *is an anti-microbial agent that kills or checks microbial infestations. It is applied onto wounds to check infections.*

X–rays: *refer to electromagnetic waves that are used to examine body parts like bones and joints for fracture or swelling or any other deformity. X–ray imaging forms pictures of the inside of the body. These images show the body parts in shades of black and white.*

List of Credits

Unit 1

Fig. 1.1: Government J. P. Hospital, Bhopal
Fig. 1.2: J.K. Hospital, Bhopal
Fig. 1.3: Government J. P. Hospital, Bhopal
Fig. 1.4: https://goo.gl/oD57pH

Unit 2

Fig. 2.2: Government J. P. Hospital, Bhopal
Fig. 2.3: Government J. P. Hospital, Bhopal
Fig. 2.4: Government J.P. Hospital, Bhopal
Fig. 2.5: Government J.P. Hospital, Bhopal
Fig. 2.8: Government J. P. Hospital, Bhopal
Fig. 2.9: Government J. P. Hospital, Bhopal
Fig. 2.10: Government J.P. Hospital, Bhopal

Unit 3

Fig. 3.1: Government J.P. Hospital, Bhopal
Fig. 3.3: Government J.P. Hospital, Bhopal

Unit 4

Fig. 4.3: Government J.P. Hospital, Bhopal

Answer Key

Unit 1: Handling Emergency Services

Session 1: Responding to Emergency Calls and Admissions

A. Fill in the Blanks

1. General Duty Assistant
2. doctor on call
3. ambulance
4. 108

Session 2: Receiving Emergency Patients in a Hospital

A. Multiple Choice Questions

1. (a) 2. (d) 3. (d) 4. (a)

Session 3: Handling and Monitoring Patients during Disasters

A. Fill in the Blanks

1. command and control centre
2. hospital superintendent
3. Surge capacity
4. Human resource
5. red
6. green

Session 4: Transportation of Injured Patients

A. Fill in the Blanks

1. internal, external
2. internal
3. Closed reduction
4. plaster

Unit 2: Disinfection and Sterilisation

Session 1: Prevention and Control of Hospital Associated Infections

A. Fill in the Blanks

1. nosocomial
2. sterilisation
3. PPE
4. Aseptic technique

Session 2: Disinfecting the Ward and Equipment

A. Fill in the Blanks

1. Integrated Pest Management
2. Sterilisation
3. radiation
4. Disinfection

Session 3: Disinfecting the Patient Treatment Area

A. Multiple Choice Questions

1. (c) 2. (b)

B. Match the Columns

1. (b) 2. (c) 3. (a)

Session 4: Care and Cleaning of Articles

A. Fill in the Blanks

1. milk
2. Stainless steel
3. 121° C, 15 minutes
4. lemon juice, Hydrogen peroxide and bleaching powder

B. Match the Columns

1. (d) 2. (a) 3. (c) 4. (b)

Unit 3: Community Health Care

Session 1: Introduction to Communicable Diseases

A. Fill in the Blanks

1. infection 2. fever 3. direct contact 4. Water

Session 2: Immunisation

A. Fill in the Blanks

1. Immunity
2. vaccine, antibodies
3. Universal Immunisation Programme
4. cold chain
5. pulse polio

Session 3: Basic Needs of the Elderly

A. Fill in the Blanks

1. attention
2. appetite, bone
3. 138 million
4. short, simple

Session 4: Taking Care of Common Problems of the Elderly

A. Fill in the Blanks

1. Chronic Obstructive Pulmonary Disease
2. lotion, dryness
3. Pneumonia
4. exercise, physiotherapy
5. Pressure ulcers

Session 5: Forms and Routes of Medication

A. Fill in the Blanks

1. Sublingual
2. liquid
3. metered-dose, turbo
4. buccal

Unit 4: Biomedical Waste Management

Session 1: Introduction to Biomedical Waste

A. Multiple Choice Questions

1. (d) 2. (a) 3. (d) 4. (b)

Session 2: Segregation, Transportation and Disposal of Biomedical Waste

A. Multiple Choice Questions

1. (b) 2. (d) 3. (a) 4. (c)

Session 3: Role of the Hospital Staff in Biomedical Waste Management

A. Fill in the Blanks

1. medical superintendent
2. waste management officer in-charge
3. medical waste
4. in-charge sanitary inspector

Unit 5: Medical Record keeping

Session 1: Importance of maintaining Medical Records

A. Fill in the Blanks

1. medical record
2. continuity, quality
3. evidence
4. medical research

Session 2: Process of Medical Record keeping

A. Fill in the Blanks

1. chief medical complaints
2. health
3. change of shift report
4. Leaving Against Medical Advice

Session 3: Maintenance of Medical Records

A. Fill in the Blanks

1. source oriented medical record
2. doctor's order sheet
3. medical records
4. nursing discharge summary

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