PONDICHERRY UNIVERSITY DIRECTORATE OF DISTANCE EDUCATION



Hospital Operations Management



SEMESTER III

MBHM3004

MBA – HOSPITAL MANAGEMENT

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Introduction

With increasing scientific, technological, and medical advancement, the healthcare sector is continuously observing an extensive transformation. Now, hospitals have become more dynamic, structured, and specialised structures that plan, design, and operate various hospital processes and functions.

Hospital Operations Management is all about integrating various scientific principles of management with an aim to determine the most efficient measures of delivering patient care. As a discipline, hospital operations management consists of all functions that are associated with the management systems and business processes of clinical care. It focuses on workflow, facility layout, capacity design, staffing levels, division of departments, productivity management, supply chain and logistics management, quality management, and process engineering.

In general, hospital operations management aims to plan and control processes that transform inputs or resources into outputs or healthcare services. Inputs may include resources and assets, such as capital, labour, technology, human resource, space, equipment, and information. On the other hand, output may include the actual production and delivery of healthcare services. The healthcare operations management ensures that adequate resources are applied to generate good quality of services.

The healthcare operations management consists of three generic processes that transform input into output. These processes include clinical, management, and ancillary processes. The clinical processes are the most important processes in any healthcare facility as they are directly linked with the planning and controlling of resources used for diagnosis and treatment of patients. The management process is needed to support clinical processes by organising and managing various departments, staff, and supply chain. Ancillary processes are other important processes in any hospital that help in supporting the general functioning of the hospital. Ancillary processes include services related to housekeeping, food, laundry and linen etc. Hospital operations management involves planning and controlling various available resources, within each of these processes.

The book **Hospital Operations Management** aims at making students aware of different aspects of operations management in a healthcare facility. It enables students to understand the concepts of hospitals and medical record documentation. The book also explains how to plan and design various clinical, diagnostic, and nursing services. In addition, the book elaborates on various services that come under ancillary and auxiliary processes. The book also explains various aspects of facilities planning for hospital operations management. Towards the end, the book elaborates on how to incorporate an effective material management program in a hospital. Pownichterer

Syllabus

Syllabus

MBA (Hospital Management) - III Semester

PAPER - XIV

HOSPITAL OPERATIONS MANAGEMENT

Paper Code: MBHM3004

Objectives:

- To identify the important functions and its management in Hospitals
- To familiarise with the supporting services and procurement management of Hospitals

UNITI

Front Office - Admission - Billing - Medical Records - Ambulatory Care- Death in Hospital - Brought-in Dead - Maintenance and Repairs Bio Medical Equipment

UNIT II

Clinical Services - Clinical Departments - Out patient department (OPD) - Introduction - Location - Types of patients in OPD - Facilities - Flow pattern of patients - Training and Co-ordination; Radiology - Location - Layout - X-Ray rooms - Types of X-Ray machines - Staff - USG - CT - MRI - ECG.

UNIT III

Supporting Services - House Keeping - Linen and Laundry, - Food Services - Central Sterile Supply Department (CSSD)

UNIT IV

Facility Location and Layout importance of location, factors, general steps in location selection -Types of lay outs – product, process, service facility layout-Work standards, techniques of work measurement-Work sampling, calibration of hospital equipments. Productivity measures, value addition, capacity utilization, productivity – capital operations, HR incentives calculation, applications in hospital.

UNIT V

Purchasing strategy process – organizing the purchasing function – financial aspects of purchasing – tactical and operational applications in purchasing, Inventory Management: valuation and accounting for inventory – physical location and control of inventory – planning and replenishment concepts – protecting inventory; Value Management, Value engineering, value analysis.

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Table of Contents

Unit I: Introduction to Hospital Operations

1.	Heal	thcare Operations Management	1
	1.1	Introduction	2
	1.2	Evolution and Classification of Hospitals	3
		1.2.1 Classification of Hospitals	3
	1.3	Hospital as a System	4
	1.4	Hospital as an Organisation	7
	1.5	Functions of Hospital	8
	1.6	Concept of Hospital Operations Management	10
		1.6.1 Key Functions of Hospital Operations Management	10
		1.6.2 Need for Hospital Operations Management	11
		1.6.3 Medical Staff and Hospital Organisation	12
		1.6.4 Goals of Operations Manager	13
	1.7	Trends in Hospital Operations Management	14
	1.8	Summary	16
	1.9	Glossary	17
	1.10	Terminal Questions	18
	1.11	Answers	18
	1.12	Case Study: Continuous Improvement in Hospital Operations Management	19
	1.13	References and Suggested Readings	20
~			~ 4
2.	Med	Ical Record Documentation	.21
	2.1	Introduction	22
	2.2	Role of Front Office in Medical Record Documentation	22
		2.2.1 Authorship Validation and Medical Record Documentation	23
	2.3	Patient Identification and Admission	24
		2.3.1 Identification Policy on Admission	24
		2.3.2 Types of Hospital Admissions	25
	2.4	Billing	26
	2.5	Medical Record Maintenance	27
		2.5.1 Brief Sheet	27
		2.5.2 Medical History Form	28
		2.5.3 Physical Examination	28
		2.5.4 Laboratory Reports	29
		2.5.5 Statistics	29
		2.5.6 Other Records	29
		2.5.7 Hospital Libraries	29
	2.6	Record Amendments and Corrections	30
	2.7	Discharge Documentation	31
	2.8	Documentation of Death	32
		2.8.1 Death in Hospital	32

	2.8.2	Brought-in Dead	33
	2.8.3	Certification of Death	33
2.9	Biome	edical Equipment Maintenance and Management	33
2.10	Summ	iary	35
2.11	Gloss	ary	35
2.12	Termi	nal Questions	36
2.13	Answe	ers	36
2.14	Case S	Study: A Case of Poor Medical Record Documentation	38
2.15	Refere	ences and Suggested Readings	38

Unit II: Planning and Designing Medical Services: Clinical, Diagnostic and Nursing Services

3.	Clini	ical Services	
	3.1	Introduction	
	3.2	Concept of Clinical Services and Clinical Departments	
	3.3	Outpatient Department (OPD)	
		3.3.1 Location and Design of OPD	
		3.3.2 Flow Pattern of Patients	
		3.3.3 Training and Co-Ordination	
	3.4	Emergency Department	
		3.4.1 Location and Design	
		3.4.2 Features of an ED	
		3.4.3 Managing an ED	
		3.4.4 Physical Facilities in ED	
	3.5	General Medical Department	
		3.5.1 Therapy	
		3.5.2 General Medical and Nursing Care	
		3.5.3 Paediatrics	
		3.5.4 Psychiatry	
		3.5.5 Neurology	
		3.5.6 Cardiology	
		3.5.7 Dermatology	
		3.5.8 Pathology	
		3.5.9 Enterology	
		3.5.10 Blood Bank	
		3.5.11 Physical Medicine	
		3.5.12 Urology	
		3.5.13 Communicable Diseases	
		3.5.14 Epidemiology	
		3.5.15 Tropical Diseases	
		3.5.16 Gynaecology	
		3.5.17 Ear, Nose and Throat (ENT) And Orthopaedics	
		3.5.18 Chronic Diseases	
	3.6	Surgical Department	
	3.7	Maternity Department	

Table of Contents

	3.8	Dental Department	55
	3.9	Summary	55
	3.10	Glossary	56
	3.11	Terminal Questions	56
	3.12	Answers	56
	3.13	Case Study: Clinical Services Implemented by the Afghan Government	57
	3.14	References and Suggested Readings	
4.	Diag	nostic Services	
	4.1	Introduction	60
	4.2	Clinical Pathology and Laboratory Department	60
		4.2.1 Haematology and Blood Bank Unit	61
		4.2.2 Urine Analysis Unit	63
		4.2.3 Histology and Microscopy Unit	63
		4.2.4 Serology–Bacteriology Unit	64
	4.3	Radiological Department	64
		4.3.1 Overview	64
		4.3.2 Functions	65
		4.3.3 Location and Design	
		4.3.4 X-Ray Rooms	
		4.3.5 Types of X-Ray Machines	
		4.3.6 Radiation Therapy Staff	
		4.3.7 Ultrasonography (USG)	69
		4.3.8 CT Scan	69
		4.3.9 MRI	71
		4.3.10 ECG	
	4.4	Summary	73
	4.5	Glossary	73
	4.6	Terminal Ouestions	73
	4.7	Answers	
	4.8	Case Study: Diagnostic Services at Henry Ford Health Services	75
	4.9	References and Suggested Readings	
5.	Nurs	sing Services	77
	5.1	Introduction	78
	5.2	General Nursing Unit	78
		5.2.1 Functions	78
		5.2.2 Location	79
		5.2.3 Design	79
		5.2.4 Organisation	80
		5.2.5 Facilities and Space Requirements	80
	5.3	Paediatric Nursing Unit	
		5.3.1 Location	
		5.3.2 Design	
	5.4	Obstetrical Nursing Unit	
		5.4.1 Location	

ix

	5.4.2	Facilities and Space Requirements	
5.5	Psych	iatric Nursing Unit	
	5.5.1	Functions	
	5.5.2	Location	
	5.5.3	Design	
	5.5.4	Organisation	
	5.5.5	Facilities and Space Requirements	
5.6	Isolati	ion Rooms	
	5.6.1	Location	
	5.6.2	Design	
5.7	Intens	sive Care Units (ICU)	
	5.7.1	Functions	
	5.7.2	Location	
	5.7.3	Facilities and Space Requirements	89
	5.7.4	Code Blue Team and Code Blue Alarm	
5.8	Coron	nary Care Units (CCUs)	
5.9	Newb	orn Nurseries	93
	5.9.1	Full-Term Nursery	
	5.9.2	Observation Nursery	
	5.9.3	Premature Nursery	93
	5.9.4	Utilities	
5.10	Summ	nary	94
5.11	Gloss	ary	
5.12	Term	inal Questions	
5.13	Answ	ers	
5.14	Case S	Study: Evaluation of Outsourcing in Nursing Services, Kashani Hospital, Isfahan	96
5.15	Refere	ences and Suggested Readings	97

Unit III: Planning and Designing Medical Services: Ancillary and Auxiliary Services

6.	Ancill	Ancillary Services		
	6.1	Introduction		
	6.2	Concept of Ancillary/Supportive Services		
	6.3	Admitting Department	101	
	6.4	Medical Records Department	103	
		6.4.1 Functions of the Medical Records Department	104	
		6.4.2 Medical Coding	104	
		6.4.3 Retention of Medical Records	105	
		6.4.4 Destruction of Records	105	
	6.5	Central Sterilisation and Supply Department (CSSD)	106	
		6.5.1 Objectives of the CSSD	106	
		6.5.2 Functions of the CSSD	107	
		6.5.3 Location and Design of the CSSD		
		6.5.4 Facilities and Space Requirements of the CSSD		

Table of Contents

	6.6	Pharmacy Department	
		6.6.1 Functions of the Pharmacy Department	
		6.6.2 Types of Pharmacy	
		6.6.3 Facilities Required by a Pharmacy	
		6.6.4 Hospital Formulary	
	6.7	Food Services/Dietary Department	
		6.7.1 Design and Layout of the Dietary Department	
	6.8	Laundry and Linen Service Department	
	6.9	Housekeeping Department	
	6.10	Summary	
	6.11	Glossary	
	6.12	Terminal Questions	
	6.13	Answers	
	6.14	Case Study: Somerset Hospitals Food Service	
	6.15	References and Suggested Readings	
7	A !	line Condese	447
7.	AUXI	liary Services	
	7.1	Introduction	
	7.2	Concept of Auxiliary Services	
	7.3	Public Relations Department	
		7.3.1 PR: Role and Importance	
	_	7.3.2 Different Types of PR Services	
	7.4	Welfare and Religious Services	
		7.4.1 Importance of Welfare and Religious Services	
	7.5	Hospital Safety and Security Management	
		7.5.1 Importance of Hospital Safety and Security Management	
		7.5.2 Types of Safety and Security Management	
	7.6	Management of Hospital Parking Problems	
		7.6.1 Need of Parking Management in Hospitals	
		7.6.2 Design and Location	
	7.7	Patient Access Services	
		7.7.1 Need of Patient Access Services	
		7.7.2 Design and Location	
	7.8	Hospital Transport Services	
		7.8.1 Functions of a Hospital Transport Service Department	
	7.9	IT and Telemedicine Services	
		7.9.1 Requirement of Telemedicine and IT Unit	
		7.9.2 Design and Location	
	7.10	Summary	
	7.11	Glossary	
	7.12	Terminal Questions	
	7.13	Answers	
	7.14	Case Study: Canberra Hospital Auxiliary Services	
	7.15	References and Suggested Readings	

xi

Unit IV: Facilities Planning for Hospital Operations Management

8.	Location and Layout Selection		135
	8.1	Introduction	
	8.2	Selecting a Suitable Location for Facility Setup	136
		8.2.1 Factors to be Considered while Selecting Facility Location	
	8.3	Process of Selecting Location	
		8.3.1 Checklist Analysis	
		8.3.2 Analysing Infrastructure and Taking Permission from Authorities	
		8.3.3 Locating Alternative Sites and Making Selection	
	8.4	Layout for Hospitals	
		8.4.1 Significance of Location Layout	
		8.4.2 Types of Layouts	
	8.5	Summary	
	8.6	Glossary	
	8.7	Terminal Questions	
	8.8	Answers	
	8.9	Case Study: Facility Design at Stobhill Hospital	
	8.10	References and Suggested Readings	
9.	Man	aging Productivity and Measuring Performance	149
	9.1	Introduction	150
	9.2	Forecasting Patient Demand	150
	9.3	Capacity Analysis and Utilisation	153
	9.4	Common Hospital-Wide Productivity Metrics and Work Standards	154
		9.4.1 Work Standards in Hospitals	
		9.4.2 Measuring Performance of Hospital Services	
	9.5	Productivity Measures	156
	9.6	Improving Productivity	
	9.7	Principles of Productivity Management	
	9.8	Work Measurement: Technique for Improving Productivity	
		9.8.1 Work Sampling	
		9.8.2 Calibration of Hospital Equipment	
	9.9	HR Incentives Calculation and its Applications in Hospital	
	9.10	Value Addition Service in Hospitals	
	9.11	Summary	
	9.12	Glossary	
	9.13	Terminal Questions	
	9.14	Answers	
	9.15	Case Study: Productivity Issues at Marlborough Hospital	
	9.16	References and Suggested Readings	
10.	Heal	thcare Finance for Operations Manager	165
	10.1	Introduction	
	10.2	Capital Operations in Healthcare Sector	

Table of Contents

		10.2.1 Identifying Capital Fund Sources	167
		10.2.2 Role of a Capital Operations Manager	167
		10.2.3 Designing a Capital Planning and Implementation Project	
	10.3	Profit Margins	
		10.3.1 Profit Margins - A Reactive Response to Changes in Supply and Demand Dynamics	
	10.4	Income Statement	
		10.4.1 Revenue Earners for Hospitals	
		10.4.2 Understanding Hospital Expenses	
	10.5	Balance Sheet	
		10.5.1 Key Factors of Balance Sheet	
	10.6	Working Capital	174
		10.6.1 Managing Capital for Productive Results	174
	10.7	Financial Distress in Healthcare	174
		10.7.1 Identifying Reasons for Financial Distress in Healthcare	174
		10.7.2 Resolving Financial Distress	175
	10.8	Cash Flow Statement	176
		10.8.1 Intended Audience for Cash Flow Statement	177
		10.8.2 Use of Cash Flow Statement in Planning Growth Models	177
	10.9	Debt in Healthcare	178
	10.10) Summary	178
	10.11	1 Glossary	179
	10.12	2 Terminal Questions	
	10.13	3 Answers	
	10.14	4 Case Study: Narayana Hrudayala Hospitals for Cardiac Care - An Example of Efficient Financial Operations and Quality Health Care at Affordable Cost	
	10.18	5 References and Suggested Readings	
Uni	t V: Efi	fective Material Management Programme	
11.	Purc	hasing and Material Management	185
	11.1	Introduction	
	11.2	Purchasing Strategy	
		11.2.1 Centralised Purchasing	
		11.2.2 Tactical and Operational Decisions in Purchasing	
		11.2.3 Functions of the Purchasing Department in an Organisation	
	11.3	Receiving the Material	
	11.4	Inventory Management	
		11.4.1 Physical Location Planning	
		11.4.2 Facilities and Space Requirements	
		11.4.3 Valuation and Accounting for Inventory	
	11.5	Inventory Control	191
	11.6	Inventory Replenishment	193
		11.6.1 Perpetual Inventory System	
	11.7	Distribution Concepts	194
	11.8	Product Standardisation	194

11.

xiii

11	1.9 Vendor Evaluation	195
	11.9.1 Prime Vendor Contract	
11	1.10 Protecting Inventory from Theft, Fraud and Kickback	197
11	1.11 Value Management, Value Engineering and Value Analysis	198
11	1.12 Summary	
11	1.13 Glossary	
11	1.14 Terminal Questions	
11	1.15 Answers	
11	1.16 Case Study: Impact of Efficient Supply Chain Management on Bottom Line Profitability, Kaiser Permanente (KP) Medical Care Organisation, Oakland, California, USA	
11	1.17 References and Suggested Readings	
XIV DDE,	Pondicherry University, Pondicherry	

CHAPTER



Healthcare Operations Management

Stru	cture	
1.1	Introduction	
	Learning Objectives	
1.2	Evolution and Classification of Hospitals	
1.3	Hospital as a System	
1.4	Hospital as an Organisation	
1.5	Functions of a Hospital	
1.6	Concept of Hospital Operations Management	
1.7	Trends in Hospital Operations Management	
1.8	Summary	
1.9	Glossary	
1.10	Terminal Questions	
1.11	Answers	
1.12	Case Study: Continuous Improvement in Hospital Operations Management	
1.13	References and Suggested Readings	

Notes

Learning Objectives

After completing this chapter, you will be able to:

- Discuss the progression and classification of hospitals
- Explain the concept of hospital as a system
- Discuss the concept of hospital as an organisation
- **Explain the major functions of a hospital**
- Discuss the concept of hospital operations management
- List new trends in hospital operations management

1.1 Introduction

Before delving into the concept of hospital operations management, let us first understand the concept of operations management. Operations management, according to Slack et al. 2010, is an activity where one manages resources that help produce and deliver goods and services. The part of any organisation that is devoted to the production or delivery of goods and services is called **operations function**. Therefore, operations management is a process that combines and transforms the available resources of an organisation, such as men, machine, and material, into value-added products and services. It helps an organisation to produce the right quantity at the right time and cost; thereby increasing organisational efficiency and effectiveness.

A hospital, big or small, is also considered as an organisation, as it also undertakes operations activities to provide health care services. Hospitals are complex organisations that tend to start functioning at a negative margin and take up measures such as cutting down costs, employees and put any up gradation plans on hold.

Hospital operations management is relatively a new concept in the health care industry. It denotes to a process that integrates and transforms resources used in a hospital into valueadded health care services with the requisite quality level. For example, a hospital uses doctors, nurses, medical equipment, and diagnostic and surgical procedures as inputs to produce healthy people as the desired output. Therefore, hospital operations management helps hospitals in determining the most efficient and optimal method to support patient care services. In addition, it helps in improving employee productivity, reducing patient wait time and refining the overall patient experience. All of this ultimately improves the image of the hospital and stabilise its financial health.

With rising customer expectations, health care quality and patient care have become a significant, attention-drawing issue around the world. Quality defines both success and failure for doctors, hospitals and the administrators who lead the healthcare industry. Many healthcare organisations conclude that traditional approaches to define and organise quality assurance functions in healthcare are no longer adequate. Therefore, today, the hospital operations management of most of the hospitals are focusing on 'continuous quality improvement' to improve performance by eliminating poor quality services; rather than trying to fix the outcomes of poor service delivery. The hospital operations management of the healthcare organisations are also increasingly setting process specifications for monitoring performance, determining quality, wastage and low productivity and eliminating variations. In this chapter, you will study about the importance of hospital operations management in detail.

1.2 Evolution and Classification of Hospitals

The history of hospitals is more than 2500 years old. The ancient Egyptian temples have been documented as institutions where the sick people were cured. Even ancient India had special houses where medicine and charity was distributed. Old people, cripples, widows, maimed people, orphans, etc. used to live in these houses, where they got medical help and food. These houses were documented by the Chinese traveller Fa Xian in 400 CE.

Diving more into the history, you will find the earliest surviving encyclopaedia of medicine in Sanskrit, called the Carakasamhita (Compendium of Caraka), which describes the building of a hospital dated between 100 BCE and CE 150. Dr. Dominik Wujastyk of the University College London says that charity houses in India are the oldest civic hospital system in the world. This is supported by the description by Caraka, about the way a clinic should be equipped and operated. Apart from this, the text written in the 6th century A.S., Mahavamsa, states that King Pandukabhaya of Sri Lanka built hospitals and lying-in-homes across his country. This proves there were institutions dedicated towards patient care in the ages Before Christ (BC).

Therefore, it can be said that the historic review of hospitals, though episodic and roughly organised, presents critical development in the history of medicine and therapeutics. In each era, hospitals worked as a community that is engaged in providing mechanisms for dealing with disease and death.

Initially, hospitals were recognised as a house of mercy, refuge, and dying. Space was provided to victims for physical protection and spiritual comfort. Hospitals were also used to provide rest, food, clothing, care and medical consultation to the poor, sick, and homeless people. By the time of Renaissance, hospitals were started seeing as a house of rehabilitation. They now have become a mechanism for both physical and mental recovery.

By the 18th century, hospitals became a house of cure where more attention was paid on medical and surgical treatment. Eventually, hospitals started participating in the education of medical and nursing profession to create new knowledge about health and disease. Medical students had to practice for at least one and a half years at a hospital as a part of their medical training according to the Apothecaries Act in 1815. The comprehensive system of medical conduct, 'Medical Ethics, or a Code of Institutes and Precepts, Adapted to the Professional Conduct of Physicians and Surgeons, was penned by Dr. Thomas Percival in 1803.

Hospitals and other allied fields became more streamlined and professional in the mid-19th century that turned hospitals into complex organisations. Hospital management has now become more organised and these institutes began to adapt more administrative systems into their organisations. The 19th century also experienced expansion in medical science with advancement in diagnostic tools. Hospitals were now able to increase their patient intake and were built with private as well as public fund contributions.

1.2.1 Classification of Hospitals

As mentioned earlier, hospitals have evolved from being simple houses to care for the sick to institutions meant for recovering health. Today, based on various kinds of treatments and facilities, hospitals can be classified into different types, which are as follows:

 General hospitals: These hospitals provide treatment for various kinds of diseases as well as injuries. These hospitals generally have a well-equipped emergency department to provide medical emergency services. For example, a military hospital that gives treatment to all kinds of cases comes under the category of general hospitals.

Notes

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- **Specialised hospitals:** These hospitals provide specific treatment for a particular illness, disease or injury. In this way, these hospitals provide specialised services to their patients. A few examples of such hospitals include orthopaedic hospitals, maternity hospitals, children's hospitals, trauma centres, rehabilitation centres, cardiac hospitals, mental hospitals, etc.
- ◆ Teaching hospitals: These hospitals have a medical college affiliated to them and provide teaching assistance to medical students, nurses as well as staff. All India Institute of Medical Sciences (AIIMS) in New Delhi is one example of such type of hospitals. In addition, Sir Sunderlal Hospital in Varanasi is also an example of a teaching hospital, affiliated with the Institute of Medical Sciences (IMS), Banaras Hindu University.
- Clinics and dispensaries: These are small medical facilities where doctors carry out their private practice. They generally do not provide specialised treatments or admit patients. For example, Lansing Ophthalmology is a well-known eye care clinic located in Michigan, America.

In addition to this, hospitals are also classified according to the system of treatment provided, like allopathic, homeopathy, Ayurveda, naturopathy, and yogic. The size of the hospital also helps to classify them, such as small hospitals with 25-50 beds or large hospitals with 300 or more beds. Ownership of the hospital is another parameter to classify hospitals into government hospitals or privately owned hospitals.

🔀 Self-Assessment Questions

- 1. By the 18th century, hospitals became a house of cure where more attention was paid on medical and surgical treatment. (True/False)
- **2.** Orthopaedic hospitals, maternity hospitals, children's hospitals, trauma centres, etc. are examples of:
 - a. General hospitals
 - b. Specialised hospitals
 - c. Teaching hospitals
 - d. Clinics and dispensaries
- **3.** _____hospitals have a medical college affiliated to them and provide teaching assistance to medical students, nurses as well as staff.

1.3 Hospital as a System

As a part of the healthcare industry (medical industry), hospitals denote to facilities that offer goods and services for the treatment of patients with preventive, curative, rehabilitative and palliative care. **WHO** defines a hospital as "An integral part of a social and medical organisation, the functions of which are to provide the population complete health care, both curative and preventive without patient services reaching out to the family in its own environment and also to carry out training of health workers/functionaries and the biosocial research."

Today, the healthcare industry is one of the world's largest growing industries, consuming over 10 per cent of gross domestic product (GDP) of most developed nations. The healthcare industry is not just growing but also witnessing many changes in the current healthcare environment. However, despite this growing pace of change and struggle to manage it, many Notes

hospitals are still locked in the 18th century crafts person model of work with fragmented and disjointed systems. Changing this requires a dramatic paradigm shift to a patient-centric system. This change needs revolution, rather than evolution.

Our current paradigm of healthcare systems, structures, processes and culture are referred to as the First Curve of the healthcare sector. In the First Curve, the healthcare industry is rooted in the 'craft' and its growth reflects the initial stages of industrial design. However, many healthcare delivery systems have begun focusing on the Second Curve of development which consists of a more evolved set of systems, hospitals, and process designs that are aimed at the increasing demands of funders, service providers, and customers. Let us examine this shift from the First to Second Curve in the healthcare delivery paradigm.

The healthcare industry's first paradigm shift started with William Osler and his colleagues at Johns Hopkins Hospital late in the 19th century. They ushered medical and surgical interventions for cure and care. However, as demonstrated in a series of **Institute of Medicine (IOM) Reports**, "*These wonders of modern medicine have brought not just the ability to cure, but the ability to bring harm to patients as a result of lingering complexity, fragmentation and lack of strategic goal alignment.*" Some of the assumptions and beliefs that characterise First Curve are:

- Care is organised around provider needs.
- The public will come to the service provider.
- Care provided in response to individual patient needs.
- Quality is defined in terms of disease and mortality and there is resistance to public data disclosure.
- Quality is outlined around professional skills.
- The healthcare service provider's intentions are always proper; based on a 'do no harm' belief system.
- Human error produces harm but the threat of punishment is an effective restriction.
- Complexity makes it easy to make errors.
- Problems are fixed through criticism and re-training.
- Systems are fragmented.
- Health records are fragmented, inadequate and discrete.
- Information is centralised and hierarchical.
- Billing and payment systems are complex, bewildering and difficult to understand.
- Repayment systems mostly lack vision on quality and value, rewarding volume.
- Huge resources are consumed by inefficient systems, incurring waste, error and cost.
- Healthcare is isolated and structurally in a nascent stage.
- Medical error, death and harm are common.
- Quality coupled with high cost.

This multi-trillion dollar industry is still built on such a pre-industrial craft model. Considering the shortcomings of the First Curve, most hospitals are now aligning with the Second Curve to include essential physical and informational changes in infrastructure. The Second Curve is expected to change many beliefs and assumptions of the First Curve.

Notes

Some of the major characteristics of the Second Curve include:

- Healthcare services designed around patient needs.
- Healthcare services providers reach out to the public.
- Attention to population needs while retaining responsiveness to individual needs.
- Inclusion of satisfaction, function and value to expand the definition of quality.
- Reducing risk with essential quality infrastructure.
- Acknowledgement that humans are imperfect and errors occur in spite of the best intentions; learning from mistakes.
- Well-structured workplace and processes make it easy to do the thing right and hard to do things wrong.
- Problems are resolved by redesigning systems that help in becoming more supportive of human need.
- Consent regarding a variety of key measures including access to care, clinical outcomes, functionality, satisfaction and value received.
- Systems and care are combined holistically.
- Health records are electronic, promptly updated and available to all patients and healthcare service providers.
- Information can be accessed by patients and healthcare service providers.
- Payments are clear, web-facilitated and easy to transact.
- Resources are allocated for innovation and quality improvement.

This transition to the Second Curve is not a smooth one. Hospitals need to redesign their central structures, processes and support systems. The Second Curve cannot be attained until the delivery system and the hospital's components are purposely designed with totally new assumptions.

Self-Assessment Questions

- 4. Our current healthcare systems, structures, processes and culture are referred to as the ______ paradigm.
 - a. "First Curve"
 - b. "Second Curve"
 - c. "Third Curve"
 - d. "Fourth Curve"
- 5. 'The public will come to the service provider,' is an assumption related with the second curve. (True/False)
- 6. 'Humans are imperfect and errors occur in spite of best intentions', is an assumption related with the second curve. (True/False)
- 7. Organisations that wish to gain Second Curve results should redesign their _

1.4 Hospital as an Organisation

An organisation is a framework in which individuals unite to achieve shared objectives. Participants believe that they can better satisfy their requirements by joining a collective effort. Within an organisation, personal objectives are set aside in favour of group objectives, and group objectives are adjusted for organisational goals, all with the aim of maximizing benefits through the efficient use of limited resources.

As an organisation, hospitals are relatively different from other types of organisations, such as industrial or manufacturing organisations. Hospitals are usually defined in the context of a social and economic setting in which they actually operate. This denotes to all external conditions and factors that are considered by the organisation. These factors include:

- External environment: It includes all the constraints and opportunities that are required to be analysed for designing an organisation. The external environment comprises political, demographic, natural economic, socio-culture, and technological factors. An organisation requires constant caution and adaptability to effectively manage situations arising due to such factors. As an organisation, it is of utmost importance for organisations to take into consideration these external factors while making any decisions. In addition, a hospital, as an organisation should answer the following questions:
 - What economic, political and legal factors can put a considerable impact upon a healthcare organisation?
 - What are the basic demographic and socio-cultural factors that may affect the service design of the hospital?
 - What are the new technological developments in the medical field that are required to be adopted by the hospital?
- **Organisational assessment/ internal environment:** It includes evaluating the mission and vision statements of a hospital with respect to its future goals and objectives. It also assesses strategies that the hospital develops with respect to the quality, quantity, and types of services to be provided. In this way, organisational assessment tends to identify the current structure and internal processes of the hospital.
- Human resource: It involves evaluating the capabilities of manpower working in the hospital. It is necessary to assess the performance of professionals working in the hospital so that the goals of the organisation can be met without any hindrances. In addition, it also helps in implementing desired changes in the organisational structure.
- Political process: It refers to an organised assessment of internal and informal aspects
 of the hospital. It includes informal groups and leaders that help in identifying hospital
 needs and support the management in planning and decision making.

There are five major components of an organisation that are applicable on hospitals too. These components include:

- **Task:** It is a piece of work that is in alignment with the objectives of an organisation. When a group of carry out a work for the purpose of meeting hospital's objectives, the hospital is said to have come into existence. All of the tasks that are within the boundaries of the organisation are completed with the assistance of the individuals who are employed by that particular hospital.
- People: Individuals who are employed by a hospital in order to accomplish its goals and objectives are referred to by this term. Both as individuals and as members of a group, they perform their duties.

Notes

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- Structure: It refers to a configuration in which individuals collaborate in order to transform the system into an organisation. Among the components of the structure is the hierarchy the reporting mechanism, the reward system, and the workplace setup. The employees are dependent on one another in order to achieve their objectives; hence, it is essential that they be connected to one another in a structural manner in order to ensure that their efforts are adequately coordinated with one another. The hierarchy of an organisation guarantees that there is an appropriate mechanism for reporting between those on higher positions and those at lower positions. Because of this, managers have a responsibility to make certain that the structure is built in such a way that it satisfies the requirements of the organisation.
- **Technology:** Every organisation makes an attempt to stay in tune with the most recent technological advancements in order to maximise their production and profitability, as well as to gain a competitive advantage over other organisations.
- **Environment:** It can be influenced by both internal and external elements that are present in an organisation. The fact that an organisation does not operate in a vacuum means that it must also take into consideration external issues in addition to the internal factors that it must address.

Self-Assessment Questions

- 8. _____refers to a structure in which people come together to attain some common goals.
- **9.** The internal environment comprises political, demographic, natural economic, socioculture, and technological factors. (True/False)
- **10.** ______refers to an organised assessment of internal and informal aspects of the hospital.
 - a. Organisational assessment b. Human resource
 - c. Political process d. External environment
- 11. List the five major components of an organisation that are applicable on hospitals too.

1.5 Functions of Hospital

As discussed earlier, hospitals are facilities used for providing curative and preventive care to grieved persons irrespective of race, religion, economic and social status. In addition to this, hospitals also provide teaching and educational programs to medical students and professionals. Based on such functions, hospitals are broadly categorised into two groups, shown in Fig. 1.1:



Fig. 1.1: Different Functions of a Hospital

Let us discuss these two types of functions of a hospital in detail.

Notes

- Intramural functions: These functions are performed by a hospital within its premises or territory. Intramural functions include:
- Therapeutic services: It includes:
 - Diagnostic functions aim to find and diagnose the disease or the cause of the disease with the help of invasive or non-invasive procedures.
 - Curative functions encompass any care provided to patients by the hospital staff such as the doctors, nurses, physical therapists, dieticians, and technicians, on an outpatient or inpatient basis. Health education to patients as well as the general public is also included in curative functions.
 - Rehabilitative functions such as physical therapy, counselling, occupational therapy, involve supportive care given to patients after a major injury or operation.
 - Emergency service is the most important function of a hospital. A patient coming into a medical emergency, such as major or minor trauma, injury, illness, accident victims, burn patients, poisoning cases, cardiac arrest, etc. receives lifesaving medical help from this department.
- Preventive services: These include:
 - Child clinics and vaccination centres
 - Antenatal and postnatal services
 - Family planning and welfare centres
 - Health education
 - Control of communicable diseases
 - Diabetic clinics
- Educational services: These include:
 - Undergraduate, postgraduate, and postdoctoral medical education services
 - Undergraduate, postgraduate, and doctoral nursing education
 - Speciality education
 - Paramedical college
 - Community healthcare seminars
- Research services: These include:
 - Clinical medicine related research
 - Hospital administration related research projects
- **Extramural functions:** These functions are performed by a hospital in the community or surrounding areas outside its territory. Extramural services include:
 - Homecare services for patients who require medical care at home by providing nursing services.
 - Health camps in schools, colleges, shopping malls, and rural areas.
 - Day care centres for performing minor medical procedures and operations such as eye care camps, dental camps, orthopaedic camps, etc.

Notes

Self-Assessment Questions

- 12. _____functions are performed by a hospital within its premises or territory.
- Health camps in schools, colleges, shopping malls, and rural areas are type of functions of a hospital.

Activity

Compare the functions of a private Indian hospital with that of a public one. Write a report of the comparison. Use the internet to avail necessary resources.

1.6 Concept of Hospital Operations Management

In simple words, operations management is a process whereby resources or inputs are transformed into intangible services such as banks, healthcare, railways, airlines etc. Operations management focuses upon administration, planning, and execution of operations involved in the production of goods and services. It also aims at simultaneously minimising resources and increasing output.

Hospital operations management can be defined as a process of designing, planning, executing and improving operations and systems to create and deliver healthcare services efficiently. It transforms inputs such as personnel, information, technology, equipment, and capital into healthcare services. The main aim of hospital operations management is to prepare the most effective and efficient system to deliver the organisation's health care services to patients. It also helps in improving the quality of services provided by hospitals.

According to **Timothy W. Butler, G. Keong Leong et al.** hospital operations management is "The policy of procurement and allocation of resources for the development of operational capabilities such as low costs; superior quality; flexibility; and prompt' dependable and accessible service deliver. The policy is consistent with the hospital mission and business strategy." Therefore, hospital operations management is a management discipline that aims to identify the most efficient and optimal steps to improve and support patient care services.

1.6.1 Key Functions of Hospital Operations Management

A task cannot be completed unless all the activities involved in it are performed in a systematic manner. The same principle applies to hospital operations management too. Besides, assigning the right task to the right person is another important aspect of hospital operations management. Controlling is another essential function of hospital operations management because it prevents the wastage of resources by identifying loopholes in operations and correcting them. Therefore, the key functions of hospital operations management can be broadly categorised into three areas, planning, controlling, and organising. Let us discuss these key functions of hospital operations management in detail:

• **Planning:** Planning is similar to a blue print of activities or a course of action that guides an operations manager in future decision making. The operations manager delineates the objectives for operational subsystems and also for the policies and procedures for achieving the objectives of the organisation. At this stage, activities, such as planning, designing, etc., are performed so that overall organisational objectives can be achieved successfully.

• **Organising:** Organising activities refer to the structure of differentiated tasks and authority. In a hospital, an operations manager determines the structure of roles and the flow of information within the subsystems of operations. It is their responsibility to set out the activities required to achieve goals and maintain a line of authority and responsibility.

• **Controlling:** Controlling refers to the governing of activities to ensure that the actual performance goes in accordance with the planned performance. Controlling also helps in ensuring that plans for subsystems of operations are accomplished.

Under these broad categories of hospital operations management, several sub-activities are performed that include:

- Planning and designing the physical layout of hospitals
- Managing workflow
- Staffing
- Improving quality
- Handling supply chain and logistics

1.6.2 Need for Hospital Operations Management

The main aim of hospital operations management is to produce the desired healthcare services in such a manner that the optimal utilisation of available resources is ensured. It also ensures that the right services are delivered in the right quantity, at the right place. Fig. 1.2 explains the need for hospital operations management:



Fig. 1.2: Need for Hospital Operations Management

Notes

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Now let us discuss the need of hospital operations management in detail:

- Producing the right kind of healthcare services: The quality of health care services depends on the needs of patients. This is because different patients require different level of treatments. Therefore, the services provided by health care centres should be responsive to individual patient preferences, needs and values.
- **Timeliness:** Timeliness refers to the timely delivery of final services to patients. It is one of the most important parameters in the hospital industry to judge the effectiveness of a hospital. Timely deliveries are possible only when medical staff ensures the optimal utilisation of available resources. Therefore, the services provided by the healthcare centres should help in reducing waiting times and delays in treatment.
- Efficient operations: Hospital operations management is also needed for ensuring efficient operation of tasks. Health care centres should avoid waste in equipment, supplies, ideas, and energy. In other words, health care centres should be efficient enough to provide quality services to their patients.
- **Risk appreciation:** Accepting risks and the extent to which efforts are taken for minimising risks affect the reliability of the organisation. Hospital operations management also aims to minimise risks involved in operations.
- Achieving steadily high quality: The process of achieving steadily high quality in the health care industry involves "doing the right thing correctly." This requires physicians, nurses and all practitioners to make the right decisions regarding health care services with the right amount of skills, judgment and timeliness of execution. Hospital operations management is also needed to ensure sustained high quality in all operations of the organisation.

1.6.3 Medical Staff and Hospital Organisation

Medical staff is one of the major factors that put the greatest impact on the quality of care provided by a hospital. It is the responsibility of a hospital administrator to monitor the quality of health care services, provided by the hospital staff. The medical staff of a hospital usually consists of highly trained and motivated professional groups including a panel of doctors and surgeons.

Coordinating the entire functions of medical staff is a challenging task for a hospital's administration. This is because the medical staff works as per the rules, regulations, and guidelines created by the hospital board and administration. For example, in America, hospitals work on the standards and guidelines developed by the Joint Commission on Accreditation of Healthcare Organisations (JCAHO), a monitoring body for assessing the quality care of hospitals. Unlike America, in India, there is a need to develop a monitoring body for assessing health care service quality and accrediting hospitals on that basis.

The aim of the accreditation programme in hospitals is to gain continuous quality improvement (CQI) and total quality management (TQM) within the organisation. Today, in many countries such as the United States, Australia, Canada and France, health care accreditation programmes are based on specific and predefined standards. The assessment of the extent to which a hospital fulfils the given standards is done by independent and trained surveyors. However, accreditation is only valid for a certain period of time, after which it needs to be renewed.

To monitor and regulate the medical staff, various committee methods, such as medical review committee, infection control, medical record, tissue committee can be established by hospitals. These committees help hospitals in assessing the quality of health care services and generating a committee report for the further assistance of hospital administration.

In hospitals, usually there are two lines of authority that function side-by-side. These two lines of authority include hierarchical line and professional line. The hierarchical authority has a well-defined structure and carries out the functions of hospital management. On the other hand, the professional line consists of medical professionals. The authority lies with the hierarchical line and the medical staff remains out of administrative bounds in most cases. This is because, in most hospitals, the medical staff does not involve full-time salaried employees. Most doctors visit the hospital as a 'visiting' or 'courtesy' doctor. Thus, they remain in 'staff position' and do not enter into the 'line position'.

1.6.4 Goals of Operations Manager

In a hospital, an operations manager is responsible for planning, organising, directing, and controlling the activities that are involved in converting inputs into the desired output. The manager also needs to procure resources at a minimum cost and make the best utilisation of resources. The operations manager is responsible for motivating his/her team members and for bringing out the best in them. Apart from this, the following are some of the main goals of an operations manager:

- Producing services as per the desired specifications
- Acquiring resources at minimum prices
- Selecting the best location for facilities
- Purchasing efficient equipment
- Establishing work standards
- Selecting efficient operation techniques
- Planning capacities of hospital and equipment
- Planning and controlling activities
- Managing and controlling inventory
- Measuring and monitoring activities
- Maintaining industrial relations with other healthcare organisations
- Ensuring the health and safety of employees
- Planning budget and other financial resources
- Participating in strategic decision making
- Automating processes
- Enhancing research and development efforts
- Ensuring timely delivery of services
- Abiding by environmental rules and regulations
- Maintaining long-term relationships with suppliers and other third parties

Apart from the achieving the goals mentioned above, the operations manager is also responsible for decision making in a hospital. The decisions taken by an operations manager are explained as follows:

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- **Control decisions:** These involve decisions related to total quality control, planning, and maintenance management.
- **Strategic decisions:** Strategic decisions involve decisions related to planning, technology, facility layout, and allocation of resources.
- **Operational decisions:** These decisions involve those related to inventory systems, materials management, and decisions related to hospital floor planning.

Self-Assessment Questions

- 14. ______ is a process whereby resources or inputs are transformed into intangible services such as banks, healthcare, railways, airlines etc.
- 15. Hospitals operations management ensures that the right services are delivered in the right quantity, at the right place. (True/False)
- 16. ______ should avoid waste in equipment, supplies, ideas, and energy.
- 17. The medical staff of a hospital usually consists of highly trained and motivated professional groups including a panel of doctors and surgeons. (True/False)
- **18.** ______ decisions involve decisions related to planning, technology, facility layout, and allocation of resources.
 - a. Control decisions
 - b. Operational decisions
 - c. Strategic decisions
 - d. Functional decisions

Activity

Visit any nearby hospital. Find out the key functions of the operations management. Compile a report on your findings.

1.7 Trends in Hospital Operations Management

As discussed earlier, hospital operations management is all about producing health care services as per the needs and expectations of patients. With the recent developments in the business environment and technologies, there are a number of new trends that have emerged in the field of hospital operations management. The following are some of the recent trends in hospital operations management:

- Globalisation: It involves the integration of different economies, societies, and cultures through cross-border communication and trades. The reduction in trade barriers and ever increasing competition has encouraged health care organisations to enter into a global business. Globalisation has provided these organisations enormous opportunities of growth and expansion in the international market.
- Total quality management (TQM): It aims at minimising errors occurred at the time of producing goods and providing services. The concept of TQM focuses on the strengths, systems, work culture, policies, and the cost effectiveness of an organisation so as to deliver quality products and services. Moreover, it is concerned with the active

participation of all employees in continuous improvement in the quality of health care services.

- Integrated health care system (IHS): Integrated healthcare is a worldwide trend. The transition from simple home-based treatment centres to Integrated Healthcare System (IHS) was a difficult change for the health care industry. As a response to fragmented health care delivery services, IHS is a coordinated and integrated form of health care. IHSs work as a network of health care organisations (typically with shared governance) that provide a range of services to a defined population. The concept of integrated health systems started in the United States when many successful community hospitals evolved into integrated healthcare organisations (IHCOs) that shared several common characteristics. For example, the United States Department of Veterans Affairs is the largest integrated healthcare system in the U.S. Kaiser Permanente and the Mayo Clinic are the two other examples of large private integrated healthcare systems in US. Similarly, Fortis Hospital and Apollo Hospitals Group are a few examples that have successfully implemented an integrated health care delivery system in India.
- **Outsourcing:** It is the latest trend that helps hospitals focus on clinical care, rather than other essential, yet secondary functions. These include outsourcing housekeeping, security, information technology, materials management, etc. A hospital needs to analyse which services should be outsourced and are kept in-house in terms of costs and effective time management.
- Customer relationship management (CRM): It refers to a business strategy that enables hospitals to better serve the needs of their patients by providing them high quality services. CRM also aims to improve the quality of services and achieves a high level of patient satisfaction, which results in a significant increase in brand loyalty.
- Business process re-engineering (BPR): It is a practice that involves re-designing the workflow pattern and processes of an organisation. It helps an organisation in improving its efficiency of an organisation by identifying the loopholes in the existing processes.
- **Standardisation:** It is another trend that helps hospitals in cutting down on costs. It helps a hospital to maintain consistent performance throughout operations. Standardisation also helps in setting common standards for staff and operational processes. This enables departments to follow a similar rule and reduce the chances of variations.
- **Medical tourism:** It is another emerging trend where people of different countries travel across the globe to find the best possible treatment. Medical supplies, pharmacy companies, and equipment are procured from different parts of the world to provide the best medical facility to the patients.

🔁 Self-Assessment Questions

- **19.** ______involves the integration of different economies, societies, and cultures through cross-border communication and trades.
- 20. TQM focuses on the strengths, systems, work culture, policies, and the cost effectiveness of an organisation so as to deliver quality products and services. (True/False)
- **21.** _____helps a hospital to maintain consistent performance throughout operations by following a similar rule and reducing the chances of variations.

Notes

I.8 Summary

- Initially, hospitals were recognised as a house of mercy, refuge, and dying. Space was provided to victims for physical protection and spiritual comfort.
- By the 18th century, hospitals became a house of cure, where more attention was paid to medical and surgical treatments.
- Hospitals and other allied fields became more streamlined and professional in the mid-19th century that turned hospitals into complex organisations.
- Today, based on various kinds of treatments and facilities, hospitals can be classified into
 - General hospitals
 - Specialised hospitals
 - Teaching hospitals
 - Clinics and dispensaries
- As a part of the health care industry (medical industry), hospitals denote to facilities that offers goods and services for the treatment of patients with preventive, curative, rehabilitative, and palliative care
- In the First Curve, the healthcare industry is rooted in the 'craft' and its growth reflects the initial stages of industrial design.
- Today, many healthcare delivery systems have begun focusing on the Second Curve of development which consists of a more evolved set of systems, hospitals, and process designs that are aimed at the increasing demands of funders, service providers and customers.
- The conditions and factors that are considered by hospitals as an organisation are:
 - External environment
 - Organisational assessment/ internal environment
 - Human resource
 - Political process
 - Five major components of an organisation that are applicable on hospitals are:
 - Task
 - People
 - Structure
 - Technology
 - Environment
- Hospitals are broadly categorised into intramural functions and extramural functions.
- Hospital operations management can be defined as a process of designing, planning, executing, and improving operations and systems to create and deliver health care services efficiently.
- The key functions of hospital operations management include:
 - Planning

CHAPTER 1 Healthcare Operations Management

Notes

- Organising
- Controlling
- Hospital operations management is needed for:
 - Producing the right kind of health care services
 - Timeliness
 - Efficient operations
 - Risk appreciation
 - Achieving steadily high quality
- Some of the recent trends in hospital operations management are:
 - \bigcirc Globalisation
 - Total quality management
 - Integrated healthcare system
 - Outsourcing
 - Customer relationship management
 - Business process re-engineering
 - Standardisation
 - Medical tourism

1.9 Glossary

- Accreditation: It refers to the quality assurance process that evaluates organisations, agencies and educational programs.
- **Brand loyalty:** It refers to the extent to which a customer is trustful to a particular brand.
- **Cost-quality continuum:** It is the process of stabilising a balance between maintaining cost as well as quality continuously.
- Facility layout: It refers to the arrangement of facilities for carrying out the production process
- Integrated health care system: It works as a network of health care organisations (typically with shared governance) that provide or coordinate a range of services to a defined population.
- Leadership: It can be defined as an ability to influence behaviour of people in order to reach specific goals within an organisation.
- Operational excellence: It is a philosophy where applications of various systems, principles and tools help one improve the behaviour and performance of an organisation.
- **Outsourcing:** It is a process of contracting out a service to a third-party by a business as it helps in financial savings with lower labour rates.

NOTES

1.10 Terminal Questions

- 1. What are the various categories into which hospitals can be categorised?
- 2. What are the major assumptions and beliefs that characterise the First Curve?
- **3.** Discuss the various conditions and factors that are considered by hospitals as an organisation.
- 4. Explain the concept of hospital operations management.
- 5. Explain the concept of integrated healthcare system.

1.11	Answers
Q.	Self-Assessment Questions
1.	True
2.	b. Specialised hospitals
3.	Teaching
4.	a. "First Curve"
5.	False
6.	True
7.	Central structures, processes and support systems
8.	Organisation
9.	False
10.	c. Political process
11.	Task, people, structure, technology, and environment
12.	Intramural
13.	Extramural
14.	Operations management
15.	True
16.	Health care centres
17.	True
18.	c. Strategic decisions
19.	Globalisation
20.	True
21.	Standardisation
Q.	Terminal Questions
1.	Based on various kinds of treatments and facilities, hospitals can be classified into general hospitals, specialised hospitals, teaching hospitals, and clinics and dispensaries. Refer to sub-section 1.2.1 Classification of Hospitals .

2.	The current healthcare systems, structures, processes and culture are on the "First Curve" paradigm of the healthcare sector that is still rooted in the craft stage of system growth. Refer to section 1.3 Hospital as a System .
3.	The conditions and factors that are considered by hospitals as an organisation are external environment, organisational assessment/ internal environment, human resource, and political process. Refer to section 1.4 Hospital as an Organisation .
4.	Hospital operations management can be defined as a process of designing, planning, executing, and improving operations and systems to create and deliver health care services efficiently. Refer to section 1.6 Concept of Hospital Operations Management .
5.	Integrated healthcare systems (IHS) work as a network of healthcare organisations to provide a range of services to a defined population. Refer to section 1.7 Trends in Hospital Operations Management .

1.12 Case Study: Continuous Improvement in Hospital Operations Management

◆ The Situation: In a US-based pharmaceutical company, the ingredients of each of the formulations are required to be mixed in large industrial mixers. However, the industrial mixer is required to be cleaned after the end of one batch of drug production and before the start of another batch of the drug. In addition, the company was also subject to the regulations of the Food and Drug Administration. In the company, the operators took between 3 to 4 hours (that means a total of 9 to 12 hours). Naturally, the cleaning process did not add any value to the company as it was not adding any value to products.

Therefore, the company was striving to reduce the time required in the cleaning process.



- The Approach: The company improvised its operations management to bring continuous improvement in the cleaning process and substantially reduce the requirements of time. An implementation team, consisting of five employees, was built. The goal of the team was to study the cleaning process for five weeks in order to reduce the cleaning time to 90 minutes from the present requirements of 3-4 hours.
- ◆ The results: In the first week, the cleaning time was reduced to 105 minutes. In addition, the team also identified additional scope of improvement in the process. As a result, at the end of the fourth week, the cleaning time was reduced to 95 minutes, which was very near to the set objective. Within 90 days, the company achieved the target of reducing the cleaning time to 90 minutes.

Notes

Discussion Questions

1. On the basis of the case, discuss the benefits of a sound hospital operations management in the health care industry.

(**Hint:** Hospital operations management helps in delivering the right kind of health care services to patient, effectively executing processes, and achieving steadily high quality.)

2. How would you evaluate the approach of continuous improvement in hospital operations management?

(**Hint:** Today, hospital operations management relies on 'continuous quality improvement' to improve performance by eliminating poor quality services; rather than trying to fix the outcomes of poor service delivery.)

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CHAPTER



Medical Record Documentation

Struc	cture	
2.1	Introduction	
	Learning Objectives	
2.2	Role of Front Office in Medical Record Documentation	
2.3	Patient Identification and Admission	
2.4	Billing	
2.5	Medical Record Maintenance	
2.6	Record Amendments and Corrections	
2.7	Discharge Documentation	
2.8	Documentation of Death	
2.9	Bio Medical Equipment Maintenance and Management	
2.10	Summary	
2.11	Glossary	
2.12	Terminal Questions	
2.13	Answers	
2.14	Case Study: A Case of Poor Medical Record Documentation	
2.15	References and Suggested Readings	
Notes

Learning Objectives

After completing this chapter, you will be able to:

- Discuss the role of front office in medical record documentation
- **D** Explain the concept and procedure of patient identification and admission
- Define the billing process
- **D** Explain the significance of medical record maintenance
- Discuss the need of record amendments and corrections
- **D** Explain the significance of discharge documentation
- **D** Explain the significance of death documentation
- Describe the concept of bio-medical equipment maintenance and management

2.1 Introduction

Medical documentation refers to a specific record that provides all the health related information about a specific patient. Therefore, medical record documentation can be defined as written evidence from the authorised person of hospital staff regarding the healthcare services provided to the patient for a particular disease/illness/injury. It also includes the patient's response to these healthcare services in terms of improvement rate in the health condition of the patient. Medical record documents are a very important and irreplaceable piece of evidence related to the patient's medical history, treatment and condition.

Medical documents also help healthcare professionals to get all the information needed related to the patient's past and present health condition. Interdisciplinary caregivers require these medical documents to plan the line of treatment. One should be very careful regarding all the information they write in a medical document. Any incorrect information or skipping of any details, can lead to serious injury or even death of the patient. Today, patients and their relatives are aware of their legal rights. Any lapse or negligence from the hospital's side can lead to litigation.

This chapter begins by explaining the role of front office in medical record documentation. The chapter also explains various aspects related to patient identification and admission. You will also study the significance of the billing process in hospitals and how hospitals maintain their medical records. The chapter further elaborates on the instances where the hospital needs to amend or make corrections in the patient's medical records. Next, you will study about the two major documentation works of hospitals that are, preparing discharge documentation and death documentation. Towards the end, the chapter explains the concept of bio medical equipment maintenance and management.

2.2 Role of Front Office in Medical Record Documentation

A medical record contains all the information related to the patient's health and the kind of treatment provided to him/her. It consists of the details of the patient's visits to the hospital for treatment or receiving opinions. The front office staff or outpatient department (OPD) has an important role in medical record documentation. The employees working in such departments ask all the required information from patients and document it correctly. This record further assists physicians in curing patients accordingly. Thus, the role of front office in medical record documentation is very crucial. The important functions of front office related to medical documentation include:

- The front office staff plans, develops, and directs a medical record system that includes original clinical records, primary and secondary records as well as other indexes.
- They assign a new patient a unique identification number according to the hospital system.
- They fill forms with accurate information related to the patient name, age, date of birth, address, contact number, etc.
- They assign/direct patients to the correct physician and maintain related records.
- Front office staff maintains a patient index related to every patient who has visited the hospital. In this way, they may help patients in retrieving their previous records (in case the patient has lost it) and updating them as required.
- In some hospitals, the front office maintains and documents information related to medical claim, denied claims, unprocessed statements, etc. They also maintain insurance and medical policy documents of patients. It is a very important task as any discrepancy in maintaining these records may lead to interference in patient care or delay in medical bill payment.

2.2.1 Authorship Validation and Medical Record Documentation

The security process of identifying a health care service provider, who documents medical records, is called authorship. It authorises an individual to access the system. In hospitals where documentation is done under the paper-based system, authorship becomes very important as it assigns a responsibility to the health care service provider for entries he/she creates, modifies, or views. Authorship includes an entry in writing or by dictation.

Validation signifies to the act of verifying the entry made in the records in terms of accuracy and authorship. Under a paper-based system, validation includes a written signature or a computer generated signature code.

Authorship and validation work as a safety measure without which records could reflect an inaccurate picture of the patient's condition, either at the time of admission or during the period of treatment. Hospitals follow various rules and regulations on documentation principles that address authorship validation process in a paper-based system. They must understand the necessity of authorship validation of all data to ensure that only patientspecific data is recorded, while all other irrelevant data is removed.

🔁 Self-Assessment Questions

- 1. A ______ contains all the information related to the patient's health and the kind of treatment provided to him/her.
- 2. What is the role of front office in medical record documentation?
- **3.** The security process of identifying a health care service provider, who documents medical records, is called ______.
- 4. ______ signifies to the act of verifying the entry made in the records in terms of accuracy and authorship.

Notes

Notes

2.3 Patient Identification and Admission

In the health care industry, correct identification of patient's problems is one of the major and serious issues. Inaccurate identification may often lead to wrong treatment given to the wrong person, medication errors, diagnostic testing errors, and even surgical errors.

Though it is mandatory to all health institutes and hospitals to follow standardised health care guidelines given by, The World Health Organisation; incorrect patient identification is still a big problem concerning hospitals worldwide. The main objective behind following standardised health care guidelines is to ensure zero prevalence of near misses and patient safety incidents that are related to incorrect patient identification.

Today, many hospitals have their own patient identification policy based on international standards. Some standard guidelines related to patient identification and admission are explained in the next sections.

2.3.1 Identification Policy on Admission

- All patients visiting the hospital should be correctly identified.
- Details of patient name, surname, and age should be taken directly from the patient/ their relatives/legal guardian/ custodian (in case of children).
- Referral letters/patient's belongings/friends should be used/communicated for identification only in case the patient is unable to communicate and is unaccompanied.
- Children who are admitted via emergency care services and are unaccompanied by their guardians, should be treated as required. However, they should not be formally admitted or taken in for any non-urgent procedure. The hospital staff should wait till legal custodian identifies the child and gives their consent. Only in case of emergency, the staff should give the child a pseudonym before bringing him/her to the operating room.
- While admitting the patient in the ward, the staff should check and match all the identification details of the patient as obtained by the front office.
- All in-ward patients in the hospital should have an identity tag or specific wrist band or ankle band for identification.
- The necessary information on the identity band should include:
 - The patient's surname and maiden name
 - Date of birth
 - Hospital name/number
 - Ward number
 - Admitting doctor or medical officer's name
- In case of small children or new-born, the information should include:
 - Name
 - Date of Birth
 - Hospital name/number
- The staff should check all the identity details of the patient before start providing any kind of treatment.

- A red band should be securely fixed on the ankle or wrist of the patient in case of he/ she has any known allergies.
- In case, two patients with the same surname/family name are admitted in the same room
 or ward, a cautionary card must be stating 'PATIENT WITH THE SAME NAME IN
 WARD' and their given names, should be placed with each patient's health care record.
- If the patient's identity is not confirmed (in case, the patient is unconscious, intoxicated, or having communication issues), they should be registered as 'unknown male' or 'unknown female.'

2.3.2 Types of Hospital Admissions

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A patient is admitted to the hospital in various ways. The patient may be admitted to the emergency department as in case of trauma, accident or in some other kind of emergency or he/she can be admitted as per the prior appointment with the doctor and kept in the hospital for further treatment. Based on these two situations, admission in hospitals can be categorised into:

Scheduled admission: The patient is admitted on a planned basis to the hospital. The doctor informs patients and their relatives regarding the admission for a test, special procedure, surgery or observation. The admission should be arranged at least 24 hours before the patient actually gets admitted.

Following is an example of scheduled admission:

"Alex was seen by his physician on August 10th, and upon examination at 11.00 pm, it was decided he needed an angioplasty. He was scheduled for an angioplasty at 3.00 pm after 2 days, that is, August 12th. He was admitted at 11.00 am on 11th March for the scheduled angioplasty on the 12th."

 Unscheduled admission: Such kind of admission is not pre-planned and the hospital admits the patient in some emergency situation.

Following is an example of unscheduled admission:

"Mark was suffering from severe acute abdominal pain and was brought to the hospital. After initial assessment and tests, it was determined he is suffering from acute appendicitis. An emergency operation is scheduled and he is admitted to inward patient department care."

Self-Assessment Questions

- 5. In the health care industry, what is the significance of correct identification of patient's problems?
- 6. Children who are admitted via emergency care services and are unaccompanied by their guardians, should not be formally admitted or taken in for any non-urgent procedure. (True/False)
- 7. What are the two types of hospital admissions?

Activity

Compare the patient admission policy of a government hospital with that of a private one. Record your findings.

Notes

2.4 Billing

In order for hospitals to be able to retain their financial stability, hospitals need to ensure that to the billing process they use needs to be as efficient as possible. As part of the billing process, the hospital collects charges from patients and third-party payers, reports patient transactions, and follows up on accounts that are still outstanding. Under the billing process, it is ensured that patients, insurance companies and government programmes are reimbursed for the services and commodities that the hospital has supplied to them.

As soon as a patient arrives in a hospital for the purpose of receiving diagnosis and treatment for any kind of accident, illness, or disease, the billing process gets underway. If a patient wants to use the services of the health insurance policy owned by him/her, the insurance information is gathered and entered into the patient identity record system. Additionally, the patient's account is updated to include the patient care service and supplies provided to the patient during his/her stay in the hospital. All of the charges are computed and prepared for billing at the time when the patient is discharged from the hospital. Since this is the case, the billing process encompasses all of the functions that assist hospitals in collecting charges from patients and third party payers in order to earn payment.

The billing process also involves the preparation and submission of insurance claim forms and their settlements and disputes procedures. It also help hospital staff to prepare patient bill receipts and update any patient transactions carried out during the hospital stay. This ultimately helps in payments and adjustments.





Fig. 2.1: Hospital Billing Process (Courtesy: Sandra Giangreco) (Source: http://www.coursewareobjects.com/objects/evolve/E2/book_pages/ferenc/pdfs/ch04.pdf)

Today, automation in the billing process has helped in centralising the database of all concerned departments and providing vital information about patients in the hospital. Let us now discuss few terminologies, used in the billing process of any hospital:

- Patient statement: It is a detailed bill that contains dates or time period on/during which the patient availed health care services from the hospital, description of the charges, payments made, and the balance due. This record is printed and handed over to patients and/or mailed in some cases. The patient statement is often given as a reminder to outstanding payments.
- Third-party payer transactions: There are various third-party payers like insurance agencies that send a remittance advice (RA) to hospitals. All the information related to

Notes

the charges submitted by the hospital and an explanation related to the processing of the claims is given to the hospital. This information includes:

- Denial or rejection of the claim with reason
- Covered and non-covered charges related to the payment of the claim
- Any additional information required

In case of corporate billing, the statements are mailed or sent to the corporate office. In some cases, the patient pays the bill and medical expenses are reimbursed by the organisations for which they work. After receiving the details from the third-party payers, the billing department:

- Posts the third-party payments to the patient's account.
- Makes a contractual adjustment as and when required.
- Returns balance (if any) to the patient or to the secondary or tertiary payer like the corporate office.
- Patient payments and bill: The entire outstanding amount paid by the patient or third-party payers is posted to the patient's account. A detailed statement along with the bill paid is given to the patient after successful payment of all due charges. In case of VIP patients, an express billing is carried out and the patient is discharged. The payment in such cases is often realised after the patient leaves the hospital.

😢 Self-Assessment Questions

- 8. The _____process includes collecting charges from third party payers and patients, posting patient transactions, and following up outstanding accounts.
- 9. Define patient statement.
- 10. In case of VIP patients, an express billing is carried out and the payment in such cases is often realised after the patient leaves the hospital. (True/False)

2.5 Medical Record Maintenance

Hospitals have to be very accurate in recording all information related to patients as it is a licensing and certification prerequisite. Traditionally, all matters related to patients were manually compiled and maintained by hospitals. With advanced technology, today most of the hospitals have a data storage facility. This contains all the developments related to personal health records (PHR) that are maintained by patients themselves on a third-party website.

Medical records are considered to be sensitive personal information. These records are covered by many issues such as legal and ethical aspects. Thus, their maintenance, third-party access, and proper storage and disposal are of utmost priority for hospitals. Though medical records are stored by hospitals, they are considered to be the property of patients. The patients can request for copies of their medical records whenever needed.

2.5.1 Brief Sheet

A brief sheet is often referred to as an admission note that contains patient's status, reasons why the patient is admitted to the hospital or other facility as well as the initial instructions related to patient care.

NOTES

The purpose of a brief sheet is to explain why a patient is admitted to the hospital or to give account of patient's disease, illness, or condition. The health care professionals use this basic information related to a patient's health to give initial treatment instructions. These brief sheets consist of:

- Extra notes related to patient health and care
- Procedure notes
- Operative notes
- Progress notes
- Delivery notes
- Postpartum notes
- Discharge notes
- Chief complaint (CC)
- ◆ History of present illness (HPI)
- Review of systems (ROS)
- Allergies
- Medications
- Past medical history
- Family history (FH)
- Social history (SH)
- Physical examination
- Labs and diagnostic reports
- ◆ Assessment and plan (A&P)

2.5.2 Medical History Form

A medical history form is filled before or at the time of patient's admission. The information filled by patients in the medical history form is strictly confidential. This information helps health care professionals to evaluate the health of patients. One needs to carefully fill the medical history form without missing out on any vital detail as the medical treatment given to the patient is based on the information filled in the form. The medical history form also helps doctors know if the patient is suffering from any chronic medical problem or not before starting new medication. This is necessary to ensure treatment success.

2.5.3 Physical Examination

The physical/clinical examination or check-up is a process that helps medical professionals to examine the patient for any signs of illness, disease, or trauma. Along with the medical history, the physical examination helps the doctor to diagnose the physical condition of patients and plan a treatment accordingly. The observations that are noted during physical examination also form a part of the medical record.

The physical examination includes:

- Checking vital signs such as temperature, blood pressure, pulse and respiration rate
- Checking the vision, hearing, touch and even smell to determine a health problem.
- The doctor has to follow the four basis of physical examination, that is, inspection, palpation, percussion and auscultation.

2.5.4 Laboratory Reports

Laboratory reports are also a kind of personal information records. Before actually starting the treatment, medical professionals recommend some tests such as X-rays, EKG's, ECG, MRI, CT scans, blood test, stool test, etc. to patients to know the exact problem that is incurring in the patient's body. These tests are also required during the treatment process to know the progress in the patient's condition and identify whether the treatment is going in the right direction.

Such tests are usually done in hospital's laboratories or pathology centres where the lab physician/ pathologist after conducting the tests, generates a laboratory report, mentioning all the details of patient's illness. The laboratory reports are also used for psychological assessment, where the findings related to the mental health of the patient, are generated. Laboratory tests are done only on doctor's order or by hospital's permission.

2.5.5 Statistics

Hospital statistics is information related to various aspects of a hospital, such as length of stay of each and every patient, turnover interval, discharges as well as death per available bed. Statistics help hospital administration to analyse the efficiency and performance of a hospital. The increase in 'efficiency' means that the hospital should maintain the current level of service. Any fall requires the hospital administration to review the hospital's existing system and services provided to patients.

2.5.6 Other Records

Items that are kept with medical records are included in other records. This includes:

- Digital images of the patient,
- Flow sheets from operation theatre or intensive care units,
- Informed consent forms,
- EKG tracings,
- Outputs from medical devices like pacemakers
- Chemotherapy protocols,
- Important information related to patient illness and treatment

2.5.7 Hospital Libraries

A hospital library can be defined as a place that provides Knowledge-based Information (KBI) to the hospital staff and administration as and when required for developing systems and services for patient care. The hospital library may contain books, journals, magazines, articles, online information, etc. that are specifically related to medical science and technology.

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The hospital library usually has a medical librarian who reports to the hospital management. The hospital library should contain:

- Journals, texts, documents in print or electronic format
- Guideline, consensus development statements
- Research studies
- Quality-filtered Internet references

A hospital library is an important part of the hospital. It helps and supports health care professionals in:

- Patient care
- Improving performance and strategic decision making
- Patient education
- Research initiatives
- Teaching medical students
- Upgrading the hospital staff's knowledge with new trends prevailing in the medical field

Self-Assessment Questions

- 11. A _______ is an admission note that contains patient's status, reasons why the patient is admitted to the hospital or other facility as well as the initial instructions related to patient care.
- 12. The medical history form helps doctors know if the patient is suffering from any chronic medical problem or not before starting new medication. (True/False)
- 13. What do you understand by the hospital statistics?
- 14. A ______can be defined as a place that provides Knowledge-based Information (KBI) to the hospital staff and administration as and when required for developing systems and services for patient care.

2.6 Record Amendments and Corrections

There are various reasons that make hospital staff to make amendments and corrections in the patient's record. For example, some amendments and corrections become inevitable as there are record entry errors. However, in some cases, patients may also request that information contained in their patient record needs to be updated.

There are certain guidelines to be followed for medical record amendments and corrections. These include:

- A senior authority of a hospital should review errors. Obvious minute errors such as spelling mistakes do not require intervention by senior authority. However, in case of big errors, the senior authority should determine whether the correction complies with the institution's guidelines for record amendments.
- Usually, the person who made the incorrect record entry should correct it. For example, a nurse cannot amend a physician's medication orders unless directed to do so by a physician. If that is not possible, the hospital administration should make only those changes that are within the scope of administration as defined by state licensing and certification laws.

Notes

- The person in charge of correcting errors should strike a single line through a mistake or error and make the required corrections.
- When making corrections, the person should ensure that corrections are made in a chronological order. One should put time and date near the correction.
- While making a correction, a person should never use fluid/whitener. He/she should take care that the error is not completely crossed out.
- While making a correction, the person should never write a new entry over the error and the sides of the page or bottom of the page. If the space is less, he/she should start with a new page and label it as 'addendum'.
- While making a correction, the person should put the current date and give the reference to the original entry on the new page.
- In case dictation services are utilised, the person making changes should proofread the document before signing and dating it.

Self-Assessment Questions

- 15. A senior authority of a hospital should review errors in the patient's record. (True/False)
- 16. What among these statements is not correct:
 - a. When making corrections, the person should ensure that corrections are made in a chronological order. One should put time and date near the correction.
 - b. The person in charge of correcting errors should strike double line through a mistake or error and make the required corrections.
 - c. While making a correction, a person should never use fluid/whitener. He/she should take care that the error is not completely crossed out.
 - d. While making a correction, the person should put the current date and give the reference to the original entry on the new page.

2.7 Discharge Documentation

Hospital discharge summary documents are an important part of a medical record. These discharge summaries contain information related to patient care during their stay in the hospital. The discharge summary is given to the patient to carry along when they visit the hospital for further care.

It serves as a vital tool for providing the clinical information to the patient by the doctor. The discharge documentations should contain:

- Reasons for admitting patients
- Significant diagnosis
- Procedures carried out and treatment provided
- Condition of patient on discharge
- Any instructions to be followed by the patient and his/her relatives, if required
- Signature of the attending physician

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There is no specific or clear way to standardise a hospital discharge documents. Every doctor follows his/her own way to file a discharge summary. However, hospitals are now trying to follow a set format of discharge summaries that covers all the required information related to the patient.

🔁 Self-Assessment Questions

- 17. What is a hospital discharge summary document?
- The discharge documentations need not to contain the reasons for admitting patients, but only the condition of patient on discharge. (True/False)

2.8 Documentation of Death

Documentation of death includes the time of death; the events leading to death; consent for autopsy from concerned authority and family members; and information to determine whether the case is within the jurisdiction of the state medical examiner. Documentation of death is an important part of medical record documentation. It provides clues related to the quality of medical care given to patients and gives credibility to various physicians involved in the treatment of the patient. This vital document of death contains:

- The physicians' progress notes to give a narrative account of the hours or days of the patient (who is leading to death) in the hospital. In simple words, it is the doctor's explanation as to why the patient died.
- Nursing notes mentioned in the nursing progress notes or any applicable nursing documentation will help support or contradict in some cases, the physician's point of view on the cause of death.
- The death certificate explains the official cause of death. It is kept in the hospital record for accepting similar cases in future that may result in patient's death. The death certificate also explains legal authorities that whether the death was 'natural' or requires criminal investigation.
- Post-mortem reports that are usually conducted in the case of unnatural death, such as suicide, accident, or murder.

2.8.1 Death in Hospital

There is a set procedure to be followed in case of death in a hospital. A set of legal requirements and forms are required to be filled for registering a death. When death occurs in a hospital:

- The hospital staff will inform the next of kin, relatives or friends accompanying the patient regarding the news.
- The body will be sent to the hospital mortuary, till the relatives make arrangements to take the body away.
- The belongings of the patient should be handed over to the relatives.
- The attending physician will issue a death certificate.
- The hospital will send the death certificate details to the registrar of births, deaths and marriages.
- In some cases, the hospital may request a post-mortem examination, if they need to know more about the cause of death.

2.8.2 Brought-in Dead

Brought-in dead/brought dead/death on arrival are the terms used for patients who are clinically dead when they are bought to the hospital.

The medical professionals have to perform cardiopulmonary resuscitation (CPR) to a pulseless patient. CPR should be skipped only if the injuries point towards death. This includes multiple severed body lacerations, decapitation or severe injuries to chest that do not allow the administration of CPR.

The attending doctor has to record the estimated time and cause of death based on the physiological signs and first-responder testimony. Usually, a post-mortem and toxicology report is ordered in such cases. In some cases, the police needs to be notified regarding dead on arrival. The hospital has to provide a proper report about the procedural steps taken to resuscitate the patient.

2.8.3 Certification of Death

Certification of death or death certificate is a document that is issued by the concerned doctor who provided care and attention to the patient in his/her last minutes. Death certificate explains the reasons for the patient's deteriorating health conditions that led him/her to death. It certifies the deceased state of the person and declares the date, time, location, and cause for the person's death.

The death certificate should be issued by a registered medical practitioner who has been a medical consultant of the deceased, while he/she was alive. However, it is necessary that the practitioner has attended the deceased within past 14 days of death. The practitioner should also ensure that the cause of death is based on medical findings and not superfluous factors.

🔁 Self-Assessment Questions

- **19.** The ______ explains the official cause of death.
- **20.** Post-mortem reports are usually conducted in the case of unnatural death, such as suicide, accident, or murder. (True/False)
- Brought-in dead/brought dead/death on arrival are the terms used for patients who are _____.
- **22.** The death certificate should be issued by a ______ who has been a medical consultant of the deceased, while he/she was alive.

2.9 Biomedical Equipment Maintenance and Management

The advancement in medical science and engineering has led to the availability of more than 10,000 types of medical devices. Each hospital depending on its core services and specialisation uses these medical devices to impart medical care to its patients. Some of the core medial equipment's that are present in almost all hospitals are as follows:

- X-ray machines
- Ultrasound sonographer machine

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- Gastroscopy (with halogen light source)
- Colonoscopy (With halogen light source)
- CT scan machines
- MRI machines
- PET scan machines
- Defibrillator
- Pulsoximeter
- Laparoscopy system with instrumentation for general surgery
- ♦ EEG machine
- ◆ Nebuliser
- Mammography
- Coronarography /Angiography system

Theses expensive biomedical equipment incur huge maintenance and management cost. Therefore, the hospitals need to plan and organise an equipment maintenance and management system for taking care of these equipment. Biomedical equipment management is the primary function of managing and maintaining medical devices that are used in hospitals.

The standard operating policies and procedures related to biomedical equipment management includes selection, planning and acquisition of medical devices, spares and maintenance, contract term, after sales services, onsite maintenance after calling in orders and fulfilment of quotations and tenders.

Regular maintenance ensures longer life of hospital equipment. It also ensures safety of patients as well as the staff who operates these equipment on a daily basis. Biomedical equipment maintenance and management is important as:

- The medical equipment usually operate at optimum levels at all times
- Deliver the maximum value to the facility involved
- Reduce the overall service cost
- Increases the equipment uptime and utilisation
- Ensures that the hospital fulfils its equipment service agreements on time

Extra care is given to critical care equipment like ventilators, OT equipment and radiology equipment to ensure that they do not fail at a critical point of patient care. Management, maintenance, and timely repair of medical equipment reduce the risk of infections and wrong results, especially in the laboratory and pharmacy department.

🔁 Self-Assessment Questions

- **23.** _______ is the primary function of managing and maintaining medical devices that are used in hospitals.
- **24.** What are the standard operating policies and procedures related to biomedical equipment management?

Activity

Visit any nearby hospital. Find out how biomedical equipment is maintained and managed.

2.10 Summary

- A medical record contains all the information related to the patient's health and the kind of treatment provided to him/her.
- The security process of identifying the healthcare service provider, who documents the medical records, is called authorship.
- Validation signifies to the act of verifying the entry made in the records in terms of accuracy and authorship.
- In the health care industry, correct identification of patient's problems is one of the major and serious issues as inaccurate identification may often lead to wrong treatment given to the wrong person, medication errors, diagnostic testing errors and surgical errors.
- The billing process of any hospital includes collecting charges from third party payers and patients, posting patient transactions, and following up outstanding accounts.
- A brief sheet is often referred to as an admission note that contains patient's status, reasons why the patient is admitted to the hospital or other facility as well as the initial instructions related to the patient's care.
- The physical /clinical examination or check-up is the process which helps the medical professional to examine the patient for any signs of illness, disease or trauma.
- Hospital statics is information related to the various aspects of a hospital, such as length of stay of each and every patient, turnover interval, discharges as well as death per available bed.
- A hospital library can be defined as a place that provides Knowledge-based Information (KBI) to the hospital staff and administration as and when required for developing systems and services for patient care.
- Hospital discharge summary documents contain information related to the patient's care during their stay in the hospital.
- Documentation of death includes the time of death; the events leading to death; consent for autopsy from concerned authority and family members; and information to determine whether the case is within the jurisdiction of the state medical examiner.
- Biomedical equipment management is the primary function of managing and maintaining medical devices that are used in hospitals.

2.11 Glossary

- Authorship validation: It is a process where a publication is awarded authorship based on the ethical review requirements.
- Bought-in Dead (BID): A patient who is declared dead after coming to the hospital.
- Identification bands: These bands are fixed securely around the patients' wrists/ ankles and used for identification by the hospital staff.
- Scheduled admission: It is a planned admission of patients in a hospital.

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2.12 Terminal Questions

- 1. Explain the concept of medical record.
- 2. Discuss the concept of authorship validation.
- 3. What are the various types of hospital admissions?
- 4. Discuss the elements involved in the billing process of any hospital.
- 5. Write a short note on brief sheet and hospital library.
- 6. Discuss the significance of discharge documentation.
- 7. Explain the concept of biomedical equipment management.

2.13 Answers

Q.	Self-Assessment Questions
1.	Medical record
2.	The employees of front office ask all the required information from patients and document it correctly.
3.	Authorship
4.	Validation
5.	Inaccurate identification may often lead to wrong treatment given to the wrong person, medication errors, diagnostic testing errors, and even surgical errors.
6.	True
7.	The two types of hospital admissions are Scheduled admission and Unscheduled admission.
8.	Billing
9.	Patient statement is a detailed bill that contains dates or time period on/during which the patient availed health care services from the hospital, description of the charges, payments made, and the balance due.
10.	True
11.	Brief sheet
12.	True
13.	Hospital statistics is information related to various aspects of a hospital, such as length of stay of each and every patient, turnover interval, discharges as well as death per available bed.
14.	Hospital library
15.	True
16.	b. The person in charge of correcting errors should strike double line through a mistake or error and make the required corrections.

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CHAPTER 2 \blacksquare Medical Record Documentation

Notes	17	
	17.	Hospital discharge summary documents contain information related to patient care during their stay in the hospital.
	18.	False
	19.	Death certificate
	20.	True
	21.	Clinically dead when they are bought to the hospital
	22.	Registered medical practitioner
	23.	Biomedical equipment management
	24.	The standard operating policies and procedures related to biomedical equipment management includes selection, planning and acquisition of medical devices, spares and maintenance, contract term, after sales services, onsite maintenance after calling in orders and fulfilment of quotations and tenders.
	Q.	Terminal Questions
	1.	A medical record contains all the information related to the patient's health and the kind of treatment provided to him/her. Refer to section 2.2 Role of Front Office in Medical Record Documentation.
	2.	The security process of identifying the healthcare service provider, who documents the medical records, is called authorship. Validation signifies to the act of verifying the entry made in the records in terms of accuracy and authorship. Refer to sub-section 2.2.1 Authorship Validation and Medical Record Documentation.
	3.	Admission in hospitals can be categorised into scheduled admission and unscheduled admission. Refer to sub-section 2.3.2 Types of Hospital Admissions.
	4.	The billing process of any hospital includes collecting charges from third party payers and patients, posting patient transactions, and following up outstanding accounts. Refer to section 2.4 Billing .
	5.	A brief sheet is often referred to as an admission note that contains patient's status, reasons why the patient is admitted to the hospital or other facility as well as the initial instructions related to the patient's care. A hospital library can be defined as a place that provides Knowledge-based Information (KBI) to the hospital staff and administration as and when required for developing systems and services for patient care. Refer to sub-section 2.5.1 Brief Sheet and subsection 2.5.7 Hospital Libraries .
2	6.	Hospital discharge summary documents contain information related to the patient's care during their stay in the hospital. Refer to section 2.7 Discharge Documentation .
	7.	Biomedical equipment management is the primary function of managing and maintaining medical devices that are used in hospitals. Refer to section

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2.14 Case Study: A Case of Poor Medical Record Documentation

A medico-legal case showcased the poor quality of notes in the medical document of a hospital. As per the case, the resident medical officer (RMO)and the registrar of that hospital did not inscribe medication orders clearly on a patient medication report. On the report, three different antibiotics were prescribed by the physician to be given to the patient at specific time intervals. However, at the end of the chart, an oral order to administer the antibiotic(s) was given. The RMO suggested that all the antibiotics should be given, but the nurse who received the oral orders argued that the only antibiotic that should be given to the patient is the one that is charted next.

The misinterpretation happened because the oral order was neither given properly nor documented in the chart. At the court, the judge pointed out that 'It is clearly a core function of the hospital staff to prescribe medications. It is of fundamental importance that medication charts are correctly written up.' He also mentioned when a change is recommended, it should be immediately documented.

Also, the RMO did not see to it that the oral orders were transcribed into the written medical record during the ward round. Although, notes were taken on a running sheet, it was not entered into the patient record. Thus, none of the other members of the team could know which orders were given, carried out or changed.

Discussion Questions

1. Discuss the problems with the poor quality oral and written medical notes.

(**Hint:** The poor quality oral and written medical notes may lead to misinterpretation of orders, like providing medication dose to patients.)

2. Is it necessary to enter all oral orders given by the doctor during rounds in the patient record sheet?

(Hint: Yes, other nurses and medical staff will not be aware of the changes or new orders given for treatment of the patient.)

2.15 References and Suggested Readings

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CHAPTER



Clinical Services

Structure

- 3.1 Introduction
- Learning Objectives
- 3.2 Concept of Clinical Services and Clinical Departments
- 3.3 Outpatient Department (OPD)
- 3.4 Emergency Department (ED)
- 3.5 General Medical Department
- 3.6 Surgical Department
- 3.7 Maternity Department
- 3.8 Dental Department
- 3.9 Summary
- 3.10 Glossary
- 3.11 Terminal Questions
- 3.12 Answers
- 3.13 Case Study: Clinical Services Implemented by the Afghan Government
- 3.14 References and Suggested Readings

Notes

Learning Objectives

After completing this chapter, you will be able to:

- Define clinical services and clinical departments
- Discuss the concept of outpatient department
- Explain emergency department
- **D** Elaborate the functioning of general medical department
- Describe working of surgical department
- Elucidate operations of maternity department
- Discuss the operations in dental department

3.1 Introduction

In the previous chapter, you have learned the importance of documenting and filing medical records for future references. Clinical services is the medical wing responsible for treating patients or providing direct patient care of any type. It is designed to provide the right care to the patients at the right place and at the right time. A person working in a clinic or hospital cannot be said to be doing a clinical job. Clinical roles involve providing general physician, specialist services as well as nurses for assistance.

Clinical services can be broadly classified into two branches, medical and surgical. Medical services include physician and sub specialities like cardiology dermatology, palliative care, clinical microbiolgy, genetics, etc. while surgical services include general surgeon and sub specialities like orthopaedics, Ear, Nose and Throat (ENT), obstetrics and gynaecology, ophthalmology, transplant surgery, burns etc. In this chapter, you will learn how to operate clinical services by taking care of all its elements like outpatient and inpatient departments, emergency department, general medical department surgical units, maternity and gynaecology department, and dental department.

3.2 Concept of Clinical Services and Clinical Departments

Clinical services are health care services administered by qualified professionals (in the medical field) to the general public. These services aim to restore the health of patients through various scientific resources.

In hospitals, clinical services adopt a scientific and research-driven approach for curing patients. In addition, technology plays an important role in deciding the course of treatment for a patient. Clinical services are diagnostic, preventive, therapeutic and curative in nature. In hospitals, clinical services are provided through various departments such as surgical, radiological, and dental. These departments may also have several subunits dealing in clinical specialities such as paediatric nephrology or paediatric cardiology.

🔁 Self-Assessment Questions 🗋

- _____are health care services administered by qualified professionals (in the medical field) to the general public.
- 2. In hospitals, clinical services adopt a scientific and research-driven approach for curing patients. (True/False)

3.3 Outpatient Department (OPD)

Outpatient department (OPD) is a facility dedicated to the diagnosis and care of outpatients (patients who do not stay overnight for treatment). It can be described as a clinical service department where people come for consultancy and treatment in almost every medical field, such as dermatology, psychiatry, orthopaedics, paediatrics, gynaecology, neurosciences, ENT, and pre- anaesthetics. OPD is often the busiest area of a hospital. As it caters to the largest number of patients, every hospital tries to provide best services in their OPDs.

OPD services are maintained separately from inpatient (patients who stay at the hospital while under treatment.) services. However, both the inpatient and outpatient departments work in co-ordination with each other, and in most cases, inpatients are given treatment in the OPD after their discharge from the hospital. Apart from health issues, a person can visit the OPD for immunisation, health check-up, physiotherapy, etc. Besides rendering medical services, OPD also functions as a centre for imparting education to professional staff by providing valuable and diversified clinical experience to them.

3.3.1 Location and Design of OPD

OPD is generally located at the ground floor of a hospital so that OPD patients don't disturb the inpatients. OPD should be built on a large area near other adjunct services, such as registration booth, emergency department and other social services. In addition, other facilities, such as laboratories, pharmacy, and physical therapy departments should be easily accessible to patients as they often use these facilities during their visits.

As OPD is visited by a large number of people, it should have a separate entrance and appropriate parking facilities. Special pavements should be designed to facilitate the movement of wheelchairs and stretchers in and out of the OPD. Some important areas that need to be considered while designing an OPD are:

- Provision of a clove for wheelchairs and stretchers
- Provision of lobby and lounge to accommodate a large number of people
- Adequate rooms for nearly all the services offered by the hospital
- Easy access to elevators
- Provision of minor operating rooms to perform minor surgeries without inconvenience
- Use of directional signs across the department
- Receptions and information desks
- Watercoolers and washrooms
- Lockable drawers and cabinets for storing employees' personal belongings
- Adequate storage facilities for regular supplies and equipment
- Facility to make STD/ISD calls
- General purpose examination rooms
- Facilities to collect, store, and dispose soiled materials
- Sterilising facilties

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3.3.2 Flow Pattern of Patients

To design an OPD correctly, it is of paramount importance for the hospital to understand the movement of patients. The general flow pattern of patients is as follows:

- 1. A patient first comes to the enquiry room to get the information about the doctor.
- 2. The patient next goes to the registration desk to get himself/herself registered.
- 3. After registration, the patient proceeds to the waiting room and waits for his/her turn.
- 4. The patient goes to the consultation room, once his/her turn comes.
- **5.** After consulting the doctor, the patient next moves to diagnostic facilities, in case the doctor has prescribed so.
- **6.** The last stop for the patient in an OPD is pharmacy, from where he/she can purchase the prescribed medicines.

Fig. 3.1 shows the flow pattern of patients:



3.3.3 Training and Co-Ordination

Proper training is provided to the medical staff of both inpatient and outpatient departments. The training sessions mainly focus on improving communication, ensuring task co-ordination and increasing efficiency, quality and safety among team members.

The co-ordination does not rest between team members alone. Instead, the team members need to coordinate with other departments by organising patient care activities and enabling smooth flow of information among all the participants concerned with patient care services. Some of the important coordination activities are:

- Defining and agreeing on accountability and responsibility.
- Ensuring proper information flow
- Evaluating needs of patients
- Assessing patient needs and goals.
- Monitoring the changed needs of patients.

🔽 Self-Assessment Questions

- 3. OPD only deals with patients who come for immunisation. (True/False)
- **4.** As ______ is visited by a large number of people, it should have a separate entrance and appropriate parking facilities.
- 5. OPD should always be built on the _____ floor.

3.4 Emergency Department

Emergency Department (ED) is the busiest department of a hospital, as all serious cases requiring immediate help, such as accidents, heart failure are brought here for immediate medication. ED is also known as the casualty room or the emergency room. The focus in ED is laid on providing immediate relief and treatment to patients in acute conditions. In such cases, formalities are left to be completed later. ED of a hospital operates 24 hours a day, seven days a week, so that patients can be brought at any time for immediate treatment. All critical condition cases are handled by the ED.

3.4.1 Location and Design

The preferred location of ED is the ground floor of a hospital so that patients and ambulances can have an easy access. The entrance of the ED must be separated from the main hospital and outpatient entrances. As most of the emergency patients need X-ray, the radiology unit must be in close proximity to ED. In addition, ED must be close to the admitting department, record-keeping and cashier's booths to save time in performing formalties.

While designing an ED, some of the important points to be considered are:

- A sheltered entrance for the protection of ambulance patients from weather must be built.
- A paved access must be built, so that patients can be discharged comfortably from ambulances and other vehicles.
- Proper arrangements must be made to control traffic congestion around ED.
- Medical supplies must be easily accessible.

3.4.2 Features of an ED

ED of a hospital generally consists of 6 paediatrics rooms, 34 private patient rooms, 3 trauma focused rooms, and 3 other flexible care rooms. Flexible care rooms are built for patients who do not require continuous or immediate care. ED is designed specifically for those patients whose conditions are critical, so that the doctors and medical staff focus on the serious cases requiring attention. The main features of ED are given below:

- Facilities for X-rays and CT scanning are available.
- MRI and ultrasounds are done 24 hours.
- Biohazard and bioterrorism patients are handled under special decontamination areas.
- Latest critical care equipment is installed in trauma and paediatric rooms.
- 24 hours special on site pharmacy is provided for emergency patients.
- Private examination rooms are built for patients and their families.

3.4.3 Managing an ED

ED cannot be managed by all hospitals due to lack of infrastructure facilities. Understanding the importance of ED, the hospitals must endeavour to provide well organised services to treat the needy patients. To manage an ED properly, hospitals must strive to adopt the following essentials:

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- Competent ambulance services
- Provision of the recovery room
- An efficient team comprising a physician, nurse, and attendant should be available round-the clock or on call.
- The treatment of fractures and similar injuries must be supervised by qualified and competent surgeons
- Competent medical staff to supervise and run diagnostic and therapeutic facilities
- Proper medical record of every patient

3.4.4 Physical Facilities in ED

In ED, the facilities can be divided into two areas: administrative facilities and clinical facilities. Let us discuss these two types of facilities in detail:

- Administrative facilities: Following are the administrative facilities that must be provided in an ED:
 - A reception area must be built to facilitate access to the treatment area.
 - The reception area must include waiting area, pedestrian and ambulance entrance area
 - Adequate space must be provided for stretchers and wheelchairs away from traffic.
 - Public utilities, such as water coolers, public toilets, public telephones, and vending machines must be provided.
- Clinical facilities: Some of the important clinical facilities that must be provided are:
 - O A trauma care area for handling surgical cases
 - Medical examining area
 - Splintage and casting area for orthopaedic cases
 - Observation beds

Self-Assessment Questions

- 6. The ______ is also known as the casualty room.
- 7. Which one of the following is not a feature of ED?
 - a. MRI and ultrasounds are done 24 hours.
 - b. Biohazard and bioterrorism patients are handled in a special decontamination area.
 - c. Latest critical care equipment is installed in trauma and paediatric rooms.
 - d. A sheltered entrance for the protection of ambulance patients from weather must be built
- 8. ED can be managed by any hospital. (True/False)

3.5 General Medical Department

In India, most people prefer going to general physicians for their basic medical needs. Some people prefer consulting their family doctors out of trust. Others are unaware of their specific problems, so they go to general physicians first to know the ailments they are specifically suffering from. The primary care given by the general physicians and by family doctors is known as general medical care. This is the first level of medical care. This is also the most widely accessed department of a hospital. Let us study the important divisions of a general medical department.

3.5.1 Therapy

Therapy refers to a course of action or treatment that is taken to cure a medical problem. It is the pre-diagnosis stage of an ailment. In keeping up with the old proverb "prevention is better than cure", the healthcare industry is also getting preventive in nature. Many healing therapies are becoming popular nowadays. The main aim of therapy is to increase the consciousness of the patient which helps them to identify their own thought process for a particular problem. This realisation is very crucial in finding solutions to serious problems.

Therapy is used in several ailments/problems like psychological problems, cancer, depression, marital problems, stress, infertility, emotional disturbances, domestic abuse, etc. The following are some common types of therapies:

- Physical therapy: It is most popular form of therapy used to relieve muscular pains. It helps in promoting mobility and strength, and improves flexibility while reducing muscle stiffness. It deals with patients from various departments like orthopaedics, paediatrics, neurology, etc.
- **Respiratory therapy:** This mainly deals with patients suffering from cardiac and pulmonic ailments. It also includes the supervision of patients on ventilation in ICUs. Sometimes, the specialists of this department are also engaged in imparting education of asthma, respiratory ailments, etc.
- Occupational therapy: This type of therapy deals with the daily lifestyle of people and making people fit for work. This type of therapy helps people easily adapt to their environment by addressing their physical, emotional, psychological and social needs. Occupational therapy deals with stress, anxiety, fear, depression of people, which is very common these days due to tremendous work pressure and everyday challenges at work.

3.5.2 General Medical and Nursing Care

Before specifically identifying the disease, all patients visit the general medical care department. The first aid treatment related to symptoms and conditions such as fever, conjunctivitis, diarrhoea, typhoid, immunisation, various small treatments, etc. is given by general physicians. These physicians are helped by nurses in doing basic jobs such as monitoring blood pressure, body temperature, weight, etc. Nurses are also involved in the documentation of patients' clinical records, providing information to patients about their ailments and explaining the doses of medicine to them. Without the support of nurses, medical support system would be incomplete.

The role of nurses in medical care in villages is immense. They are involved in health promotion, health education, preventive measures, antenatal and postnatal care, delivery services, care of new born babies, care of the aged people, etc. The importance of general medical and nursing care is discussed as follows:

• They help in reducing the burden of hospitals as individual clinics and nursing homes take share of the medical treatment.

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- Immediate care can be availed, which is convenient and reliable. This saves a lot of time of patients.
- Minimum cost is involved both from the patient and physician's point of view.
- General physicians have a sense of responsibility for the community, which is beneficial for the society. They guide patients in each and every step of their treatment.

3.5.3 Paediatrics

The department of medicine which deals with the medical care of the infants, children and adolescents up to the age of 18 years of age is termed as the paediatrics department. This is a very crucial branch of medicine because it deals with children who are the future of any country.

Paediatrics deals with the mental, physical and social needs of children. It aims to improve health as well as contribute to the growth and development of the young population.

The role of the paediatrician varies with the age of his/her patients. For instance, an infant requires more intensive care, routine immunisations, regular dietary follow ups, acute care for any illness, etc. As children tend to grow rapidly, they need proper guidance and counselling for a healthy and content life. Adolescents are particularly sensitive and need emotional and physical support, especially during puberty and in the process of maturation during which lots of physical and mental changes take place. The following are some of the main responsibilities of a paediatrician:

- To immunise children at the right time.
- To map the child's development, so that appropriate actions can be taken against any reported abnormality on time.
- To test children for any probable illness like vision tests, blood sugar level etc.
- To guide children for any abnormal behaviour like anger, depression, speech problems, deterred maturity, etc.

3.5.4 Psychiatry

The psychiatric ward of a hospital specialises in the treatment of serious mental disorders. These disorders include schizophrenia, clinical depression, suicidal tendencies, violent behaviour, and so on. A psychiatric ward in a hospital manages its own resources and finances. The department is connected to the inpatient ward of the hospital. The psychiatry department can also contact other institutes like rehabilitation centres or larger psychiatric hospitals for patients who require such treatment.

The types of services offered by a psychiatric department include providing acute, medium as well as long-term psychiatric services. The department provides counselling and treatment for psycho-geriatric conditions, opoid detoxification, alcohol rehabilitation, and therapeutic services. Inpatient services related to psychiatry include admission of patients for psychotic, panic, mood disorders, substance abuse de-addiction, alcohol de-addiction, etc

3.5.5 Neurology

Neurology department deals with conditions affecting the nervous system in its normal and diseased states. The department includes treatment of disorders affecting the central and

peripheral nervous system, including nerve coverings, blood vessels and muscles. Doctors specialising in neurology study investigate and treat neurological disorders. They are often involved in clinical research and clinical trial projects.

Patients generally visit the neurology department after being advised by their doctors. The services offered by the neurology department include evaluation of the nervous system, assessment of the patients' cognitive function, motor strength, reflexes, gait, etc. The department also conducts diagnostic tests such as CAT scan, MRI, EEG, EMG, etc.

3.5.6 Cardiology

When it comes to heart and vascular problems, cardiology is a subspecialty of medicine that focuses on providing preventative, diagnostic and therapeutic services to patients. The field of cardiology encompasses a wide variety of subspecialties. These include the following:

- Cardiac electrophysiology: The study of the electrical properties of the heart as well as disorders that affect its conduction.
- Interventional cardiology: The treatment of structural and ischemic disorders of the heart is done using of catheters.
- Echocardiography: The assessment of the mechanical function and physics of the heart is accomplished through the utilisation of ultrasonography.
- Nuclear cardiology: It involves the utilisation of nuclear medicine in order to investigate the process by which the heart absorbs an isotope through the utilisation of radioactive sources.

The cardiology department of a hospital provides treatment for the following conditions related to the heart:

- Congenital heart defects
- ♦ Heart failure
- ♦ Coronary artery disease
- Valvular heart disease
- Electophysiology
- Cardiovascular diseases
- Disorders of the myocardium
- Disorders of the pericardium
- Disorders of the heart valves
- ♦ Vascular diseases

3.5.7 Dermatology

Dermatology deals with the diseases and cosmetic problems related to hair, scalp, nails and skin. Dermatology is classified into three categories:

- Cosmetic dermatology: It deals with the treatment of skin, hair, or nails to enhance a patient's appearance
- Dermatopathology: It involves the diagnosis of diseases affecting the skin, hair, and nails. In dermatopathology, a sample of the affected area is taken and examined through a microscope.

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• **Paediatric dermatology:** It deals with the treatment of diseases affecting the skin, hair, and nails of children, including new-borns and infants.

Following are some of the treatments provided by dermatologists :

- Laser hair removal
- Hair transplantation
- Laser therapy
- Photodynamic therapy
- Removal of tattoo using laser therapy
- Phototherapy
- Cryosurgery
- Vitiligo surgery
- Allergy testing
- ◆ Radiation therapy
- Tumescent liposuction
- Topical therapies to help treat various skin and hair conditions

3.5.8 Pathology

Pathology is a branch of science that deals with determining the causes and effects of diseases. The pathology department of a hospital helps in the examination, diagnosis, treatment and prevention of diseases. The diseases can be diagnosed on the basis of lab reports. The diagnosis can help in detecting the serious ailments, such as cancer and controlling the spread of infectious diseases. The pathology lab also provides reports related to blood groups, Rh-typing, urinalysis, post-operative tests, etc. to doctors to determine specific infections. The pathology department has a modular arrangement that includes:

- Urine-analysis unit
- ♦ Biochemistry unit
- Hematology unit
- Serology-Bacteriology unit

3.5.9 Enterology

Enterology is a branch of medical science that deals with the study of diseases of the intestines/viscera. Gastroenterology is a branch of enterology that deals with the study of diseases/disorders of the stomach and intestines/ digestive system. Gastroenterology deals with the diseases of gastrointestinal tract (GI tract). The GI tract includes all the organs from the mouth to the anus including the alimentary canal.

Some significant diseases of GI tract include gastrointestinal cancers and bleeding. For the detection of abnormalities, tests like colonoscopy, liver biopsy, endoscopy, barium studies, etc. are performed. Some of the common GI diseases are:

- Heartburn
- Ulcers

- Irritable bowel syndrome
- Blood in stool
- Colorectal cancer
- Yellow jaundice
- ♦ Hepatitis C

3.5.10 Blood Bank

A blood bank is a bank that stores and preserves blood or blood components for later use. As blood is considered as a therapeutic agent by the Food and Drug Administration (FDA), a hospital requires a separate license to run a blood bank at its premises. The blood coming to the blood bank has to undergo stringent tests for diseases such as AIDS, STD, Hepatitis, TB, etc. The blood should be stocked in accordance with ABO grouping and Rh factor.

To collect the blood safely, there are some essentials which must be followed. For instance, the blood donor should be properly registered. In addition, the registry should include the name of the donor, sex, address, body weight and a brief medical history. Blood should be collected in a container containing an anticoagulant (Acid-Citrate-Dextrose) and stored at 40 degree centigrade in cold storage. Blood remains stable at 1-60 degree centigrade for 21 days. A special procedure of blood storage and dispatch is followed by the staff of blood bank. Various standard operating procedures (SOPs) are prepared and should be adhered to while working in the storage section of the blood bank.

The blood bank has its own rate card for each procedure. The blood bank should have its own reception area, availability of forms for consent and proper information in case of nonavailability of the required blood group.

3.5.11 Physical Medicine

The department of medicine that deals with physical disability due to certain medical conditions is called the physical medicine department. It specialises in the enhancement and restoration of the lost bodily functions of patients, thus making it easier for them to lead a productive life. The various medical conditions that can lead to impairment are arthritis, stroke, low back pain, spinal injury, brain injury, accident cases, etc.

Physical rehabilitation can be carried out at various places, such as hospitals, health clinics, specialty clinics or sometimes even at the home of the patient. This rehabilitation doesn't cure the damage of the body functions completely, but it definitely helps to gain optimum health conditions and hence improves the quality of life. Some of the important features of physical rehabilitation are:

- It helps to provide ease of movement for patients with severe syndrome.
- Expensive and complicated surgeries can be avoided and the symptoms can be controlled to a great extent.
- It gives a new life to patients with the diseases having no specific medications or cure.
- It is very effective in the long run.
- It has no side effects and is 100% safe.

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3.5.12 Urology

The branch of medicine that deals with diseases of the human urinary system as well as the reproductive organs is known as urology. The organs included in this branch of medicine are the urethra, ureters, urinary bladder, and kidneys.

Urology deals with both surgical and non-surgical cases in certain conditions, such as male infertility, congenital anomalies, renal transplantation, kidney stones, injury caused due to trauma, prostate/bladder cancer, etc. In addition, it also deals with non-surgical conditions. One of the most common examples of non-surgical medical conditions is Urinary Tract Infections (UTI).

Various specialties associated with urology are as follows:

- Endourology: Deals with the diseases of the urinary system. It uses minimal surgical procedures to treat the patient. Examples include endoscopy of the urinary tract, laparoscopy, etc.
- Urologic Oncology: Conducts clinical and basic research designed to develop better methods for detection, prevention, and therapy of patients with genitourinary malignancies of ureters, prostate, urinary bladder, adrenal glands, etc.
- **Neurourology:** Deals with the nerves that control the urinary system. Examples include stroke, Parkinson's disease, abnormal urination, spinal cord disease, multiple sclerosis, etc.
- **Paediatric Urology:** Deals with the disorders of the urinary system in children, such as underdeveloped genitalia, undescended testes, genital abnormalities, etc.
- ♦ Andrology: Deals with the disorders of male reproductive organs. Examples include infertility, erectile dysfunction, ejaculation problems, etc.

3.5.13 Communicable Diseases

Diseases that spread from one person to another or from one animal to a person are known as communicable diseases. The transfer of micro-organisms takes place through air, cough droplets, sputum, animal faeces, etc. Communicable diseases are also known as infectious or contagious diseases. Let us study about a few common communicable diseases:

- Hepatitis: It is a medical condition in which the liver gets inflamed, leading to jaundice. Hepatitis also causes liver cancers. The cause of hepatitis is viral hepatitis. It is caused by a virus.
- HIV/AIDS: This is a medical condition that affects the immune system of human beings. HIV/AIDS is caused by a virus called human immune deficiency virus. It is transmitted primarily through unprotected sexual intercourse. It is also caused by contaminated needles, infected blood transfusions etc. HIV patients face a lot of social stigma, discrimination and the disease as such does not have any cure till date.
- Malaria: Malaria is a disease caused by the bite of the female Anopheles mosquito. It is caused by parasitic protozoa. It causes high fever, headache, vomiting, fatigue, etc. The disease is commonly found among poor people living in unhygienic conditions.

The communicable diseases are widespread and affect a huge number of people. By taking adequate precautions, these diseases can be prevented

3.5.14 Epidemiology

Epidemiology is a branch of science that deals with the causes, patterns, types and effects of diseases existing within a specific group of people. The information derived from epidemiological studies helps to plan and evaluate methods to prevent diseases. It also helps in better management of the infected people.

The term epidemiological triad is very important, as it implies the intersection of agent, host and environment. It is said that this disease occurs in humans when these three major factors interact with each other. Epidemiology is relevant in modern times due to following reasons:

- It provides the basic standard for analysing and explaining the occurrence of disease in a community. It measures factors like the incidence of new cases of diseases, comparison of new cases as compared to last year's which help us in identifying the rate at which the disease is increasing or decreasing within the target population.
- It deals with epidemiological measures like prevalence, incidence, and morbidity.
- It is an important component in evaluation of public health programs.

3.5.15 Tropical Diseases

Diseases that occur in hot and humid tropical and sub-tropical regions of the world are called tropical diseases. The microbes that cause tropical diseases cannot thrive in the cold climate. They grow and multiply in hot and semi hot climate. Most of these diseases are transferred by the bites of various insects like mosquitos. Insects transfer germs like bacteria, virus, etc., which cause various life-threatening diseases in humans.

Some common tropical diseases can be briefly discussed as follows:

- Dengue: It is a tropical viral disease caused by the bite of the Aedes mosquito. The symptoms of the disease include headache, pain in joints, fever and some mild skin rash. In some cases, the disease can turn fatal, causing heavy bleeding, low blood pressure and low platelet count.
- **Leprosy:** It is a chronic infectious disease caused by bacteria. It affects the nerves and the respiratory tract. It is also known as Hansen's disease. If not treated properly, leprosy can cause permanent damage to the skin, limbs, nerves, etc.
- Chagas disease: It is caused by parasitic protozoa found in South America. It is a tropical disease transmitted by blood-sucking bugs, blood transfusion, etc.
- **Filariasis:** It is a disease caused by parasitic filarial worms (nematode worms). It is transmitted by the bite of a mosquito. The most common symptom is the thickening of the skin. This blocks the lymph nodes and, as a result, the movement of the lymph fluid is slowed down.
- Malaria: It is widely prevalent in Africa and India. It is a tropical disease that is caused by the bite of female Anopheles mosquito. Symptoms of malaria include fatigue, high fever, severe headaches, and vomiting. It can also cause death in extreme cases.

3.5.16 Gynaecology

It is essential for every woman to maintain good health. The reproductive organs begin to mature from puberty and need to be regularly checked for any complications. The common

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problems in teenage girls include menstrual pain, irregular periods, white discharge, and pain during urination, etc. All these problems can be addressed effectively by a gynaecologist.

Gynaecology is the branch of medicine dealing with the problems of the female reproductive system. Obstetrics is also closely associated with gynaecology that deals with the complications of pregnant women and delivery of babies.

Gynaecologists and obstetricians use a wide variety of surgical and non-surgical procedures. Some of them are *hysterectomy* (removal of woman's uterus), *laparoscopy* (removal of stones from ovaries), *pap smear tests* (to detect cancer of the cervix), *caesarean section* (cutting the baby from mother's womb), *cervical sutures* (strengthening woman's cervix), etc. In case of breast abnormalities, which can lead to breast cancer, early detection is essential for full recovery. Regular self-examination and mammography done at regular intervals can help detect breast cancer at an early stage.

During pregnancy, regular check-ups are essential to avoid any complications to the mother, abnormalities in the foetus, sexually transmitted diseases (STD), and so on. Gynaecology is essential for antenatal, natal and postnatal care of the mother and the child.

3.5.17 Ear, Nose and Throat (ENT) And Orthopaedics

ENT

The study of the ear, nose, and throat and the medical conditions related to these three organs is known as ENT or otolaryngology. The various types of illness that fall under this specialty include sinus problems, ear pain, throat infection, problems of the larynx, oral cavity, agerelated hearing loss, etc.

An ENT specialist may work with doctors from other specialty in treating a patient with complicated disorders. For example, an ENT doctor may need to work along with a neurosurgeon/dermatologist for patients suffering from disorders of the skull and skin cancers, respectively. An ENT specialist mainly deals with following parts of the body:

- **Ear:** This domain includes surgical and medical treatment for ear infections, hearing problems, facial nerve problems, birth disorders, etc.
- **Nose:** An ENT specialist deals with the problems of nose, such as sinuses, allergic problems of respiration and respiratory tract, deformities of nose, etc. He also deals with the external appearance of the nose.
- **Throat:** An ENT specialist is also responsible for managing diseases of the voice box or larynx. He/she also deals with breathing/swallowing problems.

Orthopaedics

Orthopaedics is a branch of surgery that deals with the injuries of the musculoskeletal system. This type of surgery is also known as orthopaedic surgery. The musculoskeletal system comprises joints, bones, ligaments, muscles, tendons, and nerves, which allow you to move from one place to another. The importance of orthopaedics is discussed as follows:

- Patients having chronic pains and arthritis in which inflammation, muscle stiffness is common, can get relief from orthopaedic treatment.
- Patients who got traumatic injuries or injuries from sports and accidents can be effectively addressed.

- Bone fractures, sprains, dislocations due to sports injury can also be treated well by orthopaedic doctors.
- People who are seeking joint replacement on knees, hips due to chronic pain can get useful suggestions and can lead an active lifestyle.

3.5.18 Chronic Diseases

A chronic disease is a disease that is there in the body for a long time and can only be controlled but not cured. Chronic diseases are very common nowadays, and can be effectively controlled. One of the important chronic disease is cancer. Cancer is controllable only through early detection and treatment.

Diabetes is another serious and increasingly common chronic disease. Early detection and better self-management are essential for preventing diabetes in the long run.

🔁 Self-Assessment Questions

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- 9. _____ refers to a course of action or treatment that is taken to cure a medical problem.
 - a. Therapy b. Nursing care
 - Paediatrics d. Psychiatry
- 10. The psychiatric ward of a hospital specialises in the treatment of serious mental disorders. (True/False)
- 11. $\frac{11}{11}$ involves the use of catheters for the treatment of structural and $\frac{11}{11}$ is chemic diseases of the heart.
- **12.** ______ is a branch of medical science that deals with the study of diseases of intestines/viscera.

3.6 Surgical Department

As the name suggests, this department deals with the surgical interventions required in any part of the human or animal body. The term surgery came from the Latin word *chirurgiae*, which means hand work. In every hospital, there is a separate department that engages in the performance of such procedures, known as the surgical department. In a surgical department, various types of life-saving procedures are carried out on human bodies in sterilised conditions by trained personnel.

In order to perform surgeries, a hospital needs to have a scientifically-designed operation theatre setup. For this, the operation theatre includes the following zones:

- Protective zone: Includes a reception and waiting room for the pre-anesthesia checkup
- Clean zone: Includes recovery room, theatre work room, staff workroom, store, and pharmacy
- Aseptic zone: Includes operation theatre and separate rooms for scrubbing, giving anaesthesia, and sterilising instruments
- Disposal zone: Includes wash up and disposal room

All these zones minimise the risk of infections as well as unproductive movement of equipment, patients and staff. These zones also ensure proper utilisation of space and operation theatres.

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Air changes through heppa filters, humidity, lighting, temperature control are also an area of consideration and should be done as per norms. The number of staff and operation theatres depends on patient load and the number of beds in a hospital. To minimise the risk of infections, everything should be done according to the standard protocols set up by the infection control team and operation theatre staff.

🔁 Self-Assessment Questions

- **13.** Name the zone that includes a reception and waiting room for the pre-anesthesia checkup.
 - a. Protective zone
 - b. Clean zone
 - c. Aseptic zone
 - d. Disposal zone
- 14. The number of staff and operation theatres depends on patient load, number of beds in a hospital. (True/False)

3.7 Maternity Department

Maternity department deals with the diagnosis and prevention of diseases and provisions of treatment related to pregnancy, childbirth and infant care, and the health of the mother. It also includes antenatal and postnatal care.

Maternity department is responsible for providing proper care to mother and child. Therefore, labour room and delivery area should be built as per the standard norms and regulations provided by WHO. Moreover, humidity and room temperature muust be well maintained. Apart form this, proper medical records must be maintained. The records include guidance about diet, immunisation, precautions and both pre and post delivery drugs. Parents should also be guided about family planning and birth and death reporting.

Maternity department does not require a high-end infrastructure, but there should be proper arrangements for timely checkups and ultrasound before delivery and during pregnancy. It is also important to maintain a sterile and hygienic environment. Proper care of the newborn and the mother should be ensured, in case of any complications.

Nowadays, security of newborns is another issue that has come up. Therefore, there should be proper arrangement of identification of the newborn by the name of mother and proper security against theft should be available in and outside the premises.

Self-Assessment Questions

- **15.** ______deals with the diagnosis and prevention of disease and provisions of treatment related to pregnancy, childbirth and infant care.
- 16. Labour room and delivery area should be built as per the standard norms and regulations provided by WHO. (True/False)

Activity

Visit a maternity department in a hospital and write down its sub departments.

3.8 Dental Department

As the name suggests, this department involves the study/diagnosis of diseases and treatment primarily related to teeth. The term tooth comes from the Greek word *odus*, meaning tooth. These days, dentistry is an important field because of awareness in general public regarding their looks and aesthetics. Dentistry is the branch of medicine which deals with diagnosis, prevention and treatment of diseases of the oral cavity. Oral cavity involves gums, teeth, tongue, jaws, salivary glands, etc.

The structure of the dental department largely depends on the kind of facility/treatment it intends to provide, the number of staff as well as patients. There should be a specific area designated for reception and waiting area for visitors. Arrangement of magazines, do's & don'ts related to dental treatment, drinking water and using washrooms must be easily accessible to patients. As a dentist deals with small oral cavities, proper light and ventilation of the area is important while designing the department.

The paint and texture of the roof, walls, and flooring of a dental clinic should be pleasant. It helps in relaxing the mind of the patients during treatment procedures. The chair should be placed near the instruments and tables so that there is no inconvenience in picking up tools, mixing cements, etc. Apart from the treatment room, a room must also be allotted for the technical backend work. To minimise the risk of infections, proper areas for washing hands and dispose the waste should be provided.

🔁 Self-Assessment Questions

- The structure of the _____ department largely depends on the kind of facility/ treatment it intends to provide, the number of staff as well as patients.
- **18.** As a dentist deals with small _____ cavities, proper light and ventilation of the area is important while designing the department.

3.9 Summary

- Clinical services are health care services administered by qualified professionals (in the medical field) to the general public.
- Outpatient department (OPD) is a facility dedicated to the diagnosis and care of outpatients (patients who do not stay overnight for treatment).
- Emergency Department (ED) is the busiest department of a hospital, as all serious cases requiring immediate help, such as accidents, heart failure are brought here for immediate medication.
- Therapy refers to a course of action or treatment that is taken to cure a medical problem.
- The first aid treatment related to symptoms and conditions such as fever, conjunctivitis, diarrhoea, typhoid, immunisation, various small treatments, etc. are treated by general physicians.
- The department of medicine which deals with the medical care of the infants, children and adolescents up to the age of 18 years of age is termed as the paediatrics department.
- The neurology department deals with conditions affecting the nervous system in its normal and diseased states.
- Cardiology is a branch of medicine that deals with the preventive, diagnostic and therapeutic services concerning heart and vascular diseases.

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- A blood bank is a bank that stores and preserves blood or blood components for later use.
- Gynaecology is the branch of medicine dealing with the problems of the female reproductive system.
- Orthopaedics is a branch of surgery that deals with the injuries of the musculoskeletal system.

3.10 Glossary

- **Obstetrics:** It is the branch of medicine and surgery that deals with childbirth and midwifery.
- **OPD:** It is the medical department that is associated with the diagnosis and care of outpatients.
- **Orthopaedics:** It is the branch of medicine that deals with correction of deformities of bones or muscles.
- **Paediatrics:** It is the branch of medicine that deals with the treatment of diseases in children.
- Vascular disease: It is a type of cardiovascular disease that affects blood vessels in the human body.

3.11 Terminal Questions

- 1. Describe OPD.
- 2. Elaborate on some features of ED.
- 3. List various types of therapy departments? Describe each of them.
- 4. Write a short note on surgical departments.
- 5. Explain the need of having maternity departments in a hospital.

3.12 Answers

Q.	Self-Assessment Questions
1.	Clinical services
2.	True
3.	False
4.	OPD
5.	Ground
6.	Emergency room
7.	d. A sheltered entrance for the protection of ambulance patients from weather must be built
8.	False
9.	a. Therapy

CHAPTER 3 \blacksquare Clinical Services

10.	True
11.	Interventional cardiology
12.	Enterology
13.	a. Protective zone
14.	True
15.	Maternity department
16.	True
17.	Dental
18.	Oral
Q.	Terminal Questions
1.	The main services which are provided in OPD's are medicine, dermatology, cardiology, Psychiatry, orthopaedics, obstetrics, paediatrics etc. Refer to sub-section 3.3 Outpatient Department (OPD) .
2.	An emergency department consists of 34 private patient rooms, six paediatric rooms, three trauma rooms, and three flexible care area rooms. Refer to subsection 3.4.2 Features of an ED .
3.	Some of the common types of therapy departments are physical therapy department, therapeutic department, respiratory therapy department and occupational therapy department. Refer to sub-section 3.5.1 Therapy .
4.	In a surgical department, various types of life-saving procedures are carried out on human bodies in sterilised conditions by trained personnel. Refer to section 3.6 Surgical Department .
4. 5.	In a surgical department, various types of life-saving procedures are carried out on human bodies in sterilised conditions by trained personnel. Refer to section 3.6 Surgical Department . Maternity department is responsible for providing proper care to mother and child. Refer to section 3.7 Maternity Department .

3.13 Case Study: Clinical Services Implemented by the Afghan Government

After the end of the Taliban regime in Afghanistan, the country was in dire need of standardised health services for general public. In March 2002, the Afghan Ministry of Health (MoH) initiated the process to address these health problems and provide essential health services. The MoH wanted to expand clinical services to all Afghans, including those living in remote and underserved areas. After considering all important aspects, the crucial health services were developed and defined as Basic Package of Health Services (BPHS). The BPHS consisted of three types of services:

- Services that had the maximum impact on the major health problems
- Services that could address the problems faced by people in a cost-effective manner
- Services that could be delivered to people living in both rural and urban areas

The aims of MoH for introducing BPHS were to provide standardised services and promote equitable access of services to all areas. The main services to be included in the BPHS were in the following areas:
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- Maternal and new-born health
- Child health and immunisation
- Public nutrition
- Communicable diseases
- Mental health o community management of mental problems
- Disability
- Supply of essential drugs

Afghanistan was trying to rise above the crises and needed a stable government to offer health services to public and help them re-establish their lives. Therefore, to make BPHS successful, MoH took the help of NGOs to provide health services to reach more people in all areas. By giving contracts to NGOs, the MoH achieved its target of impacting the lives of the general public to an extent. As a result, communities were positively affected and decided to return to their native places in the country and resettle. However, as time has passed, the country took various steps for more options to eliminate its dependency on NGOs and is moving towards success.

Discussion Questions

1. Discuss the need for BPHS in Afghanistan. What impact these services have on the lives of Afghans?

(**Hint:** The end of Taliban left the country in rough conditions and people needed basic services to renew their lives in the country.)

2. Do you think the decision of taking the assistance of NGOs to reach all the remote areas was correct?

(Hint: Yes, because, after the end of Taliban regime, there was scarcity of resources making it difficult for the government to establish health centres across the country.)

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CHAPTER



Diagnostic Services

Structure

- 4.1 Introduction
- Learning Objectives
- 4.2 Clinical Pathology and Laboratory Department
- 4.3 Radiological Department
- 4.4 Summary
- 4.5 Glossary
- 4.6 Terminal Questions
- 4.7 Answers
- 4.8 Case Study: Diagnostic Services at Henry Ford Health Services
- 4.9 References and Suggested Readings

Notes

Learning Objectives

After completing this chapter, you will be able to:

- □ Explain the concept of diagnostic services
- Discuss the role of the clinical pathology and laboratory department
- Describe the roles performed by the radiological department

4.1 Introduction

Diagnostic services contribute to the provision of fast, cost-effective and high-quality diagnostic treatment to patients working in the healthcare business. This care is delivered in an atmosphere that is both safe and secure. Pathology and laboratory medicine, radiography, and nuclear medicine are all examples of clinical services that are included in this category. Employees that work in diagnostic services in a hospital include medical professionals such as physicians, nurses, technicians, technologists, administrators, and others.

The pathology and laboratory department performs laboratory tests in six major fields: bacteriology, biochemistry, histology, cytology, haematology and serology. These tests assist the medical staff in identifying and confirming the disease and providing treatment for the same.

In addition to the pathology and laboratory department, diagnostic services include radiological services that aim to assist physicians in the diagnosis and treatment of a disease by using radiography, fluoroscopy, radioisotopes, etc. Radiological services can be organised into three different departments, namely, diagnostic radiology, therapeutic radiology and nuclear medicine.

Quality medical and surgical care depends a lot on the availability of prompt, accurate and skilful diagnostic services. A well-planned and organised diagnostic department helps in an efficient flow of services and minimum movement for the patients and staff. This chapter explains the concept and significance of various diagnostic services in detail.

4.2 Clinical Pathology and Laboratory Department

Clinical pathology and laboratory department is one of the most important departments of any hospital as without it no hospital would be able to run smoothly. It is a part of the hospital support services that includes pharmacy, pathology, radiology and preventive health care unit and medical records department. Clinical pathology and laboratory examinations help physicians to get better and more accurate diagnosis results.

Most of the diseases such as diabetes, tuberculosis, syphilis, endocrine diseases, cancer, etc. cannot be diagnosed without the help of laboratory tests. These tests not only improve the quality of treatment but also help in diagnosing diseases in their initial stages so that the treatment could start at the earliest.

These laboratory services also play an important role in surgical treatment. For example, preoperative tests such as blood counts, bleeding time/clotting time, Rh typing, blood typing, urine analysis, hepatitis, HIV, etc. are some of the very significant tests that are required to be performed before surgical treatment.

In a hospital, the laboratory should be at a location that is easily accessible to the patients and staff. The recommended location for a laboratory is the ground floor of the hospital. As the hospital laboratory and pathology centres provide services to the out patients, emergency and admitting departments, surgical departments, intensive care units and radiology units, they should not be located very far from these departments.

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In addition, the sample collection room and report dispatch station should also be located on the ground floor so that diagnosis reports can be easily collected. In most of the hospitals, the laboratory is divided into separate sections, depending on the space available, the technology being used or the specific type of testing being done.

The laboratory department has the following staff members:

- ◆ **Pathologist:** A pathologist is a physician who has a medical degree with specialisation in pathology. He/she is usually the head of the department and a regular member of the medical staff, subjected to the rules and regulations of the hospital.
- Lab technologist: A lab technologist is qualified in the subject of pathology, which includes formal education for three or four years at an accredited university, followed by one year of practice in a clinical laboratory. He/she works under the supervision of the pathologist.

The hospital laboratory activities generally fall under the following sections:

- Haematology/blood bank unit
- Urine analysis unit
- Histology unit
- Serology–bacteriology unit

Let us now discuss these laboratory and pathology sections in detail.

4.2.1 Haematology and Blood Bank Unit

The study of blood, the organs that produce blood and disorders that affect the blood is known as haematology. This subfield of medical research is concerned with the study of the morphology of blood and the tissues that are responsible for producing blood.

A significant component of clinical pathology and the diagnostic procedure, it is an essential component. In addition to the study of the tissues that are responsible for the formation, storage and circulation of blood cells, it also involves the evaluation of the fluid and cellular components of blood. Treatment for disorders that impact the formation of blood and its components, such as blood cells, haemoglobin and blood proteins, as well as the process of coagulation, is accomplished by a physician through the use of the outcomes of haematology tests.

A haematology test aims at knowing the condition of various components of blood that include:

- ◆ PVC Packed cell volume
- Plasma protein
- Total solids
- Total WBC count
- Blood smear examination
- Haemoglobin concentration
- Estimated RBC count
- RBC indices

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Physicians who are expert in haematology are known as haematologists or haematologists. They basically focus on curing haematological diseases. They also work at haematology laboratories, inspecting blood films and bone marrow slides and interpreting various haematological tests. A haematologist diagnoses and delivers the most appropriate therapy for curing haematological diseases. Haematologists may specialise further in:

- Treating bleeding disorders such as haemophilia
- Curing haematological malignancies such as lymphoma and leukaemia
- The field of blood transfusion
- The blood bank
- Bone marrow and stem cell transplantation

Blood Bank

The blood bank is responsible for blood sample testing and issue of blood for therapeutic use or transfusion. It is a place for storing blood or blood components. Ideally, it should be located on the ground floor so that everybody can visit the department without entering the core areas of a hospital. The main functions of the blood bank are as follows:

- Maintaining a list of voluntary blood donors along with their blood groups
- Maintaining records of previous donations, donor's address and contact details
- Collecting, testing, storing and preserving blood
- Separating, storing and preserving blood components
- ◆ Issuing blood/components after cross-matching
- Counselling and motivating donors for donating blood
- Ascertaining the fitness of donors before donation as per the guidelines
- Educating nurses and clinicians about transfusion services

The main premises of the blood bank include the following different segregated areas:

- ♦ Donor recruitment area
- Bleeding complex
- Medical officer's room
- Laboratories
- Issuing counter
- Teaching facilities
- Refreshment area
- Stores
- ◆ Sterilisation and washing room

The blood bank has the following personnel:

- HOD (Should be postgraduate in pathology medicine)
- Resident doctor (must be graduate in medicine)
- Medical officer (must be graduate in medicine)

- Laboratory technicians (graduate in laboratory science)
- Registered nurse (experienced nurse)
- Class IV staff (matric pass)

4.2.2 Urine Analysis Unit

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The urine analysis unit performs a range of tests on urine known as urinalysis (UA). It is also called routine and microscopy (R&M). UA is considered one of the most common methods of medical diagnosis, and many diseases can be diagnosed by urine and stool tests. Diseases related to the gastro intestinal tract (GIT) and kidney and other infections can be monitored by using these tests. The main parameters that can be measured in UA include many substances, such as potassium, urinary calcium, nitrite, phosphate, etc.

4.2.3 Histology and Microscopy Unit

Microbiology is the study of microorganisms, while histology is the study of cells that are organised into tissues according to their structure. The Histology and Microscopy Unit, also known as the HMU, is a research service laboratory responsible for the education of medical professionals. A comprehensive variety of histology and microscopy laboratory services pertaining to human and animal tissues are made available to the research personnel as well as postgraduate students by this section. All of the following services are provided by this laboratory:

- Tissue processing
- ♦ Tissue staining
- Paraffin and frozen tissue sectioning
- Slide coverslipping
- Immunohistochemistry
- ◆ Immunofluorescence
- Microscopy services
- Brightfield and fluorescence slide scanning
- Slides scanning and image analysis
- ♦ STAT lab

The HMU is responsible for providing a high level of service in the areas of histological procedures and research methods. The facility gives clients access to the most up-to-date equipment, which enables them to obtain findings that are both quick and accurate. The following is a list of the functions that the histology unit performs:

- To provide information for assisting physicians in the diagnosis, treatment and prevention of diseases
- To assist in training programs
- ♦ To conduct research

There are some diseases, such as diabetes, syphilis, endocrine disturbances and blood diseases, which cannot be diagnosed without the assistance of the histologic unit. This unit is utilised by a pathologist to examine surgical and autopsy specimens and to select tissues for slide sections to be prepared by the technologist (person responsible for a specific work of the laboratory). The histology unit basically studies two branches of science, which are as follows:

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- Microbiology: This is the branch of biology that studies the structure, function, modes of existence and reproduction, both sexual and asexual, of microscopic organisms. Generally, this is a separate section in the pathology lab because all the specimens of bacteria and viruses are kept here for analysis. This area should be isolated from all the areas of the lab, especially from the blood bank to avoid transmission of infection. Microbiological unit deals with the biotransformation and interactions of microorganisms as well as their control. The microbiology laboratory or microbiological research laboratory is a complete diagnostic lab that performs testing for a full range of human pathogens, including aerobic and anaerobic bacteria.
- **Biochemistry:** It is a branch of science that deals with the study of chemical processes in plants and animals. It studies the structure and properties of molecules in living organisms and how these molecules are made, changed or broken down.

4.2.4 Serology-Bacteriology Unit

The serology-bacteriology unit is responsible for the scientific investigation and analysis of plasma serum as well as other body fluids. The majority of the time, biochemical tests are performed on samples of serum, plasma and urine. These tests involve the measurement of the amounts of particular chemicals, and the results are compared to those of a healthy individual. For diagnostic purposes, in the event of an infection or rheumatic sickness, or in a wide variety of other circumstances, such as determining an individual's blood type, serological tests may be carried out. A variety of immunological deficiencies that are associated with a shortage of antibodies can be diagnosed with the assistance of serology testing.

🔁 Self-Assessment Questions

- 1. Clinical pathology and laboratory examinations help physicians to get better and more accurate ______ results.
- 2. The recommended location for a laboratory is the top floor of the hospital. (True/False)
- 3. Define haematology.
- **4.** ______ is a place for storing blood or blood components.
- 5. The histologic unit provides information to assist physicians in the diagnosis, treatment and prevention of diseases. (True/False)
- 6. The ______ unit involves the scientific study and examination of plasma serum and other bodily fluids.

4.3 Radiological Department

In a hospital, the radiological department is one of the main revenue-generating departments. In this department, crucial diagnosis is done through electromagnetic radiations, which include X-rays, MRI scans, CT scans etc. The latest equipment is used to provide accurate results.

4.3.1 Overview

Radiology is one of the most important departments in a hospital. Ideally concerned with the imaging of internal organs for a better understanding of a patient's condition, radiology has always been an integral part of any medical organisation. Radiology basically deals with Notes

the imaging technology to get an idea about the status of the internal organs of a patient. The imaging uses different techniques to give a clear idea for both, diagnosis and treatment of a condition.

Importance of radiology in medical science can be measured from the fact that it helps in the analysis of a patient's condition directly on the monitor screen in form of visual images. Introduction of radiology has been one of the biggest breakthroughs in medical science, giving doctors an access to the insides of the human body like never before.

Earlier, it was only postmortem that was used to study the human body in detail. However, with the discovery of X-rays, a whole new aspect of science opened up. This led to the development of radiological methods.

Radiology uses X-rays, ultrasounds frequencies, magnetic waves and nuclear modes to get a clear picture of the inside of the human body. All of these methods allow a radiologist to explore one or more aspects of the human body and attain information about its status.

Thus, the radiology department is an investigative branch of medicine that deals with all methods of medical imaging (with or without the use of radiation) as a means for diagnosis, treatment and consultation of a patient's condition.

4.3.2 Functions

As discussed earlier, the radiology department helps in giving doctors a primary idea of a patient's internal condition. Most of the medical conditions cannot be seen externally and can be diagnosed or confirmed only by using internal imaging, which is a part of the radiology department. In several cases, the radiology department not only takes internal images but also assesses them as a means of consultation. In such cases, the department is expected to take images and provide an interpretation for them, which can be further used as a means for diagnosis or treatment by other departments. Broadly, the functions of the radiology department include:

- Using various techniques to take images of the internal organs of the human body
- Interpreting these images to arrive at a diagnosis
- Arriving at the course of treatment by using the information obtained from the images procured
- Interpreting the images taken to provide a consultation to other departments about a possible condition
- Understanding the scope and extent of the efficiency of a treatment based on the effect it has on internal organs
- Predicting, spotting and stopping any possible side effects of a proposed or ongoing treatment
- Working closely with other departments to provide assistance for imaging-based procedures such as gynaecology for the growth of foetus, surgery for tracking emboli, general medicine in biopsies, etc.
- Assessing early symptom for a quick detection and efficient treatment of any condition
- Providing moral support to patients

However, depending on the kind of method being used for imaging, radiological services can be used for various purposes. For example, because of the ability to penetrate in certain

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materials such as body tissue, fat, muscle mass, blood vessels, etc. but the inability to enter in different densities such as bones, stones, etc., X-rays can be used to analyse the conditions of bones.

Ultra sound waves or high-frequency sound waves are also widely used in the radiology department for the imaging of soft tissues. Ultrasound imaging is based on the principle of penetration by high-frequency sound waves into the soft tissue of the body. These sound waves when reflected are assessed by a transponder that decodes the waves to give an image. One of the most common functions of ultrasound imaging is to analyse the growth of foetus during pregnancy. In addition, ultrasound helps to provide information such as the location of emboli in the body (along with tracking their movement) and aids in other operations such as biopsies, intravenous insertions, etc. Hence, radiologists often work closely with departments such as gynaecology and obstetrics for providing their services.

Another technique used by the radiology department is Magnetic Resonance Imaging (MRI). This radiological technique uses magnetic waves and works by assessing the response of hydrogen atoms of water molecules in the body tissue to the oscillating magnetic field created through an MRI machine. This technique has found varied applications, ranging from neuroscience to cardiovascular imaging.

Other techniques used by the radiological department include nuclear imaging that is based on the use of radioactive tracers to get contrast images of a particular organ. Cardiovascular blockages, neural blockages, etc. can be easily and efficiently spotted by using this technique. In order to provide the best services, the radiology department should be equipped with all advanced and modern imaging equipment, providing the full range of radiological services.

4.3.3 Location and Design

In a hospital, the radiology department is one of the most sensitive areas that often deals with hazardous materials such as X-rays, magnetic rays, radioactive materials, etc. Because of the nature of techniques and materials used, it is very important to select the location and design of the department with great care and attention. Ideally, the department should be located at the front part of the setup, which is easily approachable. It should be administered by qualified and experienced radiologists. There should be a separate room for each type of tests and a separate team for each entity.

Location of the room for the radiology department is guided by several aspects, the most important being the safety of staff, patients and those who accompany the patient. As the radiology department consists of several machines that work in combination with each other, it is important that they are placed strategically to give the maximum use of space with the greatest efficiency possible along with ensuring the safety of personnel and saving them from the ill effects of radiation.

4.3.4 X-Ray Rooms

X-ray rooms are well equipped rooms with lead enclosures all around to minimise the ill effects of radiation.

Some of the specifications for the various sizes of the rooms are as follows:

• **Standard room:** A standard room is one in which the room size has a standard value. It can have various components such as a height adjustable table, standard floor stand, automatic collimation, electronic tomography, etc.

- Small room: This is a room with a small floor size. It may have an L-shaped compact floor stand, vertical stand, fixed table, etc.
- **Digital standard room (budget):** The various components in this type of room are moveable trolley, ceiling suspension, acquisition console, digital flexible stand, etc.
- **Digital standard room:** The various components in this room include a digital movable stand, single sided suspension table, ceiling suspension, acquisition console, etc.

The place where the initial rough image of the X-ray is processed so that it can be seen clearly and examined is termed as the dark room. This room should maintain high quality standards in order to develop correct and accurate films for diagnosis.

The layout of the dark room is very crucial. It should be well constructed, and the processing solutions should be maintained and preserved properly. While constructing a dark room, the following points should be kept in mind:

- The floor size of the room should be 8x6 feet minimum though it changes with each establishment.
- There should be enough electrical and water outlets with available supplies.
- The room must be made completely dark with a special focus on making it light proof. Any amount of light can damage the films permanently.
- The size of the room should not be too large or too small; it should be just adequate.
- The room should be located near the examination area.
- Special focus should be given so that the room is not too damp or is exposed to excessive temperatures (both high and low).
- The ventilation system of the room should be good.
- The room should contain one wet bench, one dry bench and one sink.
- The walls should be painted in either white or cream colour as they act as good reflecting surfaces.

Fig. 4.1 shows the general X-ray room floor plan:



Fig. 4.1: General X-ray Room Floor Plan (Source: http://www.wikiradiography.com/page/General+X-Ray+Room+Layout)

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4.3.5 Types of X-Ray Machines

X-rays are a type of light beam that is invisible to the human eye and may penetrate a wide variety of materials to variable degrees, depending on the intensity of the beam. As a result of the various levels of exposure on the film, the image that is captured on the film allows you to observe different structures that are located within the body. There are several different types of radiation-generating devices, one of which is an X-ray machine (RGD). A few examples of various kinds of X-ray machines are as follows:

- **Bone X-ray machine:** The most popular type of X-ray machine is depicted below. It is made up of an X-ray tube that is placed on top of a table that is used for examination. There is either an image recording plate or X-ray film located beneath the examining table. There is the ability to move the X-ray tube in accordance with the specific area of the body that requires an X-ray. In order to go through the body, photons are emitted by the tube.
- ◆ **CT scanner:** In addition to producing digital radiographs, this apparatus is capable of taking two-dimensional photographs of an individual. It is a straightforward process in which the patient is positioned on the examination CT scanner table in the supine position. The patient must not have any metallic or magnetic goods on their body, such as jewellery, mobile phones, rings, or other similar items. After that, X-ray detectors rotate around the patient different angles and degrees to create a live image, which is then processed by the computer and displayed on the screen.
- Linear accelerator: In the field of radiotherapy, linear accelerators are utilised. In order to eradicate cancer, they direct powerful beams of radiation to the tumours, which does not have any adverse effects on other areas of the body. The machine in question is a representation of hard X-ray, in which the photons are extremely powerful.
- Backscatter X-ray: These machines are advanced modalities of X-ray imaging. Backscatter imaging machines can look beneath the surface and create digital images on the screen.

4.3.6 Radiation Therapy Staff

Radiation therapy or radiation oncology employs staff that works under a radiation oncologist doctor. They are specifically trained personnel who are authorised to plan dosage for radiotherapy or cancer patients, undergoing treatment for any type of cancer in the body. Radiation therapy staff includes the following:

- Radiation oncologist: A radiation oncologist's basic qualification could embody graduate in drugs and postgraduate in radiation medicine. His/her basic responsibility is to perform radiotherapy.
- **Medical physicist:** A medical physicist is responsible for keeping a check on the medical facet of the cancer actinotherapy treatment. He/she works with a radiation specialist to assess the overall condition of the patient from time to time.
- **Radiation safety officer:** A radiation safety officer prepares a daily radiation prescription. He/she is a graduate of the certified programmes of actinotherapy technology and is certified by Bhabha Atomic Research Centre (BARC). Radiation therapists/radiation safety officers assist in performing simulation and treatment functions in the direction of the radiation specialist.
- Radiation medical specialty nurses: They are trained nurses who work with radiation oncologists. They are integrally concerned with patient assessments and teaching patients and their families about the treatment. Nurses conjointly offer the simplest recommendation and emotional support required to the patient and his/her relatives. On a regular basis, they check a patient's blood reports etc.

The radiation therapy staff should have information about:

- Emission and nuclear reaction
- Interactions of radiation with matter
- Biological effects of radiation
- Radiation detection, radiation detection instruments and personnel dosimeters
- Basic radiation protection principles and sensible safety practices (including time, distance and shielding)
- Radiation protection rules

In addition, the radiation therapy staff should also have an expertise in using various radiography methods.

4.3.7 Ultrasonography (USG)

Ultrasonography, often known as USG, is a diagnostic imaging procedure that is based on ultrasound that assists in visualising internal body structures such as muscles, joints, arteries, and other internal organs with the purpose of identifying pathology or lesions. This method is utilised extensively in the process of checking a pregnant woman in order to assess the growth of the baby as well as other issues. An ultrasound image, often known as a sonogram, is produced when a beam of ultrasound is brought into contact with tissues by the utilisation of an ultrasound transducer (probe). This sound returns to the machine after being reflected from the tissue, where it is then captured and shown as an image. The use of ultrasound can result in the formation of a variety of pictures that can be observed and analysed in real time. The value of USG is extremely low, and it does not include the use of radiation that is dangerous. There are many different kinds of ultrasonography, including the follow:

- **Doppler:** Doppler measurements, which make use of the Doppler effect to evaluate the movement and velocity of structures such as blood, can be used to improve ultrasound in a variety of ways. When the frequency of flow in an artery is calculated, the speed and direction of the flow can be computed and visualised from that point on. According to cardiovascular research, this is helpful. The information about the Doppler pattern is presented in graphical form or as a picture. This Doppler shift is frequently and forcefully portrayed through the utilisation of stereo speakers, which generate a sound that is characterised by a throbbing quality.
- 3D USG: It is a highly advanced kind of ultrasound that displays pictures in threedimensional formats.

USG helps in:

- Diagnosing the condition of the foetus that helps in generating information such as the expected date of delivery and growth level of the child
- Diagnosing soft tissue injuries (pain, infection, swelling, etc.)
- Determining the level of vitamins/minerals in the body
- Diagnosing abnormalities in organs such as the gall bladder, kidney, heart, pancreas, brain, etc.

4.3.8 CT Scan

CT scan is also known as Computerised Axial Tomography or CAT scan. As CT scan uses the concept of imaging body in parts and then superimposing the images with help of

Notes

Notes

computerised algorithm, it is given such name. CT scan was first invented in 1972 by Godfrey N Hounsfield and Alan Cormack.

CT scan is basically a method of diagnostic imaging that makes use of X-rays to get axial images of the human body. The X-rays are combined with computer-generated arithmetic formulations to allow a complete penetration of the human body. The images thus obtained give a clear picture of the anatomical characteristics of the person. This is a very important tool in medical science as doctors get unmatched images of the internal view of the person.

The CT scan is a highly convenient technology that combines X-rays with computer algorithms to give axial images. The images obtained are highly descriptive. Being a non-invasive method of imaging, CT scan finds wide applications in the field of diagnostic imaging. Even though it too relies on X-rays for the purpose of imaging, a CT scan differs from X-ray imaging, as it gives much more descriptive images. Also, it is possible to visualise the anatomy of the human body through this method as opposed to only orthopaedic analysis in X-ray imaging. Using this technique, various body parts such as the heart, brain, blood vessels, pelvic areas, spine, etc. can be viewed. It also gives a greater versatility for analysing the human body.

Functions

A CT scan works on the principle of the imaging of internal organs by using X-rays. X-rays generally have the peculiar property of penetrating substances of certain density while being blocked by others. CT scan combines this power of X-rays with the computer to get a detailed image of the human anatomy. As the name suggests, it is a computerised axial imaging method that takes pictures of the body by using 'tomograms' or sliced pictures. These 'slices' or pictures are then superimposed on each other by using algorithm-based computer program to give a complete picture of the internal organ in question.

A CT scan consists of a moving table on which the patient lies down. This particular position allows the X-rays to focus on the axial aspect of the human body. High-power X-rays are thrown onto the patient by means of strong electromagnetic fields. The basic idea behind the working of a CAT scan is same as that of the X-ray.

In case of a CAT scan, the X-rays instead of coming in from one direction alone fall from all directions. The use of strong moving electromagnetic field allows the X-rays to quickly change directions so that they cover a complete angle in a matter of seconds and help in attaining a 3D image. The electromagnetic field is obtained by means of a powerful electric field.

Based on the principle of electromagnetism, the strong electric field also has a strong magnetic field. A coil is made out of a conductor and placed in a semi-circular arc-like structure over the platform. Through this coil, a strong current is passed. This current gives rise to a strong magnetic field with poles changing quickly. As the poles of the magnetic field change positions, the X-rays are generated from all angles, falling at the patient at different locations. These changing locations give images of the human body in forms of 'slices,' which are then combined to get the complete 3D image of the body or body part.

Types of CT Scan

A CT scanner is used so widely in diagnostic science primarily because of its wide applicability. Even though different types of scanners are available, all of them work on the same basic principle as mentioned above. However, different scanners vary in terms of equipment used, resolution of the images, etc. Notes

The CT scan also depends on the part of the body that is to be scanned. There are specialised scanners dealing with abdomen, legs, brain, heart, etc. Depending on the particular body part, the kind of scanner can differ. CT scan equipment can be classified into the following types:

- **Conventional CT scan:** It is based on the same principle as mentioned above. This is the classic CT scanning equipment that uses the X- rays produced by a quickly changing electromagnetic field. An electromagnet is placed in the semi-circular arc around the platform on which the patient to be scanned lies axially.
- Helical CT scan: It is a refinement of the earlier available technology of CT scanning that allows the imaging of internal organs with much greater details. This is achieved by means of a much faster and higher resolution imaging of the organs, which will allow scans to capture much more minute parts of the human body such as blood vessels, insides of thoracic cavity, etc. This is achieved by means of a constantly moving platform onto which the X-rays fall. In this scan, the X-rays have a helical trajectory relative to the patient as compared to the axial trajectory in case of a conventional scan. This allows imaging in much more fine details.

4.3.9 MRI

The gold standard in diagnostic radiological imaging is magnetic resonance tomography (MRT), nuclear magnetic resonance imaging (NMRI), or magnetic resonance imaging (MRI). This method of medical imaging radiology examines the physiological and anatomical structures of the human body. Injuries or abnormalities that do not show up in CT scans can be better understood with the use of MRI. MRI creates pictures of the body by using radio waves and powerful magnetic fields.

When it comes to diagnosing medical conditions, MRI is incredibly versatile. If both the MRI and CT scans are anticipated to produce identical results, the MRI should be used because it does not emit any ionising radiation. The MRI scanner is a huge cylinder with strong magnets within. While the scan is underway, the patient lies inside the cylinder. The MRI scanner is operated and controlled by a radiographer who is located in a separate room, away from the scanner's magnetic field. During an MRI scan, the patient must remain completely still and not move a muscle. The time required to complete the scan ranges from fifteen to ninety minutes, depending on the area being scanned and the quantity of photos that need to be captured.

An MRI scan can be used to examine:

- Brain and spinal cord
- Bones and joints
- Breasts
- ◆ Heart and blood vessels
- Internal organs, such as the liver, womb or prostate gland

The outcomes of an MRI scan can be used to diagnose situations, design treatments and measure how effective previous treatment has been.

Notes

4.3.10 ECG

Electrocardiogram (ECG) is used to assess the electrical rhythm, conductivity and functions of heart muscles. Abnormal pulse and rhythms could have an effect on the heart's ability to pump blood and supply chemical element to the body. It is a non-invasive technique that is used to assess the heart's electrical conduction system.

Transforming the electrical impulses generated by the heart's polarisation and depolarisation into a waveform is what an electrocardiogram (ECG) is all about. This waveform records the heart's electrical activity, including its rhythm, size, and location, as well as any damage to the heart, the effects of medications or devices like a pacemaker, and more.

An ECG shows:

- The pace of heart beating
- The strength and timing of electrical signals when they pass through each part of the heart
- The rhythm of the heartbeat to understand whether they are steady or irregular

🔁 Self-Assessment Questions

- 7. _____ deals with the imaging technology to get an idea about the status of the internal organs of a patient.
- 8. _____ imaging is based on the principle of penetration by high-frequency sound waves into the soft tissue of the body.
- **9.** The place where the initial rough image of the X-ray is processed so that it can be seen clearly and examined is termed as the _____.
- **10.** Which of the following devices takes two-dimensional pictures of an individual and produces digital radiographs:
 - a. Linear Accelerator
 - b. CT Scanner
 - c. Bone X-ray Machine
 - d. Backscatter X-ray
- 11. Ultrasound images, called ______, are made when a beam of ultrasound is transferred into tissues by using an ultrasound transducer (probe).
- 12. USG helps in diagnosing abnormalities in organs such as the gall bladder, kidney, heart, pancreas, brain, etc. (True/False)
- 13. Why is the use of MRI preferred over CT scan?
- 14. ______ takes electrical impulses produced by the polarisation and depolarisation of the cardiac tissue and converts it into a waveform.

Activity

Visit a hospital's ECG room and note down the equipment that the department uses.

4.4 Summary

- Clinical pathology and laboratory department is a part of the hospital support services that includes pharmacy, pathology, radiology and preventive health care unit and medical records department.
- Haematology is the branch of medical science that studies the morphology of the blood and blood-forming tissues.
- Blood bank is a place for storing blood or blood components.
- The urine analysis unit performs a range of tests on urine known as urinalysis (UA).
- UA is considered one of the most common methods of medical diagnosis, and many diseases can be diagnosed by urine and stool tests.
- Histology is the study of cells organised into tissues, and microbiology is the study of microorganisms.
- The serology-bacteriology unit involves the scientific study and examination of plasma serum and other bodily fluids.
- In a hospital, the radiological department is one of the main revenue-generating departments. In this department, crucial diagnosis is done through electromagnetic radiations, which include X-rays, MRI scans, CT scans etc.
- Ultrasonography (USG) is an ultrasound-based diagnostic imaging technique that helps in picturing internal body structures, including muscles, joints, vessels and other internal organs for pathology or lesions.
- CT scan is basically a method of diagnostic imaging that makes use of X-rays to get axial images of the human body.
- Magnetic Resonance Imaging (MRI) uses magnetic waves and works by assessing the response of hydrogen atoms of water molecules in the body tissue to the oscillating magnetic field created through an MRI machine.
- Electrocardiogram (ECG) is used to assess the electrical rhythm, conductivity and functions of heart muscles.

4.5 Glossary

- **Backscatter X-rays:** It is an advanced X-ray imaging technology that detects the radiation reflected from the target.
- **Biochemistry:** It is the branch of science that is concerned with the chemical and physicochemical processes that occur within living organisms.
- MRI: It is the radiological technique in which magnetic waves and radio waves are used to produce minute details of the affected part of the body.

4.6 Terminal Questions

- 1. Discuss the significance of a haematology test.
- 2. What are the major functions of the urine analysis unit?

Notes

- 3. What is a serological test?
- 4. What is the role of the radiological department in a hospital?
- 5. List the different types of X-ray machines and their specific uses.
- 6. Discuss the concept of MRI.
- **7.** Why is an ECG test done?

4.7	Answers
Q.	Self-Assessment Questions
1.	Diagnosis
2.	False
3.	Haematology is the study of blood, organs that make blood and blood diseases.
4.	Blood bank
5.	True
6.	Serology-bacteriology
7.	Radiology
8.	Ultrasound
9.	Dark room
10.	b. CT Scanner
11.	Sonograms
12.	True
13.	As MRI does not use any ionising radiation, its use is preferred over CT scan, in case both are expected to generate the same information.
14.	ECG
Q.	Terminal Questions
1.	Haematology is the study of blood, organs that make blood and blood diseases. Refer to sub-section 4.2.1 Haematology and Blood Bank Unit .
2.	The urine analysis unit performs a range of tests on urine known as urinalysis (UA), one of the most common methods of medical diagnosis. Refer to sub-section 4.2.2 Urine Analysis Unit .
3.	Serology tests help to diagnose various immune deficiencies related with the lack of antibodies. Refer to sub-section 4.2.4 Serology-Bacteriology Unit .
4.	In a hospital, the radiological department is one of the main revenue-generating departments. In this department, crucial diagnosis is done through electromagnetic radiations, which include X-rays, MRI scans, CT scans etc. Refer to section 4.3 Radiological Department .
5.	The different types of X-ray machines include bone X-ray machine, CT scanner, linear accelerator and backscatter X-ray. Refer to sub-section 4.3.5 Types of X-Ray Machines .

6. Magnetic Resonance Imaging (MRI) uses magnetic waves and works by assessing the response of hydrogen atoms of water molecules in the body tissue to the oscillating magnetic field created through an MRI machine. Refer to sub-section 4.3.9 MRI.
7. Electrocardiogram (ECG) is used to assess the electrical rhythm, conductivity and functions of heart muscles. Refer to sub-section 4.3.10 ECG.

4.8 Case Study: Diagnostic Services at Henry Ford Health Services

In multiple contexts, Mediphan's DistanceDocTM and MedRecorderTM products are utilised by Henry Ford Health Services. With its innovative initiatives and cutting-edge research, the organisation is a frontrunner in the field of remote diagnostics. As part of a joint effort with the Olympic Training Facility in Colorado Springs and Lake Placid, the centre has lately partnered with GE, maker of portable ultrasound equipment known as GE LOGIQ Books.

Henry Ford's Department of Surgery's IT programme manager, Jack Butler, was given the mission of figuring out how to get moving and still ultrasound pictures from the LOGIQ Books to the doctors who do the diagnosis. The Mediphan system has been used to successfully remotely evaluate injuries to skaters and wrestlers, according to Dr. Scott Dulchavsky of Henry Ford's Department of Surgery. "We are still in the early stages of our research," he says. For our study, General Electric, and the Olympic squad, this is a monumental victory. Images of the musculoskeletal system (bones, joints) and soft tissues are both captured by DistanceDoc to a diagnostic standard (organs, blood flow, corneas, etc.). This move significantly advances the center's overarching mission of making its research accessible to underprivileged areas and the widest potential audience.

According to Butler, "our ambition is that one day we'll be able to send out a kid on a bike with a portable ultrasound equipment to scan the population of an entire town," which will help them identify which patients require medical attention. That goal appears more attainable now that DistanceDoc and GE's portable ultrasound equipment are available.

Discussion Questions

1. What products are being used by Henry Ford Health Services?

(Hint: Henry Ford Health Services uses Mediphan DistanceDocTM and MedRecorderTM products in various settings.)

2. What is Jack Butler's vision?

(**Hint:** According to Butler, "Our vision is that one day we'll be able to send out a kid on a bike with a portable ultrasound machine to scan the population of an entire village".)

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CHAPTER



Nursing Services

Structure

- 5.1 Introduction
- Learning objectives
- 5.2 General Nursing Unit
- 5.3 Paediatric Nursing Unit
- 5.4 Obstetrical Nursing Unit
- 5.5 Psychiatric Nursing Unit
- 5.6 Isolation Rooms
- 5.7 Intensive Care Units (ICUs)
- 5.8 Coronary Care Units (CCUs)
- 5.9 Newborn Nurseries
- 5.10 Summary
- 5.11 Glossary
- 5.12 Terminal Questions
- 5.13 Answers
- 5.14 Case Study: Evaluation of Outsourcing in Nursing Services, Kashani Hospital, Isfahan
- 5.15 References and Suggested Readings

NOTES

Learning Objectives

After completing this chapter, you will be able to:

- Define nursing services
- □ Explain its role and responsibilities in maintaining health care services
- □ Identify the different units under nursing services
- Discuss the administration of CCU and other care units by nurses

5.1 Introduction

Nursing is a gracious profession, which can be defined as a practice of providing care for the sick and infirm. Though hospitals give major importance to the medical fraternity, nurses are also largely responsible for delivering excellent patient care. Nurses take care of the patients and help them in every possible way for their fast recovery. They are not only engaged in patient care, but also take an active part in health education, promotion of health, prevention of diseases, maintaining physical well-being, etc. Nursing services play a vital role in hospital operation and management.

In the last chapter, you have learned about clinical and diagnostic services. In this chapter, you will learn about nursing services and its role in hospital administration. Also, you will study about the various nursing units, such as general nursing unit, paediatric nursing unit, obstetrical nursing unit, psychiatric nursing unit, Intensive Care Units (ICUs) and Coronary Care Units (CCUs).

5.2 General Nursing Unit

Nursing department or unit of a hospital aspires to provide the best possible nursing services to the patients with the highest level of care and compassion. Nurses are supposed to be with the patients all the time and take care of their needs. They should demonstrate caring attitude, dedication, promptness and patience while dealing with patients.

Some of the objectives of the nursing units are as follows:

- To provide the right information to the patients and their relatives regarding investigations and procedures.
- To take patient's consent before any surgery/treatment.
- To provide comprehensive and effective care as per each patient's requirements.
- To formulate and develop clinical research activities so that superior quality standards of nursing care can be provided.
- To provide training to the trainee nurses and guide them with the day to day activities of nursing services.
- Now, let us discuss some of the important aspects of a general nursing unit.

5.2.1 Functions

The nurses have to perform a variety of functions every day because of which they are considered as very hardworking, caring and efficient assets of a hospital. Some of the major functions performed by them are as follows: Notes

- Patient care is the main function of the nurses. The activities involved in the nursing process are planning, implementation, assessment and evaluation.
- Generally, nurses are responsible for the total care of the individual patients assigned to them.
- It is absolutely mandatory for the nurses to maintain personal sanitation and hygiene. Their dressing should be proper and they should maintain proper grooming standards in order to appear presentable.
- Nurses should participate in various skill development initiatives, workshops and training programs for enhancing their knowledge and improving patient care.
- The nursing superintendent should effectively address any grievances of the patient regarding negligence of duty, lack of efficient care, etc.

5.2.2 Location

The location of a nursing station is vital as it is the heart of nursing activities. The nursing station should be located in such a position that it helps in providing maximum patient care. There are some factors which need to be taken care of during planning the location of the nursing units:

- Light and ventilation
- Centralised visual control
- Elimination of drafts

Based on the location, there can be two types of nursing stations:

- Centralised: They are the traditional nursing stations with large single units. This type of nursing units provides enough space for various professionals like doctors, nurses, physiotherapists, pharmacists and other support staffs to collaborate with each other. The public places in the unit are separated from the private spaces of the unit. Individuals are supposed to take permission from centralised stations before entering the patients' rooms.
- **Decentralised:** They are smaller and modern units located closer to patients' rooms. They allow nurses to take care of the patients closely and also reduce their walking time. They also increase the visibility of each patient.

5.2.3 Design

The design of the nursing unit is very important in order to achieve the desired nursing care. There are three things which need to be kept in mind while designing the nursing unit, which are as follows:

- All the required facilities including nursing stations should be united in order to reduce nurses' walking time.
- Unnecessary communication should be reduced.
- Maximum contact should be created between patients and nurses.

Notes

There are three main types of designs of a nursing unit:

- Linear corridor unit design: They are single or double corridor layouts. The nursing station is in the middle and it allows easy access as well as visibility to all patients' rooms.
- Cluster design: In this type of design, the patients' rooms are clustered around the nursing stations. One nursing station acts as the main reception area to the surrounding rooms. Patient support services are decentralised in each pod. Each nursing pod consists of a cluster of six to twelve beds. It keeps the drugs closer to patients and all the patients are well visible.
- Radial nursing unit design: In this type of design, patients' rooms are organised around the sub-stations of nursing within each nursing unit. During night shifts, less number of nurses can perform their duty well in this type of design. It provides the nurses a clear view of each patient's room. Nursing staff are more satisfied with this type of design of the nursing unit.

5.2.4 Organisation

The nursing superintendent serves as the unit's head according to the standard organisational chart assisted by the Deputy Superintendent of Nursing. Staff nurses and nursing aides are the frontline nurses who deal directly with patients on a daily basis. The in-charge ward keeps an eye on them.

The Nursing Superintendent does the planning and formulation of policies and is considered as the captain of the entire nursing unit. The roles and responsibilities of each position vary from organisation to organisation.

5.2.5 Facilities and Space Requirements

The essential facilities which should be kept in mind for a nursing unit are as follows:

- Lighting should be adequate and should be preferably glare free especially in in-patient departments. The illumination of nursing station should be around 300 lux.
- Generally, the water requirement is 450-500 litres per bed per day. Therefore, there should be a separate tank for the fire fighting process.
- Well-ventilated rooms with exposure to natural daylight are essential.
- The electricity requirements are 2W per bed per day especially for tertiary care hospitals/super speciality hospitals.
- There should be provision for toilets/sleeping facilities for parents who are staying with their minor children.
- Treatment and dressing rooms should be there for providing first aids to minor wounds.
- Clean utility rooms should be there for preparing and storing all sterile materials needed for effective patient care.
- Isolation rooms should be there for patients suffering from infectious diseases.
- Arrangements for equipment like oxygen cylinder, suction machines should be there to cater to the different needs of the patients.

CHAPTER 5 ■ Nursing Services

Notes

The space requirements depend on the specialty where the nursing unit is located. In High Dependency Units and Intensive Care Units, a space of 3.5m x 3.5m is required for a nursing station to accommodate cardiac and respiratory equipment. However, for general wards, a space of 2.4m x 3.0m is required to accommodate nursing trolley, etc.

🔁 Self-Assessment Questions

- 1. Nursing unit is headed by _
- 2. Lighting is not important in the nursing department. (True/False)

Activity

List any four activities of a nursing unit.

5.3 Paediatric Nursing Unit

The paediatric nursing unit is the department that is concerned with children. This is one of the crucial units where special care is provided as it deals with children. Now, let us discuss the important aspects of paediatric nursing unit in the subsequent sub-sections.

5.3.1 Location

This department should be located in a quieter place of the hospital, which is away from the major traffic of the hospital. This unit should have a play area for the children. Ideally, the play area should be on an enclosed terrace with lots of open space. The rooms of the department should be big and well ventilated. It should also have ample of natural sunlight. The department should also be easily accessed from all the other departments and should be adjacent to elevators.

5.3.2 Design

The paediatric department, unlike the other departments of the hospital, deals with infants and children. Some of the special considerations of this department are as follows:

- It is recommended that the minimum floor space for a single occupancy room should be 100 square feet. However, it is highly advisable to have a standard floor space of 125 square feet for single rooms in order to have sufficient spaces around each bed for carrying out daily activities.
- The area made for cribs should be same as the area for beds.
- Children love colourful and cheerful environment especially when they are ill. So the paediatric wards should be designed in such a way that the colour, décor, equipment, lighting, facilities, etc., create a positive impact on the children.
- The paediatric unit should have its own centralised nursing station. It should be situated in close vicinity of the infants' rooms, as they need maximum care and attention of the nurses.
- One baby food preparation room should be present with a refrigerator, sink and counter. This is useful for preparing foods for babies or for arranging and labelling of the purchased baby foods.

Notes

- A storage room for sterile supplies, linens, educational toys should be there. One bulletin board and chalkboard should also be present.
- A playroom should be made for recreation and group activities of children according to the age. The room should be vibrant with bright wall paints. Also, it should have sound proof walls, so that the sounds cannot go out and disturb the other areas of the hospital.
- One or more isolation rooms should be made for children suffering from infectious diseases. The room should have one bed, one sink, one foot operated waste box, one cupboard for clean/sterile items and a small cabinet for masks and gowns.
- One separate room for examination and treatment of infants is highly desirable. The room should have sufficient number of examination tables as well as sufficient lights.
- Provisions should be made for accompanying mothers or relatives of very young children staying in the paediatric unit. Arrangements for separate beds, toilets and storage of personal items should be made in order to prevent any chaotic situations.
- Depending on the budget, bedside monitors should be made available. If the budget does not permit, at least one or two central monitors should be present. This allows better visual control of the patients.

Self-Assessment Questions

- 3. Standard floor space of paediatric unit should be _
- 4. The paediatric department should be located at a crowded place. (True/False)

5.4 Obstetrical Nursing Unit

Obstetrics nursing unit helps in caring for women during pregnancies and childbirth. Obstetrics nurses specialise in assisting doctors in the care of pregnant women and in the delivery of babies. They work in the labour & delivery department in hospitals. Obstetrics nurses can be termed as caregivers. They pay attention to detail and have great patience to work under pressure.

5.4.1 Location

The obstetrics unit should be located in close vicinity to the labour delivery suite and the gynaecological department. Although, newborn babies are kept with their mothers only, there is a need to construct nursery in cases where the mother is too sick to take care of the baby or due to cases like infants suffering from infections, conditions like premature babies, etc. Thus, this department should also be close to the nursery in hospitals where infants are kept separately. Also, the department should be close to elevators for the ease of transportation.

5.4.2 Facilities and Space Requirements

There should be at least one delivery room, one labour room, and recovery and post-mortem rooms in the obstetrics department. Following are some of the other facilities required for an obstetrics department:

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- Nurses' station within this department should be located centrally.
- Separate rooms should be there for storage, as well as preparation of medicines for both general and emergency department.
- Conference rooms should be made for the antenatal classes and patient education programs.
- Ultrasound scanning room can be provided inside this department, though it is not mandatory.
- Newborn infants should be provided with nursery rooms. An area of minimum 30 square feet per infant is recommended.
- Air conditioning should be provided to maintain a constant temperature and humidity conditions required for the comfort of the infants. The ventilation effect of AC minimises the risk of bacterial contamination. Hence, it helps in providing a safer environment.
- One pre-mature nursery should be set up especially in super speciality hospitals catering to mother and child care only. This is for babies who are born before their due dates. They need critical care in the initial period in order to survive. Also, around 70 percent of the pre-mature babies need incubators (special type of equipment), which should be made readily available. This type of nursery should be there in the post-partum unit sharing common facilities with the primary nursery.
- Rooms for storage of linens, maternity gowns, etc., should be there.
- High-risk labour rooms should be provided for complicated delivery cases including caesarean deliveries. In such cases, mothers should be kept under strict observation for any possible source of infection or any other complications.
- Pain management facility can be there inside the obstetrics department, though optional, for taking care of the labour pains of pregnant women. Physicians specialising in pain management should guide patients regarding their individual needs. Also, they should spread awareness regarding natural child birth.

🔽 Self-Assessment Questions

5. Nurses' station within the obstetrics department should be located _

- Activity

Visit a nearby obstetrics department and list down five observations.

5.5 **Psychiatric Nursing Unit**

Patients who are affected from acute or chronic mental illness are treated in the psychiatric ward. It is also called the mental ward of the hospital. Some important aspects of the psychiatric nursing unit are described in the following sub-sections.

5.5.1 Functions

The following are the important functions of the psychiatric nursing unit:

• Provide specialised care or treatment, rehabilitation services for patients suffering from psychiatric problems that are really problematic and are of short, medium or long term duration.

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We can divide these patients into the following groups:

- a. Geriatric patients who are suffering from long term psychiatric diseases.
- b. Mentally retarded patients who are not developed according to their age, with psychiatric disorders.
- c. Patients with severely disruptive/aggressive behaviour.
- d. Patients with schizophrenia, who have a suicidal tendency.
- e. Patients who are suffering from chronic schizophrenia and are not acceptable in societies.
- Provide care services as a specialised inpatient unit for other mental health problems.
- Provide services as a support centre for research, evaluation and academic purposes in the fields of mental health.

Goals of Rehabilitation

- To restore patient's physical, sensory and mental abilities that may be lost due to injury, illness or diseases.
- To assist the patient in order to recompense for shortfalls that cannot be reversed medically.
- To help people become independent and to prevent them from losing the ability to function, thus regaining the quality of life.
- To prevent new problems from developing, during early stages of recovery.

5.5.2 Location

The psychiatric wards should be located near to another element of nature that can serve as "positive distractions", i.e., the garden area. Natural environment reduces stress and fatigue and may ease to quick recovery. Besides this, more contact with nature has been identified by doctors as a priority factor in the health care sector. Psychologists may not be in favour of long, echoic corridors because of perceptual distortions experienced by some psychiatric patients.

The isolation rooms should be near and visible from the nursing station; this should be considered while designing a psychiatric ward. It may promote safety and may reduce disturbance. On the other hand, more distance may lessen down environmental distraction, but decrease staff awareness and available staffing resources.

5.5.3 Design

Numerous researches, reports and studies done on psychiatric hospitals or wards suggested that there should be open windows in psychiatric wards. These windows should allow natural light to enter, which, in turn, gives positive environment to healing and also enhances working capacity of the staff. Safety glass should be provided in rooms, which can be opened from inside of the ward to make a positive connection with the outside environment. Spatial flexibility is also included into the design process, which gives maximum use of the available space.

The unit design may give ease to participation and group activities like having sufficient group meeting space, etc. In mental health facilities, technology has given major hands in enhancing communications, security and patient care.

- Security enhancements give consideration on door control, inventory control and facility monitoring.
- Communication enhancements give consideration on continuously updating patient's medical records by all appropriate members of a patient's interdisciplinary care team.

"Telemental health" refers to distant visual/audio communication between patients and healthcare professionals. This technology is crucial for raising awareness about care, particularly for patients residing in remote or rural areas.

5.5.4 Organisation

In an interdisciplinary team setting, mental health treatment facilities are typically shared in psychiatric wards. That is to say, throughout the course of treatment, staff members collaborate and communicate with one another. Members of interdisciplinary treatment teams hail from different fields, but not limited to the traditional branches of mental health care (psychiatry, psychology, social work, and nursing) and others. Among these experts are:

- Psychiatrists
- Psychologists
- Social workers
- Advance practice nurses/nurse practitioners
- Registered nurses
- Licensed practical nurses
- Licensed vocational nurses
- Dieticians
- Vocational rehabilitation specialists
- Rehabilitation technicians
- Recreational therapists
- ♦ Support technicians

5.5.5 Facilities and Space Requirements

There has been a recent trend toward the use of single occupancy rooms in private mental health clinics. All private patient rooms come equipped with amenities that give better care, greater privacy and less disruption to the patient, their family, and staff than semi-private rooms. Because of the increased seclusion and decreased background noise, patient rooms with a single occupancy are preferable.

Family access, "connectedness," and social "engagement" can be greatly affected by the design of a hospital. It is necessary to be familiar with the following areas of a hospital in order to comprehend the effect of the mental inpatient facility's architecture.

The Hospital Entrance

Caregivers typically make initial contact with the hospital at the front desk. It is possible that the caregivers are seeking assistance. Going to a retail mall is nothing like this. A warm and inviting atmosphere can be achieved through well-planned architecture and sufficient signage.

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The Ward Space

Making it into the wards is the next stop on the tour of the hospital. Staff members are keeping a close eye on the newly unlocked wards of acute inpatient mental health care units. Patients and their caregivers are both made to feel inferior in the hospital setting as a result of the safety precautions adopted.

Spaces for Family and Community Living within the Hospital

Family life and community social activities are supported by the hospital's space organisation. Additionally, guests get access to private areas. A café is a great place to meet new people and strike up conversations.

🔁 Self-Assessment Questions

- 7. Dieticians are also part of psychiatric ward organisation structure. (True/False)

5.6 Isolation Rooms

Family life and community social activities are supported by the hospital's space organisation. Additionally, guests get access to private areas. A café is a great place to meet new people and strike up conversations.

The isolation rooms' use of positive and negative air pressures is crucial. Here we will go over these points:

- Negative air pressure: Negative air pressure is occasionally used in isolation wards. This helps keep infectious diseases like the flu and tuberculosis from spreading from person to person. Into the room, air is drawn in by a machine. After that, it takes the air outdoors after filtering it. With a slightly ajar door or window, air is drawn into a negative air pressure chamber.
- **Positive air pressure**: Positive air pressure is utilised when people's immune systems are compromised. Continuously pumped air is what makes a room with positive air pressure. By doing so, the spread of infectious diseases can be reduced. It is possible to sense the movement of air as it exits a room with positive air pressure, even when the door is closed.

5.6.1 Location

The isolation wards can be found at the very end of the corridors in the different nursing units. They need to be competent to handle standard acute care when cases involving seclusion are not imminent. You can create a distinct isolation unit by grouping together isolation rooms. Oftentimes, the personnel alone works in this unit, and it is located far from the main hospital. This unit is located in a different building at certain hospitals.

All acute care patient rooms in isolation wards should feature one bed and all the necessary amenities for patients in isolation. An isolation ward ought to have the following amenities:

- Access to the room should occur via a corridor, workspace, or an entrance equipped for aseptic control, comprising handwashing amenities with a gooseneck spout, gowning facilities, and storage for clean and contaminated materials. These amenities in the workspace are distinct from those in the patient's room. If stringent isolation is anticipated, a vestibule may not suffice; instead, a enclosed ante-room will be required.
- Viewing panels may be provided for observation of the patient by staff from the anteroom.
- One anteroom may serve several isolation rooms.
- There should be a toilet in each isolation room. In addition, there should be bathing and hand washing facilities. These should be arranged so as to permit access from the bed without passing through the anteroom or work area.

5.6.2 Design

Special precaution is to be taken for the designing of isolation rooms in a hospital. One of the goals of the hospital is to prevent nosocomial infection or hospital acquired infection. The main design goal of an isolation room should be to minimise the risk of air contamination from a person suffering from an infectious disease. It is vital to carefully design the isolation rooms to provide a safe environment both to the patients as well as to the health care personnel, who are taking care of them.

Some of the key considerations for designing isolation rooms are as follows:

- Ventilation: This is the most crucial measure that can minimise the average risk of infection in two ways, namely, dilution and removal. In the dilution method, the clean air supplied in the room dilutes the concentration of airborne infections. It reduces the risk that a person in the room will breathe contaminated air. On the other hand, in the removal process, the contaminated air is discharged to the outdoors (only in a safe place) or the contaminated air is filtered through a HEPA filter in order to trap the infections from the air. The filtered air can be then re-circulated in the room, which is free from infections.
- **Pressure difference between rooms:** The isolation room should be carefully maintained at negative pressure with respect to both the surroundings as well as the anteroom. It is preferable to keep the door closed between the anteroom and the room.
- **Negative pressure:** It is created intentionally so that the air containing the infectious particles cannot escape the room. Negative pressure is created by adjusting the ventilation system in such a way that the air exhausted from the room is more than the air supplied in the room. A negative pressure room should be airtight to prevent the pulling of the outside air through cracks or gaps.
- Air change rates: The degree of ventilation is expressed by Air Changes per Hour (also called ACH). It also helps in maintaining the ventilation in accordance with the set standards and recommendations. When the volume of air supplied to a room is equivalent to the volume of the room, then one air change is said to occur. Frequent air exchanges are mandatory to reduce the infection level.
- Air mixing and stagnation: The purpose of an exhaust is to remove the mixture of fresh ventilated air with contaminated air. The effectiveness of the dilution and removal process depends on the degree of mixing. Stagnation is a phenomenon in which a portion of the room retains the infectious particles as a result of faulty dilution and

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removal process. So when clean air is given in the room, there is absolutely no benefit. Special care should be given so that no stagnation happens.

• **Exhaust location:** The proper location of the exhaust outlets as well as the supply pipelines, which directs clean air in the room, is vital to avoid stagnation issues. The exhaust should be located far away from the supply pipeline.

Self-Assessment Questions

- 8. Negative air pressure is used in isolation rooms. (True/False)
- 9. _____ may serve several isolation rooms.

5.7 Intensive Care Units (ICU)

The intensive care unit (ICU) is a highly specialised section of a hospital that is reserved for the care of patients with life-threatening illnesses, injuries, or complications. It is characterised by its specialised layout, personnel, furnishings, equipment, and location. The different ICU is well-known for its team of professionals in medicine, nursing and allied health. Policies, protocols and procedures are clearly established in the intensive care unit. The critical care unit plays a vital role in the hospital's ability to provide high-quality medical treatment.

5.7.1 Functions

Many patients require intensive care under close supervision, with extra nursing care, constant monitoring, and specialised attention from highly skilled medical professionals using cutting-edge equipment to support their important processes.

Intensive care can be divided into the following (classification by Pontopaian 1964):

- Critical care: It is for those patients who are critically ill and need highly skilled nursing care and observation, along with a life saving device or activity (procedure).
- **Intensive care:** It is for those patients who do not require any device, but need considerable nursing care and observation.
- **Moderate care:** It is for those patients who require periodic treatment or observation and instruction (average share of nursing time).
- Ambulatory care: It is for those patients who need less time and a minimal amount of nursing care.

Generally ICU is not recommended for less than 200 bedded hospitals, where routine processes take place and patients can be cured in general wards or emergency wards. But in 1978, hospitals review committee, also known as Sidhu committee, has recommended that each hospital should have an ICU and about 20% admitted patients need intensive care.

5.7.2 Location

Intensive care unit should be easily accessible to the accident and emergency ward/ departments, operation theatre and inpatients areas (Sidhu committee report in 1978). In a single story hospital, the ideal location will be near casualty service or department, recovery room and OPD wards. In a multi-storied building, it should be on the top floor and away from the main traffic of people, noise and pollution. Nowadays, a new factor is seen relevant while choosing the location of the ICU –the availability of space for step down beds. These

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will allow for the transfer of patients who require continued monitoring, strict observation and nursing care at a level less than that provided in the ICU. These will facilitate to reduce overcrowding and a quick turnover in ICU, so that the staff can follow the patient within the step down units.

5.7.3 Facilities and Space Requirements

The ideal layout for an intensive care unit in a brand-new building can take many forms, including cubicles formed by floor-to-ceiling partitions made of rigid or marble, with glass panels of suitable height on either side. This setup allows the nursing staff to see the patient from their centralised position while also creating a visual and auditory barrier between patients lying in adjacent beds. The optimal number of intensive care unit beds is 60% in an open ward and 40% in single-bed cubicles. So that nurses have room to work and heavy emergency equipment can be easily moved, it is recommended that open wards have a minimum size of 150 square feet per bed and isolation cubicles have 225 square feet.

Physical Facilities

The aim of an ICU should be to provide favourable conditions for nursing care and medical care, and enough physical facilities for giving smoothness to the patients, both paramedical and medical or nursing staff.

The following points must be considered at the time of planning an ICU:

- The floor should be terozo-mixed with fine particles of carbon, which can be easily washed. It should be conductive to electricity and resilient to reduce noise due to walking and falling of articles.
- Roof should be painted and rounded off without any projection to avoid dust collection.
- There should be sufficient number of plugs available near each bed to provide electricity to various machines like suction, defibrillators, monitors, etc.
- There should be an extra source for light in case of emergency, which should be automatic in nature.
- Central air conditioning system should be present to cope with extreme weather and to prevent dust. Temperature should be $60^{\circ} 70^{\circ}$ F and humidity should be 50 60%.
- Ventilation there must be minimum 10 air changes per hour to clear droplet nuclei due to sneeze (Kinney – 1964).
- Positive air pressure should be maintained to the air pressure of the corridor or general traffic to prevent passage of contaminated air in the reverse direction. The exhaust fans creating negative pressure in cubicles are not recommended in ICU.
- Cafeteria and refreshment facility for the staff should be there in order to avoid leaving the ward.
- One Medical Officer's room with W.C. should be there.
- One nurses' duty room with W.C. should be there.
- One medical record office room should be there.
- A storage room should be there.
- A side room for bed pans and urinals should be there.

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- Waiting room for relatives with sleeping facility should be provided.
- Rest room for paramedical staff should be there.
- Minor workshop for day-to-day repairmen of equipment should be provided.
- The nurses' duty room should be so strategically placed that they are capable to keep a continuous eye on the patients with the shortest distance.

Staffing

The staff of an ICU can be divided into three categories:

- Medical
- Nursing
- ♦ Class IV personnel

Medical Staff

In 1967, Swedish Board of Health recommended 0.17 to 0.2 doctors per bed in an ICU.

Nursing Staff

Head of the ICU nurse should be selected on the basis of special intensive care experience – with high degree of clinical nursing competence as well as supervisional and teaching skills.

The ideal nurse:bed ratio is 1:1 (one nurse per bed), but it is very unrealistic in countries like India due to a shortage of trained staff and the cost factor. The acceptable ratio depends on various factors, such as medical setup of the unit, type of the patients admitted and the proportion of patients requiring artificial ventilation or other specialised therapies.

Class IV Staff

Class IV staff plays a very important role in keeping the ward clean, and they also do other activities related to patients' care and personal hygiene.

Other Staff

Technical staff, such as physiotherapist, inhalation therapist, electronic technician and biomedical engineering expert and laboratory technician, is required to give necessary technical support to the ICU.

ICU Equipment

Some of the ICU equipment are listed as follows:

- Airway
- Arterial line
- Bedside monitor
- Bi-Level Positive Air Pressure (B/PAP) machine
- Biohazard disposal box
- Blood pressure monitor
- Blood pressure device (sphygmomanometer)
- Blood warmer

- Breathing beg (manual resuscitator)
- Breathing machine (mechanical ventilator)
- Breathing machine tubing
- Breathing tube (endotracheal tube)
- Bronchoscope
- Call Button
- Capnigraphy monitor
- Central venous line or catheter
- Chest drainage device

5.7.4 Code Blue Team and Code Blue Alarm

The term "Code Blue" is typically used to describe a patient who has to be resuscitated or who need urgent medical treatment in any setting, not just patient care areas. This is usually the case when a patient experiences a respiratory or cardiac arrest. For the purpose of notifying the resuscitation team of where to respond, the packet is called "Code Blue, (floor), (room)" and is transmitted overhead. Every hospital has a strategy in place on which unit will supply workers for code coverage as part of its catastrophe plans. In theory, any doctor or nurse can answer a code, but in reality, only those who have completed advanced cardiac life support or a similar programme are authorised to do so.

The following information must be communicated by event happening staff in the case of a Code Blue:

- Sudden heart arrest or other medical emergency;
- Precise address (ward, area, building, and bedding number)
- ♦ Healthcare staff

Code Blue Response Team

Members of the "Code Blue Response Team" are available to handle both medical and policerelated crises. The "Medical Emergency Team" model serves as the basis for this group. The designated Code Blue Response Team will attend to both the clinical and non-clinical sections of any given institution.

People who make up the Code Blue Response Team are:

- Clinical specialist in critical care
- Health records bureau
- Healthcare staff
- Emergency room nurse (ECRN)

Priorities in an Emergency

In the event of an emergency, the personnel are obligated to:

- Assess the situation quickly
- Ensure safety for staff, patient and bystanders.

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- Initiate a response from the patient
- Call for help Code Blue Emergency
- Commence appropriate treatment following the basic life support

General Principles

After ensuring the safety of the patient, staff and bystanders, the management of the collapsed patient involves:

- Prevention of further injury
- Checking response to verbal and tactile stimuli
- Care of airway, breathing and circulation
- Calling for help
- Control of bleeding
- Protection from the environment
- Maintenance of normal body temperature
- Protection of skin and nerves by protection of bony prominences from hard objects
- Reassurance and continued observation of the collapsed patient

🖄 Self-Assessment Questions

- 10. Code blue team works at all the areas of hospital management. (True/False)
- 11. Class IV personal belongs to ICU. (True/False)

5.8 Coronary Care Units (CCUs)

A coronary care unit (CCU) or cardiac intensive care unit (CICU) is a hospital ward dedicated to caring for patients experiencing heart attacks, cardiac dysrhythmia, and various other cardiac/heart conditions demanding ongoing monitoring and treatment.

Coronary care units were first developed in the 1960s. The most important factor of the coronary care is the availability of the staff, doctors and nurses to continuously monitor the cardiac rhythm by electrocardiography. This helps in easily treating a patient at an early stage of any kind of heart or health problems. Coronary care unit is basically for patients with unstable angina and heart block cases. Specially trained staff and medical measures are required in order to avoid any complications of cardiovascular disease. Highly equipped medical tools are available in such units to provide full care, support and comfort to the patients.

There are two types of CCUs, namely, acute coronary care and subacute coronary care. Each of the units plays a crucial role in carrying out the necessary responsibilities. The acute coronary care unit is alternatively referred to as the critical coronary care unit. Patients undergoing open-heart procedures are typically accommodated in this area. Subacute coronary care units (SCCU), also recognized as progressive care units (PCU), offer a standard of care for patients needing cardiac telemetry, including those with unstable angina.

🔽 Self-Assessment Questions

12. CICU stands for_____

5.9 Newborn Nurseries

Newborn nursery provides special care for the new born baby. A mother has specific preferences about her baby's birth experience, and it is the goal of the newborn nursery to fulfil those wishes. Nurses who are specially trained in the care of newborns assist in all possible ways for the new born baby in the room. Lactation specialists are also available in this ward to help mothers in learning to breast-feed.

Let us now discuss some newborn nurseries.

5.9.1 Full-Term Nursery

For full-term or almost full-term babies who are otherwise healthy, it allows for united mother-baby nursing. The newborn's level of care is proportional to his or her age and condition. Holding, full-term and newborn nurseries are terms used interchangeably in the medical literature to describe facilities that offer standard care to babies delivered healthy and with few resuscitative needs.

5.9.2 Observation Nursery

Observation nursery is a relatively new term in which infants are kept in observation rooms for monitoring their growth, analysing any abnormal behaviour, etc. This type of nursery should be located beside the full-term nursery. However, it should be a separate unit. It should have around three to five beds. It should have glazed partition so that the nurses can observe the infants easily. The furniture here should be similar to those in the full-tern nursery.

There should be an anteroom inside, which should be between the nursery and the corridor. It should also contain work areas, treatment areas, sink, counters and cabinets for sterilised gowns and gloves.

5.9.3 Premature Nursery

This type of nursery is being used for keeping the premature infants, that is, babies who are born before their due dates. As a result of the early delivery (less than 37 weeks gestation age), these type of infants are not fully developed and need support for their survival. Premature babies face risk of disabilities, retarded physical and mental growth, etc. Specialised care should be taken for them in the initial days, as soon as they come out of their mother's womb. For this purpose, new age hospitals are coming up with the concept of premature nursery.

Premature nursery should accommodate around five infants. It should ideally be located in the postpartum unit of the labour suite and should be a part of the full-term nursery. The minimum space required for premature nursery is 40 sq. ft. per incubator. Incubators are specialised equipment which provide suitable environment for the premature baby. They provide oxygen supply, observe brain activity, protect the infants from cold/infection, provide them food through catheter, give medications, maintain body fluid balance, etc.

In the premature nursery, appropriate temperature and humidity should be maintained all the time. This unit should have incubators, rocking chair and all the other types of furnishings, which are there in a full-term nursery. The premature pharmacy is a typical feature of super

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speciality large hospitals. In small hospitals where there are budget constraints, it may not be possible to build a premature nursery as they are quite expensive. In those cases, a separate space should be kept in the full-term nursery only for the premature babies.

5.9.4 Utilities

As the department is all about the newborn, special care should be taken in order to ensure that the room is well maintained. The health of the infants should not suffer due to improper maintenance. Special care should be given to the air conditioning, electrical and ventilation services. Air conditioning is vital for maintaining the optimum temperature and humidity conditions suitable for the new born baby. AC reduces dirt and odour, and creates a soothing ambience in the room. The bacterial contamination of the environment is minimised by the ventilation effect. Air conditioning is a great measure to reduce hospital acquired infections. The electrical system should be properly checked to remove any faults and all the wires should be properly insulated. Routine maintenance of the electrical system should meet all the safety standards.

The décor and colour of the nursery should be child friendly. The walls should be painted in baby friendly colours like baby pink/blue with pictures of animals, plants, flowers, etc. All these are done keeping in mind the choices of a child, so that he/she can adapt well to the hospital's environment. Also, toys, educational games, etc., should be made available. The number of baby cots should be directly proportional to the total number of beds and the total number of delivery cases in a given period of time.

🔁 Self-Assessment Questions

In a premature nursery appropriate ______ and _____ should be maintained all the time.

Activity

Visit any new born nursery and write down your observations.

5.10 Summary

- The nurses perform a variety of duties every day. They are very hardworking, caring and efficient assets of a hospital.
- The nursing unit follows a typical organisational hierarchy. The nursing unit is headed by the Nursing Superintendent.
- The paediatric department, unlike the other departments of the hospital, deals with infants and children.
- Obstetrics nursing unit helps in caring for women during pregnancy and childbirth.
- Psychiatric ward is concerned with the treatment of patients affected with acute or chronic mental illness.
- ◆ A coronary care unit (CCU) or cardiac intensive care unit (CICU) is a hospital ward that specialises in taking care of patients with heart attacks, cardiac dysrhythmia and many other cardiac/heart conditions that require continuous monitoring and treatment.

- Isolation ward refers to a separate ward used to isolate patients suffering from infectious diseases in a medical facility. Generally, in an isolation unit several wards for individual patients are placed together.
- Premature nursery is being used for keeping the babies who are born before their due date.

5.11 Glossary

- Geriatric patients: It refers to the elderly patients.
- **Gynaecology:** It refers to the medical practice that deals with the woman reproductive system.
- **Physiotherapy:** It refers to a health care profession that is primarily concerned with remedying impairment and disabilities and promoting mobility, functional ability, quality of life and movement of potential through examination.
- Schizophrenia: It refers to a mental disorder characterised by abnormal social behaviour and failure to recognise what is real.

5.12 Terminal Questions

- 1. What are the functions of nurses?
- 2. Where should an isolation room be located in a hospital?
- 3. Discuss Code Blue Team and Code Blue Alarm?
- 4. What is the role of an ICU in a hospital?
- 5. Define premature nursery.

5.13 Answers

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Q.	Self-Assessment Questions
1.	Nursing superintendent
2.	False
3.	125 sq. ft. for single room
4.	False
5.	Centrally
6.	Mental
7.	True
8.	True
9.	One anteroom
10.	True
11.	True
12.	Cardiac intensive care unit
13.	Temperature and humidity

Notes

Q.	Terminal Questions
1.	The nurses have to perform a variety of functions every day because of which they are considered as very hardworking, caring and efficient assets of a hospital. Refer to sub-section 5.2.1 Functions .
2.	Isolation rooms are generally placed away from the main hospital. Refer to sub- section 5.6.1 Location .
3.	"Code Blue" is generally used to indicate a patient requiring resuscitation or otherwise in need of immediate medical attention. Refer to sub-section 5.7.4 Code Blue Team and Code Blue Alarm .
4.	ICU is a department that deals with critically ill patients, injuries or complications. Refer to section 5.7 Intensive Care Units (ICUs) .
5.	A premature nursery is used for keeping the pre-mature infants, that is, babies who are born before their due dates. Refer to sub-section 5.9.3 Premature Nursery .

5.14 Case Study: Evaluation of Outsourcing in Nursing Services, Kashani Hospital, Isfahan

Background

Most of the services that belong to the core wing of the hospital are in-house managed and outsourcing may lead to failures in certain cases. In contradictory to this, one can say that well-managed supervision can prove to be cost effective and quality oriented by outsourcing services. Sometimes failure helps to identify the problematic area and build a strong base. The purpose of this study is to evaluate nursing services outsourced in a general hospital from various perspectives.

Methods

This case study is done based on the before and after method. In 2011, Kashani hospital outsourced nursing services of clinical wards (ENT and Neurosurgery). The main objective for outsourcing was to cover more beds by the help of nursing services.

Results

Though the objective of increased number of graduated nurses per bed was achieved, but this led to factors like remarkably increased costs per bed, reduction in internal customer satisfaction rate, etc., which was not a good signal for a reputed hospital.

Conclusion

While outsourcing nursing services, the hospital management should bring both staff and patient satisfaction and increase the output ratio, which should be cost effective. The outsourcing should be balanced between different units. Simply outsourcing nursing workforce singly will lead to a loss of efficiency. Therefore, the applied outsourcing wasn't helpful in the productivity of the hospital.

Discussion Questions

1. What are major points that should have been considered by Kashani Hospital management while outsourcing the nursing unit of the hospital?

(**Hint:** The major points that should have been considered include staff satisfaction, patient satisfaction, output ratio, etc.)

2. What was the objective of outsourcing the nursing unit?

(Hint: To cover more beds by the help of nursing services.)

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CHAPTER



Ancillary Services

Structure

6.1	Introduction
	Learning Objectives
6.2	Concept of Ancillary/Supportive Services
6.3	Admitting Department
6.4	Medical Records Department
6.5	Central Sterilisation and Supply Department (CSSD)
6.6	Pharmacy Department
6.7	Food Services/Dietary Department
6.8	Laundry and Linen Service Department
6.9	Housekeeping Department
6.10	Summary
6.11	Glossary
6.12	Terminal Questions
6.13	Answers
6.14	Case Study: Somerset Hospitals Food Service
6.15	References and Suggested Readings

Notes

Learning Objectives

After completing this chapter, you will be able to:

- Discuss the concept of ancillary/supportive services
- □ Explain the roles and responsibilities of the admitting department
- **□** Explain the duties of the medical records department
- Discuss the importance of the central sterilisation and supply department
- $\hfill\square$ Describe the responsibilities of the pharmacy department
- □ Explain the roles and responsibilities of the food service/dietary department
- Discuss the responsibilities of the laundry and linen service department
- $\hfill\square$ Describe the major roles performed by the house keeping department of a hospital

6.1 Introduction

Hospital ancillary services are basically supplemental services that are provided to patients for supporting the diagnosis and medical treatment. These services include home health services, diagnostic services, physical therapy and occupational therapy.

In a hospital, there are various departments such as admitting department, medical records department, central sterilisation and supply department (CSSD), pharmacy department, food service/dietary department and laundry and linen service department that help in providing ancillary services.

The admitting department takes the basic responsibility of admitting, transferring and discharging patients. The medical records department maintains and manages records related to each patient admitted in the hospital. The CSSD is another important department that takes the sole responsibility of processing and sterilising equipment and materials under controlled conditions by experienced professionals.

Apart from these departments, there is the pharmacy department that is considered as one of the highest revenue-generating point of the hospital. It purchases, receives stores, assembles, packages, labels, sells and dispenses pharmaceutical items. Good food is another important aspect that plays an important role in providing total care to the patients. It is the responsibility of the food service department to prepare and serve the best quality food to the patients that could help in enhancing their health condition. In addition, a hospital also consists of the housekeeping department and the laundry and linen service department that help in providing a safe, clean, pleasant, orderly and functional environment to both the patients and hospital staff. This chapter deals with explaining the roles and responsibilities of all these departments in detail.

6.2 Concept of Ancillary/Supportive Services

Ancillary services are basically supplemental health care services that are used to support the diagnosis and treatment of a patient's condition. These services include audiology, durable medical equipment (DME), ambulatory surgical centres (ASC), home infusion, hospice care, skilled nursing facility (SNF), cardiac testing, mobile lithotripsy, fitness centre, radiology, pulmonary testing and dialysis. Without ancillary services, the hospital staff will not be able to function effectively. The medical professionals who provide ancillary support and care are known as ancillary staff, which includes lab technicians, ambulance staff, emergency support staff, etc.

Ancillary services can be classified into three categories, which are described as follows:

- **Diagnostic:** These services are provided to complement physician services within a hospital, ASC, or diagnostic testing centre. For instance, if a physician refers a patient for a blood test, it falls within the realm of diagnostic ancillary service. Diagnostic ancillary services encompass audiology, radiology, pulmonary testing services, and clinical lab services.
- Therapeutic: These services encompass physical therapy, occupational therapy, speech therapy, radiation therapy, and nutrition therapy. For instance, if a physician refers a patient to a physiotherapist for exercises following a leg bone repair, it falls under therapeutic ancillary service. Therapeutic ancillary services can be offered in standalone medical facilities or clinics based within hospitals.
- Custodial: These services centre on hospice, home health, or nursing home care. Essentially, custodial ancillary services provide nonmedical support to assist individuals with their daily activities, the preparation of specialised diets, and the self-administration of medication. Custodial denotes a type of care that can be safely provided by someone without formal medical, nursing, or other professional qualifications. As such, custodial service providers may not necessarily need to undergo medical training.

The purpose of ancillary services at hospitals is basically to provide the necessary support to both doctors and patients, for effective treatment with positive results. As ancillary services are mostly used to diagnose a patient's health status, it is important that the people who are providing these services are medical professionals and the medical equipment that are used for diagnosing are in good working condition to generate correct report. Therefore, ancillary services provide a source for doctors to facilitate a smooth and easy flow of information regarding a patient's medical history. Patients, on the other hand, rely on ancillary services for medical reports, information regarding medical insurance coverage and outside referrals.

🔁 Self-Assessment Questions

- 1. ______ services are basically supplemental health care services that are used to support the diagnosis and treatment of a patient's condition.
- 2. What are the three types of ancillary services?
- **3.** ______ refers to the kind of care that can be securely given by someone without medical, nursing or other professional training.
- 4. Therapeutic ancillary service may be provided in free-standing medical facilities or hospital-based clinics. (True/False)

6.3 Admitting Department

In a hospital, the admitting department is one of the most important and necessary units. The functions of this department revolve around admitting, transferring and discharging patients. Apart from this, in some hospitals, the admitting department also takes care of activities associated with reception work, round-the-clock enquiry and public relations (PR). The admitting department is basically responsible for coordinating with patients at their arrival, registration of medical records, arrangement of initial tests, pre-admission reservation of hospital beds and follow-up of patients' health after their discharge.

The duty of the admitting department is to retrieve all the details and information of the patient who needs to be admitted in the hospital. The data collected during the admission

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process determines the quality of care provided to the patient. In other words, the quality of care depends a lot upon the accurate and apt information that is transferred to the medical staff by the admitting department.

Academic qualification required for an admitting staff in a hospital is usually a high school diploma. However, with the increase of insurance issues, many hospitals prefer hiring candidates with a college degree or even more higher education level. However, the efficiency of the admitting department staff is measured by certain factors, such as waiting time during the admitting process, system of escorting a patient from one department to another or to their rooms and the concern and politeness of the staff. In many cases, the admitting department is the first point of contact of patients with the hospitals. In such cases, the department may establish the patient's first and last impression about the hospital.

The admitting department of any hospital should know how to work in critical situations. It often happens that patients and those accompanying them are in a state of mental stress. In such scenarios, delay and long waiting in admission may put them in emotional trauma. Therefore, there should be minimum delay in completing the procedure regarding a patient's admission. The priority of admission is determined by the degree of urgency that classifies admission cases into three types, which are discussed as follows:

- **Emergency cases:** This type includes cases that require immediate admission of the patient.
- **Urgent cases:** This type includes cases that demand admission as soon as possible or within the time duration of 72 hours.
- Elective cases: This type includes cases where admissions are scheduled in advance, and patients are usually admitted as per their reservations.

The admitting department staff should handle patients with care, consideration and civility. Similarly, during the discharge of patients, the admitting department may provide **a** pleasant experience to them with an efficient working style that includes proper planning of release activities and preparation of bills.

The following are the major functions of the admitting department:

- Admit, transfer and discharge patients
- Co-ordinate with the medical records department to get the medical record of the patient (in case the patient is revisiting the hospital for treatment)

Collect information about the patient that may be needed by various departments for generating appropriate medical record (in case the patient is visiting the hospital for the first time)

- Collect the payment of pre-admission deposit as per the hospital's policy
- Schedule reservation for future admission
- Collect information regarding admission, transfer and discharge of the patient
- Maintain bed index to show the occupancy status of hospital beds for further scheduling and assigning beds for admission
- Prepare patient admission and discharge list
- Arrange pre-admission tests to reduce the actual time needed for completing the admission process

🔁 Self-Assessment Questions

- 5. The ______ department is basically responsible for coordinating with patients at their arrival, registration of medical records, arrangement of initial tests, pre-admission reservation of hospital beds and follow-up of patients' health after their discharge.
- **6.** ______ type of cases includes cases where admissions are scheduled in advance, and patients are usually admitted as per their reservations.

6.4 Medical Records Department

A hospital's medical records department is crucial since it keeps and documents all information pertaining to a patient's care. Filing, indexing and retrieving medical records is the main responsibility of this division. Patients, doctors, and administrators all receive assistance from the medical records department. As already discussed, the reliability of the data recorded in patients' medical records is crucial to the standard of care they get. Thus, it is the fundamental duty of the medical records department to guarantee that all medical records are correctly documented, well organised and readily available to all relevant sections of the hospital.

Keeping accurate medical records is of the biggest importance, therefore let's talk about why that department needs to be vigilant about it. All of a patient's pertinent medical information, including past diagnoses, treatments, and outcomes, is documented in their medical record. In addition to the patient's medical history, these records contain details of any diagnostic tests, procedures and procedures that the patient may have undergone. Hence, a medical record is an exhaustive compilation of all information that the relevant medical staff might find useful. The standardisation of medical procedures and the facilitation of easy access to all relevant information are both facilitated by these records.

All of the following should be present in a patient's medical record in an ideal state:

- Patient identification (name, address, gender, age, etc.).
- Medical conditions suffered in the past together with specific symptoms, age at which they occured, duration of illness, etc.
- Treatments received in the past, including any surgical or non-surgical procedures, duration of those treatments, specific points captured through those treatments, etc.
- Body areas that have previously undergone services or treatments, together with any
 particular information regarding the materials utilised
- Any existing health issues, including but not limited to allergies, aches, prescriptions, etc.

In order for medical professionals to organise and administer therapy in the most effective way, medical records include a comprehensive remedial history of a patient.

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6.4.1 Functions of the Medical Records Department

It is the duty of the medical records department to carry out the following tasks:

- Fill out a medical record form or sheet with all pertinent medical information
- Put all the data you've collected into the prescribed format
- As stated in the hospital policy, keep records for a set amount of time
- As needed for treatment, retrieve and provide pertinent medical records of any patient, present or former (within the time specified above)
- Notify those who need to know about the patients by sending them vital records like birth and death certificates
- Process and furnish discharge and registration paperwork
- Manage all interactions with institutions (insurance companies, legal departments, etc.) and any medico-legal concerns pertaining to the admission or release of patients
- Update records through performing, maintaining, and evaluating statistical computations

So, everything having to do with a patient's medical records is handled by the medical records department. All of a patient's vital records, whether for immediate or future use, are readily available to the medical team in this way.

6.4.2 Medical Coding

A patient's medical records contain an exhaustive account of their health history, as previously mentioned. Medical records should contain all relevant information; nevertheless, reading through the entire paper can be a tedious ordeal. On top of that, sorting through medical records is not always easy. On top of that, many diagnosticians may have diverse interpretations of the same data. Consequently, the medical records department increasingly depends on the medical coding system to save time and boost the efficiency of medical services.

A medical coding system is a system that assigns a unique set of alphanumeric codes to each medical ailment and its associated symptoms. The attending staff can more accurately interpret the conditions with the help of these condition-specific alphanumeric codes.

According to the International Statistical Classification of Diseases, medical coding is built upon (commonly known as ICD-10). Injuries and physical illnesses typically use this code. The International Classification of Procedures in Medicine is used to code internal diseases and surgeries (ICPM). Although medical coding follows a complex system, its significance is indisputable due to the multiple critical roles it carries out. Here are a few key points about the medical coding system:

- By using a single alphanumeric code, medical coding helps to consolidate and collect information about a patient's condition, symptoms and treatments.
- Medical conditions are represented by these codes using a common language. Because of this, hospitals and patients that go from all over the world for treatment can better comprehend one other's ailments and receive more effective therapy.

- Data interpretation is facilitated by the distinctive coding system. The coding system ensures consistency in interpretation, which is important in medical science since different people can arrive at different conclusions from the same data.
- Government medical authorities also look at these codes to see how the population is doing at any particular moment in time. By evaluating these codes instead of the full medical record, we can obtain a better picture of the health status of any population at all moment.

6.4.3 Retention of Medical Records

The medical history and treatments of an individual are documented in great detail in their medical records. This data is usually important and secret. All the medical records of people who visit a hospital would be impossible to keep. Therefore, due to their sensitive nature, these records are kept for a predetermined period of time before being deleted in accordance with hospital policy.

No national or centralised policy governs the retention of medical records. This choice is made at the discretion of each individual hospital or medical organisation. In most circumstances, the retention period for general records is 3 years. However, documents pertaining to surgeries may be kept for up to 10 years, and records pertaining to pregnancies can be kept for up to 25 years. Here are some variables that hospitals consider when deciding how long to keep patients' medical records:

- Chances or length after which a patient might be readmitted.
- Describe the medical condition. For extended periods of time, hospitals will most likely keep medical records of patients with uncommon illnesses.
- Thank you for the healthcare staff's time and research. In most cases, the records need to be kept for a longer period if a patient underwent considerable research.
- How much it will cost to investigate the patient's symptoms. For reasons that aren't always related to health, it's necessary to keep records of expensive operations for a longer period of time.
- A record's retention term can be governed by legal requirements as well.
- Possibility of archiving data in hybrid formats. There are a variety of media options for archiving medical records, including paper files, CDs, DVDs, films, etc. Another factor that might influence how long documents are kept is the cost of these alternative retention strategies.
- Record deletion: practicality and expense.

All of these things have an impact on how long a medical organisation keeps patient records.

6.4.4 Destruction of Records

As mentioned earlier, there is no standardised duration for retaining medical records, and after the standard time decided by the hospital, medical records are often destroyed. However,

Notes

in some parts of the world, it is mandatory for hospitals to retain some basic information of all of its patients permanently. This basic information includes:

- Patient's name, date of birth, age, sex, etc.
- Date of admission and discharge
- Condition and the treatment given, including any surgical procedures
- Name of the doctor who has attended the patient

Destruction of medical records is governed by a standard policy of the hospital. The guidelines of this policy pertain to all and any kinds of records held in the hospital such as:

- Paper records
- ♦ X-ray films
- ♦ Lab reports
- Audio tapes
- Electronic records

In case a part of a patient's documents are destroyed while others are retained, it is important to mention as a note the kind and details of the documents destroyed for future reference. Such documents are destructed by burning. It is important that the medical records officer or clerk in charge supervises this step to ensure complete destruction of documents.

Self-Assessment Questions

- 7. The ______ department is one of the most important departments in a hospital that maintains and documents all records related to patient care.
- 8. Define the medical coding system.
- As per the hospital policy, medical records are retained for a standard amount of time, after which they shall be destroyed, pertaining to their confidential nature. (True/False)

6.5 Central Sterilisation and Supply Department (CSSD)

Central Sterilisation and Supply Department (CSSD) is one of the most important departments in a hospital. As it is inevitable for hospitals to escape from being exposed to infectious substances, it is their responsibility to ensure a sterile environment. This is one behemoth task that is handled by the CSSD.

CSSD is responsible for a regular sterilisation of all hospital equipment and their timely supply to all departments as per the requirement. This highly specialised department ensures maintaining the highest required standards of sterilisation. The main objective of the CSSD is to ensure that every reusable piece of medical instruments is sterilised from any infectious matter.

6.5.1 Objectives of the CSSD

As discussed above, the CSSD performs one of the most important functions pertaining to a hospital, i.e., sterilisation and the supply of sterile equipment. However, this broad category includes several tasks to ensure a complete and systematic sterilisation of all equipment. It is

important that the CSSD meets all its stated objectives for a smooth functioning of a hospital. The objectives of the CSSD include:

- Ensuring a safe environment for patients and staff
- Maintaining the safe environment through regular checks
- Supporting other departments in achieving the desired levels of safety within their premises

6.5.2 Functions of the CSSD

The major functions performed by the CSSD are listed as follows:

- Sterilise all reusable equipment, including surgical instruments; diagnostic instruments; lab ware; materials of patient use, such as bedpans and urinals; etc.
- Ensure a timely and unrestricted supply of the sterilised equipment
- Support the nursing staff in the sterilisation and maintenance of equipment for easy access to medical personnel
- Maintain records regarding the sterilisation routine
- Supervise the sterilisation process to ensure that a standard level of sterilisation is done for all the instruments and equipment
- Maintain a record of the available supplies and future requirements
- Ensure a safe and sterile environment for all the patients and working staff
- Store sterilised equipment in such a manner that ensures a safe environment for the patients and staff

6.5.3 Location and Design of the CSSD

Being a sensitive and vulnerable part of a hospital, it is important to carefully select, plan and design the location and layout of the CSSD. One of the most important things that should be considered while designing the CSSD is that there should not be any mixing of sterilised and unsterilised equipment inside the CSSD. This can be done by following a unidirectional flow of materials inside the CSSD. The CSSD is made up of four major parts, namely, the receiving area, the dissemination area, the sterilisation area and the sterile storage and assembly area. It is important that a unidirectional flow is maintained from the first to the last part of the CSSD.

To achieve this, the layout and design of the CSSD should include the following areas:

- Entrance and receipt area: This is the section of the CSSD where materials to be sterilised are received from all over the hospital. In other words, it is the receiving and dissemination area, where materials are received and disassembled (if there is a need) for sterilisation.
- Cleaning area: This is the actual area in the CSSD where sterilisation is carried out. Here, several units are put together to deal with different kinds of materials that are needed to be sterilised. Within this area, a demarcation may exist depending on the kind of materials to be disinfected. For example, surgical instruments might be sterilised separately from materials such as bedpans, urinals, patient linen, etc.

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• Assembly and storage area: After each equipment has undergone the requisite sterilisation treatment, it is put together (where needed) and stored until further use. It is important to ensure that no kind of infectious material comes in contact with this area.

The layout and designing of the CSSD should be such that it ensures a unidirectional flow of materials. In other words, in the CSSD, the movement of equipment that need to be sterilised should always be from front to back.

6.5.4 Facilities and Space Requirements of the CSSD

CSSD is one department that often requires a lot of specialised equipment and facilities for sterilising equipment. Besides constantly ensuring that there is no cross flow of sterilised and unsterilised materials at any point, it is also important to ensure that all the objectives of the CSSD are met in all cases. The CSSD usually consists of facilities such as steam sterilisers, washers and disinfectors, heat sealing machines, ultrasonic cleaners, etc. Steam sterilisation has been recognised as one of the most effective physical means of sterilisation that are used for sterilising equipment such as surgical instruments, diagnostic equipment, etc.

Washers and disinfectors are used for sterilising other materials such as bedpans, urinals, etc. These washers are usually capable of handling everything from pre-rinsing to washing and cleaning to post-wash rinsing and drying. They can be semi to fully automatic machineries that require minimal human intervention, reducing the scope of transmission or loss of sterilisation.

Ultrasonic cleaners are one of the high-end equipment in the CSSD that are used for sterilising equipment or materials that are too sensitive for water or high-temperature cleansing. These cleaners work by sending out ultrasonic impulses to the material that help in killing any germs or infectious matter. Hot sealing machines help in the packaging of sterilised equipment in clean sterile plastic packages. All this is done in an aseptic environment to ensure that there is no transmission of germs.

Considering the specific requirement of the CSSD to maintain a unidirectional flow of everything at any given time, it is important that there is enough space to do so. Also, equipment used in the CSSD are often very large in sizes and therefore, require more space for their easy accommodation and use. Thus, it is important to allocate enough floor space for the CSSD.

Self-Assessment Questions

- **10.** ______ is responsible for a regular sterilisation of all hospital equipment and their timely supply to all departments as per the requirement.
- There is no harm in mixing of sterilised and unsterilised equipment inside the CSSD. (True/False)
- **12.** What are the three major areas that should be considered while planning the layout and design of the CSSD?
- **13.** ______ are used for sterilising equipment or materials that are too sensitive for water or high-temperature cleansing.

6.6 Pharmacy Department

Organisations such as hospitals have several smaller units that provide integral support to them. Hospital pharmacy department is one of such entities that help in ensuring that the entire functioning of a hospital continues smoothly.

A hospital pharmacy can be defined as a department that provides easy access to correct medicines and medical equipment required by the patients and medical staff. It basically focuses on meeting the following objectives:

- Providing easy access to accurate medication
- Ensuring safe and effective use of medicines and medical services in hospitals
- Maintaining the highest possible standards in the field of pharmacy by providing medical services along with the services of qualified pharmacists
- Promoting pharmaceutical research in hospitals
- Allowing accurate and effective extension of pharmaceutical information

6.6.1 Functions of the Pharmacy Department

Hospital pharmacy is one of the multifaceted entities of a hospital that performs various functions pertaining to research, education, medical services, etc. Broadly, functions of a hospital pharmacy can be classified into three categories, which are discussed as follows:

- Administrative: The hospital pharmacy requires looking after the administrative aspect of pharmacy within itself as well as other departments. This category of functions includes:
 - Ensuring availability of correct and trained staff
 - Coordinating with other departments
 - Maintaining requisite documents and records
 - O Developing pharmacy policies
 - Supervising departmental staff and its functioning
 - Maintaining drug inventories
 - Purchasing new orders as and when required
 - Coordinating and performing research for the improvement of existing drugs
 - Working on the development of new and/or better drugs
- Educational: Under this category of functions, hospital pharmacy as a department provides educational services, research-related work and trainings to staff and other personnel. Other functions include:
 - Coordinating for all research-related works
 - Organising and coordinating training sessions for all graduate and undergraduate pharmacy students
 - Providing training to the newly employed staff
 - Organising or liaising to arrange conferences, educational seminars or researchrelated meetings

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- **Medical services:** This is the major function performed by the pharmacy department. The functions under this category include:
 - Dealing with in-house patients to provide the correct and timely medication
 - Providing correct prescription and drugs to out-house patients
 - Ensuring the supply of correct special medications such as intravenous fluids to various departments
 - Performing timely and revising procedures for examining various drugs
 - Recruiting new pharmaceutical employees
 - Ensuring a sterile environment in and around the pharmacy and drugs department
 - Preparing aseptic solutions to be used in all parts of hospitals
 - Coordinating with different vendors for the supply of drugs

6.6.2 Types of Pharmacy

Hospital pharmacy can be classified into two broad groups, which are described as follows:

- **In-patient pharmacy:** These pharmacies essentially deal with the medication requirements of patients admitted in the hospitals. In-patient pharmacies are equipped with handling everything from generic medication to specialised drugs that might be needed. Such pharmacies are more likely to exist in big hospitals where traffic from inhouse patients is large enough to lead to a need for the same.
- **Out-patient pharmacy:** As the name suggests, such pharmacies basically provide prescription and drugs for the patients who are not admitted in the hospital.

6.6.3 Facilities Required by a Pharmacy

As understood from above, a hospital pharmacy performs some of the very important functions to ensure a smooth functioning of a hospital. Therefore, it is important that the following facilities are made available within the pharmacy department:

- **Storage area:** There should be a separate area for the storage of all the medication. The area should be well ventilated and sufficiently illuminated.
- Patient consultation area: Several out-house patient pharmacies provide consultation to the patients before giving them the medication. In such a case, suitable waiting and consultation area for the patients must be available.
- Office and meeting space: As pharmacy department also performs administrative functions, it is important that ample office space is available with sufficient sitting space, lighting and furniture.
- **Technology for information access and storage:** Pharmacies must have access to reliable technological aids that can help them in performing various administrative, medical or educational functions. Besides, pharmacists also require access to accurate and reliable lab automated systems such as calibrators, desiccators, scales, etc.

6.6.4 Hospital Formulary

A hospital formulary is a system of compilation and comparison of all the information on drugs. This system allows the pharmaceutical staff to assess, certify, scrutinise and select drugs of most relevance. Hospital formulary also keeps a check on the inventory of drugs that helps in constantly updating it. This allows removal of any redundant drugs while ensuring that the selected drugs are available in the pharmacy at all given times.

A hospital formulary allows a smooth and efficient functioning of a pharmacy. It helps in not only ensuring the availability of drugs that are of most relevance but also promoting educational and research based aspects to provide an accurate account of available drugs.

🔁 Self-Assessment Questions

- **14.** A hospital ______ provides easy access to correct medicines and medical equipment required by the patients and medical staff.
- 15. What are the two major types of hospital pharmacy?
- **16.** A hospital ______ is a system that allows the pharmaceutical staff to assess, certify, scrutinise and select drugs of most relevance.

6.7 Food Services/Dietary Department

Dietary department is an important support service and healthcare setup. In this department, trained cooks prepare food as per the special dietary needs of patients. At the same time, food for visitors, staff and patient's attendants is also prepared. This department is headed by a qualified dietician who guides the staff (cooks) and patients regarding nutrition and balanced diet.

The dietary department should be headed by a qualified, experienced and trained dietician. The head of the department takes rounds both in inpatient area as well as kitchen to guide junior dieticians for each patient and staff regarding the quality and taste of the food. Depending upon the healthcare setup size, the hospital should have a dietician, kitchen employees, secretary and other helpers (The number of the dietary department staff may usually vary from 10–30). The staff members take care of the preparation of food, taste of the food, timely distribution, cleanliness of the kitchen and utensils, temperature of the food as per requirements, thefts, pilferage and wastage.

6.7.1 Design and Layout of the Dietary Department

The design and layout of the dietary department depends upon the size of facility; number of beds; number of meals to be served per day; centralised or decentralised setup for visitors, staff and patients and the level of machines to be used for the preparation of food. Floors and walls of the kitchen should be such that they can be easily cleaned. Starting with the location of the department, it should ideally be on the ground floor with lifts/elevators nearby. Space may vary between 15–20 sq.m for hospitals with the bed strength of 50–100 beds.

Layout of the kitchen is always designed in such a manner that avoids traffic and mess in the kitchen. It starts from the receipt, inspection and storage of raw material. There should be different storage areas for storing dry and wet items. The preparation area includes cooking area, service area, dish washing area and record room for the staff. There should be a

Notes

designated area to prepare therapeutic diets. Adequate supply of power and water for cooking and cleaning, good ventilation and pest control are also some of the important requirements for the kitchen.

Self-Assessment Questions

- In the ______ department, trained cooks prepare food as per the special dietary needs of patients.
- 18. What is the responsibility of the staff members of the dietary department?

Activity

Visit a nearby hospital. Take note of the design, layout and functioning of the dietary department.

6.8 Laundry and Linen Service Department

The laundry and linen service in a hospital plays a vital role in maintaining a clean and hygienic environment. Hygiene has always been a very important and most cared factor in hospitals and health care centres. The prime focus in the laundry and linen department should be on the cleanliness and freshness of the laundry, such as clothes, bed sheets, pillow covers, etc.

The laundry department can simply be defined as a unit that provides clean and fresh linen to all the departments of a hospital. This unit also maintains a record of the standard of cleanliness and the total turnover. In addition, it updates new developments and methods to provide a better and cost-effective patient care.

The laundry and linen service department usually depends on its in-house cleaning team. The term 'in-house' means that the hospital does not outsource the cleaning or laundry services. The staff of the laundry and linen service department works hard to maintain a clean and healthy environment.

Nowadays, hospitals prefer to go for outsourced employees, as it is cost effective. The outsourced companies not only provide cleaning services but also indulge in services like construction, maintenance, etc. In addition, the quality of service is also high, as professional are hired for the job.

It is the responsibility of the supervisors in the laundry department to instruct the staff for cleaning and distribute tasks clearly and orderly. Any kind of misguidance can be harmful for the patient's health. Several types of dirty laundry or linen are dealt with care and precautions. Bleaching, shampooing, stain removing, etc. are all a part of the laundry department's working process.

🔁 Self-Assessment Questions

19. The ______ department can simply be defined as a unit that provides clean and fresh linen to all the departments of a hospital.

6.9 Housekeeping Department

One of the major departments in a healthcare centre or hospital is the housekeeping unit. A good housekeeping can be an asset for any hospital, as it can add value to the prestige and

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reputation of a hospital. In recent years, the quality and standards of housekeeping have increased rapidly with the introduction of various advanced equipment and tools.

The housekeeping department can be defined as a unit that provides a safe, clean and functional environment for both patients and hospital officials. The main function of this department is to maintain a high standard of infection-free environment. In a hospital, it is very important that certain hygiene standards are followed strictly, as a clean, fresh and hygienic environment leaves a positive and healthy effect on patients.

🔁 Self-Assessment Questions 🗋

20 The ______ department can be defined as a unit that provides a safe, clean and functional environment for both patients and hospital officials.

6.10 Summary

- Hospital ancillary services are basically supplemental services that are provided to patients for supporting the diagnosis and medical treatment.
- In a hospital, the admitting department is one of the most important and necessary units. The functions of this department revolve around admitting, transferring and discharging patients.
- The medical records department is one of the most important departments in a hospital that maintains and documents all records related to patient care. The major function of this department is to file, index and retrieve medical records.
- Medical coding or medical coding system refers to an arrangement of specific alphanumeric codes that are given to a particular medical condition with a given set of symptoms.
- Retention and destruction of medical records are governed by a standard policy of the hospital.
- CSSD is responsible for a regular sterilisation of all hospital equipment and their timely supply to all departments as per the requirement.
- A hospital pharmacy can be defined as a department that provides easy access to correct medicines and medical equipment required by the patients and medical staff.
- A hospital formulary is a system of compilation and comparison of all the information on drugs. This system allows the pharmaceutical staff to assess, certify, scrutinise and select drugs of most relevance.
- Dietary department is an important support service and healthcare setup. In this department, trained cooks prepare food as per the special dietary needs of patients.
- The laundry department can simply be defined as a unit that provides clean and fresh linen to all the departments of a hospital.
- The housekeeping department can be defined as a unit that provides a safe, clean and functional environment for both patients and hospital officials.

6.11 Glossary

• Elective admission: It is a type of admitting processes where the admission of the patient depends on the doctor's permission or patient's willingness to get admitted.

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- **Hospital formulary:** It is a system of compilation and comparison of all the information on drugs.
- **Medical coding:** It refers to the system where specific alphanumeric codes are given to a particular medical condition with a given set of symptoms.

6.12 Terminal Questions

- 1. Discuss the concept of hospital ancillary services.
- 2. What are the three categories of hospital ancillary services?
- 3. Describe the basic functions of the medical records department.
- 4. Discuss the significance of CSSD.
- 5. Explain the role of a hospital pharmacy.
- 6. What is the significance of the dietary department in a hospital?

6.13	Answers
Q.	Self-Assessment Questions
1.	Ancillary
2.	Ancillary services can be classified into three categories: diagnostic, therapeutic and custodial.
3.	Custodial
4.	True
5.	Admitting
6.	Elective
7.	Medical records
8.	Medical coding system refers to an arrangement of specific alphanumeric codes that are given to a particular medical condition with a given set of symptoms.
9.	True
10.	Central Sterilisation and Supply Department (CSSD)
11.	False
12.	The layout and design of the CSSD should include entrance and receipt area, cleaning area and assembly and storage area.
13.	Ultrasonic cleaners
14.	Pharmacy
15.	Hospital pharmacy can be classified into two broad groups: in-patient pharmacy and out-patient pharmacy.
16.	Formulary
17.	Dietary

Notes

18.	The staff members of the dietary department take care of the preparation and taste of food, timely distribution, cleanliness of the kitchen and utensils, temperature of the food as per requirements, thefts, pilferage and wastage.
19.	Laundry
20.	Housekeeping
Q.	Terminal Questions
1.	Hospital ancillary services are basically supplemental services that are provided to patients for supporting the diagnosis and medical treatment. Refer to section 6.2 Concept of Ancillary/Supportive Services .
2.	Ancillary services can be classified into three categories: diagnostic, therapeutic and custodial. Refer to section 6.2 Concept of Ancillary/Supportive Services .
3.	The major function of the medical records department is to file, index and retrieve medical records. Refer to sub-section 6.4.1 Functions of the Medical Records Department.
4.	CSSD is responsible for a regular sterilisation of all hospital equipment and their timely supply to all departments as per the requirement. Refer to section 6.5 Central Sterilisation and Supply Department (CSSD) .
5.	A hospital pharmacy can be defined as a department that provides easy access to correct medicines and medical equipment required by the patients and medical staff. Refer to section 6.6 Pharmacy Department .
6.	Dietary department is an important support service and healthcare setup. In this department, trained cooks prepare food as per the special dietary needs of patients. Refer to section 6.7 Food Services/Dietary Department .

6.14 Case Study: Somerset Hospitals Food Service

Chard, Crewkerne and South Petherton hospitals are among those in Somerset whose administrators have pledged to follow new government guidelines about the food they serve. Musgrove Park Hospital in Taunton has established a new health department to establish high standards for food served in the hospital and to encourage a healthy diet among hospital personnel and patients.

Half of all desserts should be fruit, potatoes, rice and vegetables should be cooked without salt, and you should serve fish twice a week, according to the recommendations. *"We want to see as many people as possible sampling the cuisine to get their thoughts so that we can truly find out what they think of our hospital food and how we can improve it,"* said Philip Shelley, the hospital's Facilities Manager. Our raw meat, milk and veggies come from nearby suppliers since we believe in making the most of what is available to us. In addition to our traditional fare, we have expanded our menu to include pasta and spicy meals in response to customers' requests for lighter fare. Our ability to maintain adequate nutrition and hydration depends on our ability to collaborate with patients and their loved ones.

Community hospitals, such as Chard Crewkerne and South Petherton, are also subject to the standards, according to Paul Courtney, who is a representative of the NHS Somerset Clinical Commissioning Group. *"It applies to hospital meals worldwide so they will all have to guarantee their food is meeting the criteria,"* he added.

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Yeovil District Hospital, according to a hospital representative, views the provision of high-quality, nourishing meals as an integral aspect of the patient's recovery and overall experience. According to him, patients are given greater freedom and choice when it comes to what they eat before each meal. iPads are used to collect orders, which helps with accuracy and cuts down on food waste. Outside of the wards, our on-site restaurant has undergone a recent renovation with an emphasis on providing hot dishes that are created to order, as well as healthy selections, a wide selection of beverages, and snacks, and, if possible, we support local producers.

There will soon be a fruit and vegetable stand set up close to the main door. The spokeswoman mentioned that it will be open twice a week. A hospital's food quality and variety, the availability of healthy snacks between meals, the pricing of meals, the approval of the hospital's menu by a dietitian, and the variety of breakfast options are all factors that will be evaluated under the new rules.

(Source: http://www.yeovilexpress.co.uk/news/11461235.Somerset_hospitals_ensuring_food_is_top_notch/?ref=mr)

Discussion Questions

1. With reference to the given case study, discuss the need of a properly planned and administered food service department in a hospital.

(**Hint:** Properly planned and administered food service department provides the best quality food at a cost consistent with the hospital's policy.)

2. What strategy is followed by the Yeovil District Hospital to reduce potential food waste?

(**Hint:** To reduce potential food waste, the Yeovil District Hospital offers patients to make their food choices prior to each meal in order to give them more choice and flexibility.)

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CHAPTER



Auxiliary Services

Structure

- 7.1 Introduction
- Learning Objectives
- 7.2 Concept of Auxiliary Services
- 7.3 Public Relation Department
- 7.4 Welfare and Religious Services
- 7.5 Hospital Safety and Security Management
- 7.6 Management of Hospital Parking Problems
- 7.7 Patient Access Services
- 7.8 Hospital Transport Services
- 7.9 IT and Telemedicine Services
- 7.10 Summary
- 7.11 Glossary
- 7.12 Terminal Questions
- 7.13 Answers
- 7.14 Case Study: Canberra Hospital Auxiliary Services
- 7.15 References and Suggested Readings

Notes

Learning Objectives

After completing the chapter, you will be able to:

- Explain the concept of auxiliary services
- $\hfill\square$ Discuss the services offered by hospital's public relation department
- Describe the welfare and religious services provided by hospitals
- □ Discuss the hospital safety and security management services
- **D** Explain the management of hospital parking problems
- Explain the need for patient access services
- Discuss the functions of hospital transport services
- **□** Explain the need for IT and telemedicine services

7.1 Introduction

In the previous chapter, you have studied about the ancillary services provided by hospitals. In this chapter, you will study about the auxiliary services provided by hospitals. Auxiliary services refer to the additional or complementary services provided by an organisation in addition to the core services to support and serve its clients. A hospital consists of five broad components which are as follows:

- Clinical services to provide medical care to patients.
- Nursing services to provide nursing care to patients.
- Professional or diagnostic services such as pathological laboratory and radiology services.
- Ancillary services such as laundry, housekeeping, dietary assistance, etc.
- Auxiliary services such as public relations, welfare services, security arrangements, supplies, transport facilities, etc.

Now, several hospitals and healthcare communities have realised that providing medical aid alone is not always sufficient for the recovery of the chronically ill patients. Patients recovery may be accelerated through the inclusion of an array of support services after meeting their primary medical needs. Auxiliary services are mainly concerned with medicare services provided by a hospital. These are aimed at improving the level of hospital services in all concerned areas. Hospital services can mainly be improved through additional services in areas such as medical education, training and research, rehabilitation of patients, physiotherapy, etc. Often people unite together to volunteer for the welfare of patients by providing them auxiliary services such as home care, transportation, free medicines, etc.

In this chapter, you will study about the concept of auxiliary services and the various types of auxiliary services provided by hospitals including public relation services, welfare and religious services, hospital safety and security management, hospital parking management, patient access services, hospital transport services, and the services related to information technology (IT) and health telemedicine.

7.2 Concept of Auxiliary Services

Auxiliary services are additional or complementary services provided by an organisation in addition to the core services to support and serve its clients. In order to improve the level of

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services provided by a hospital, certain additional services are offered to patients apart from the immediate medical care. This is done to provide support and care to patients beyond the primary medical aids. Hospitals are now paying attention to the fact that medical services alone cannot help in healing a patient completely and in the minimum possible time. To achieve higher service levels, hospitals and volunteer organisations provide patients with auxiliary services. These auxiliary services include registration and indoors case records, store management, transportation management, mortuary arrangement, dietary services to patients, maintenance service, etc.

In a hospital, the security arrangements, supplies, transport facilities are of paramount importance and ignoring these would mean increasing patients' inconvenience. For example, hospital registration is imperative to collect hospital statistics including the details of admission, discharge and average stay of patients in the hospital. Similarly, hospitals need to have different storage areas for stocking various hospital items.

Some common auxiliary services include carrying supplies and patients through trolleys, wheelchairs and stretchers, managing cold storage or mortuary where the dead bodies are preserved until claimed by relatives, managing the dietary department to ensure that patients are provided with an appropriate and nutritious diet, managing the security system. All these services provided by hospitals in addition to primary clinical care are grouped under the umbrella of hospital auxiliary services. Some auxiliary services provided by hospitals are as follows:

- Rehabilitation centres
- Physiotherapy
- Occupational therapy to help patients to return home after chronic ailments
- Speech therapy

Some of the volunteer auxiliary services are as follows:

- Community education
- Emergency department
- Environmental services
- Information desks
- Marketing and community relations
- Maintaining medical records
- Nutritional services
- Patient care

In the next sections, you will study about some of the most common auxiliary services provided by hospitals in detail.

Self-Assessment Questions

- **1.** ______ are additional or complementary services provided by an organisation in addition to the core services to support and serve its clients.
- 2. Hospital security is an auxiliary service provided by hospitals. (True/False)

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7.3 Public Relations Department

In every service industry including banking, health care, hotels and hospitality, travel and tourism, media & entertainment, etc., Public Relations (PR) plays a very significant role. Public Relations activities involve planned promotion of goods or services offered by organisations in order to earn goodwill. Therefore, having a PR department is a common practice followed by most organisations. Organisations that do not have their own PR departments usually hire PR agencies to assist them in the PR activities. Public relations involve continuous activities to evaluate the attitudes of the prospective clients, develop relations for mutual cooperation and are aimed at gaining the respect and trust of the target people in order to establish a positive image. Hospitals are among the leading organisations offering services to public. Nowadays, there is an increased competition between healthcare institutions. Thus, the impressions and effects that the hospitals have on the prospective clients are significant for the survival of these hospitals. Encouraging positive images of these hospitals could be accomplished through effective public relations services. Let us discuss the role and importance of PR in hospitals. The main factors responsible for the development of PR departments in the health sector are shown in Fig. 7.1:



Fig. 7.1: Factors for Development of PR Departments in Health Sector

There are certain other factors like improvement in the patient rights, right to information, improved mass media, increased competition and the increase in the number of private hospitals have also contributed to the same.

7.3.1 PR: Role and Importance

The basic role of a hospital's PR is to assist both internal and external departments responsible for the growth and promotion of the hospital. Managing the overall information of the hospital as well as community-related information is another function of the PR department. A PR manager in a hospital keeps an accurate report and information of the hospital management at all levels. A breakdown of his/her responsibilities is as follows:

- 1. Writing and disseminating promotional news via media print, electronic or digital
- 2. Discussing and defining the hospital's policy changes and new policies with public opinion as base

- **3.** Planning strategies or setting goals to attain the level of understanding with the public, which is necessary to any organisation that strives to succeed
- 4. Marketing, budgeting, developing facilities after the current market, etc.

Apart from this, the PR department of a hospital is also responsible for hospital publications and special events aimed at fund raising for the hospital. A Public Relations officer understands a patient's need according to the details provided by the patient. However, the information shared by a patient should be kept as confidential and private.

A Public Relations person in the healthcare sector is required to be effective in communication and accurate about the ideas or policies to be implemented. In a Public Relations department, a patient's medical history, personal details, etc., must be kept in proper order and securely. The PR officer must have a problem-solving ability. Profit and non-profit aspects of how the hospital operates is also a part of the PR department

7.3.2 Different Types of PR Services

There are various roles of a PR professional in a hospital. He/she helps with the crisis management within the hospital. Suppose a surgery is delayed in a hospital resulting in the death of the patient. On such a mishap, which could easily taint the hospital's image, the PR personnel decide the course of action that the hospital should take in order to repair the damage done. The PR department also communicates to the displeased relatives and people of how the hospital is dealing with the situation. Some of the PR services provided by a PR consultant are as follows:

- **Direct communication:** Communicating with groups using methods such as newsletters, events, and public speaking. A PR consultant helps in promoting the services provided by a hospital. Communication is one of the most effective ways to create awareness among the public.
- **Direct marketing:** Targeting groups by advertising, direct mail, and sponsorship are some of the direct methods of publicity. A PR consultant in a hospital can use media to advertise the standard and quality of services provided by the hospital.
- **Internal communication:** A PR consultant helps in developing strategies for internal communications which are implemented by the hospital staff for better operation.

The aim of the Public Relations department of a hospital is to inform the key executives of the needs of other hospital departments and influence local or national policies which may affect the hospital. PR personnel should maintain a record of all the necessary details and documents of the patients visiting or admitted in the hospital.

🔁 Self-Assessment Questions

- 3. Organisations that do not have their own PR departments usually hire PR agencies to assist them in the PR activities. (True/False)
- 4. _____ in a hospital keeps an accurate report and information of the hospital management at all levels.

Activity

Visit the PR department of the nearest hospital and make a list of the activities performed by the department.

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7.4 Welfare and Religious Services

Earlier, when there was no access to proper health clinics or hospitals, patients were healed at temples evoking mercy from the almighty and by using the resources mentioned as aptly medicinal in the holy scriptures. Since then, health, welfare, and religion have been going hand in hand. Even today, many hospitals offer spiritual treatment for patients. Nowadays, several hospitals offer religious services to patients and visitors in the following ways:

- Offer spiritual and emotional support
- Accompany those in crisis or grief
- Share prayers and sacraments
- Consult on ethical concerns and decisions

Missionary work and charity are integral parts of these religious hospitals whose main activity is to solve social problems with spiritual intervention.

7.4.1 Importance of Welfare and Religious Services

Welfare and religious services offered in hospitals are increasing day by day. People who are unable to afford expensive treatments and medicines use such welfare services. Doctors here provide free medical care for the underprivileged. The welfare and the religion-oriented hospitals heal and treat patients by practising religious activities. Certain hospitals and healthcare centres have started having additional departments or units to carry out religious and welfare functions. This helps patients to gain spirit and courage to fight against chronic health problems. Such hospitals encourage the development of child care homes, old age homes, free medical services to the under privileged, and so on. Healing in hospitals in the spiritual way is being preferred by most of the people around the world. Welfare and religious services have become an in-demand unit in present day hospitals.

🔁 Self-Assessment Questions

- 5. _____ helps patients to gain spirit and courage to fight against chronic health problems.
- 6. Missionary work and charity are integral parts of these religious hospitals whose main activity is to solve social problems with spiritual intervention. (True/False)

7.5 Hospital Safety and Security Management

A hospital is seen as a place where health safety and security are provided on standard levels. In order to manage this safety and security, hospitals today are taking numerous steps to provide people a hazard-free environment for treatment and care. The main objective of all hospital owners should not only be to invest in expensive equipment and highly professional staff but also to keep in mind the safety and security of the people at the hospital including visitors, patients, or even hospital staff.

It is essential that a hospital should manage the physical and personal security of patients, staff, and individuals within the hospital premises. This should include addressing the risks of

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violence in hospitals and security of the hospital property, equipment, supplies, and data. To achieve this, hospitals must ensure the following:

- Develop and maintain a Security Management Plan describing the processes of managing the security of patients, staff, and other people visiting the hospital.
- Identify a group of people for coordinating the development, implementation, and control of the security management activities.

7.5.1 Importance of Hospital Safety and Security Management

There are various reasons why hospitals need to focus on the safety and security of patients, staff and visitors. Some of these reasons are as follows:

- Hospital is a people intensive place.
- Hospitals are full of sick people who are unable to take care of themselves.
- Hospitals are accessible for advice and treatment.
- The hospital staff often has to operate in a tense atmosphere resulting in irritation, conflicts and aggression.
- Hospitals employ expensive equipment, fixtures and machines whose safety is essential.
- The safety of patients, attendants and their property is the moral duty of the hospital.

Some measures that can be taken by hospitals to ensure better health and safety are as follows:

- Assisting the health workers in protecting themselves against occupational exposure to hazards.
- Taking measures to reduce the ratio of injuries, due to the use of surgical instruments, etc.
- Avoiding exposure to blood and infected body fluids.
- Creating awareness and knowledge about how and where to dispose biomedical waste.
- Conducting regular demonstrations on personal and hospital hygiene, infection control, and good hospital environment.
- Enhancing the knowledge and skills of hospital staff on power and fire safety.
- Enhancing the health workers' knowledge on safe handling of hazardous chemicals.
- Improving the safety of health workers working in the laboratory and radiology departments of a hospital.

7.5.2 Types of Safety and Security Management

With an intelligent and effective security management system, hospital executives can render a facility which is well equipped with the basic tools needed to support the life-saving mission of their healthcare organisation.

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Fig. 7.2 shows the various components in a hospital that collaborate to provide safety in a healthcare organisation:



Fig. 7.2: Security of a Healthcare Organisation

Some of the physical security safeguards used by hospitals for ensuring safety and security at the workplace are shown in Fig. 7.3:



Fig. 7.3: Physical Security Safeguards used by Hospitals

Let us discuss these physical security measures in detail:

- Access control: This system is designed to ensure that only authorised people are allowed to access and leave the hospital premises.
- Emergency locks and alarms: In case of unauthorised access, these alarms help in preventing the escape of a criminal from hospital premises. Also, in case of emergencies such as fire, these alarms help in alerting the safety personnel.
- **CCTV surveillance:** Closed-circuit television helps a hospital in monitoring the people inside the hospital for any possible threat to security.
- Photo ID system: Every staff member of a hospital including doctors should be required to wear a tamper proof photo identification card including their name, contact number, name of the hospital name and logo of the hospital.

🔁 Self-Assessment Questions

- 7. _____ describes the processes of managing the security of patients, staff, and other people visiting the hospital.
- 8. ______ system is designed to ensure that only authorised people are allowed to access and leave the hospital premises.

Activity

Prepare a list of the physical security measures used by hospitals to ensure safety and security of the patients, visitors and hospital assets.

7.6 Management of Hospital Parking Problems

Parking management refers to developing and following a set of policies and programmes for efficient use of parking resources. You may call it a subconscious behavioural pattern that people hardly show a concern about what problems their parking etiquette might be posing to others until they themselves face one. But such carelessness could turn into serious problems in places like hospitals at times of emergencies. Those using a hospital's parking lot should take care that their vehicles leave enough space for the coming and going of the hospital emergency carriages.

7.6.1 Need of Parking Management in Hospitals

Parking is an essential element of the transportation system. Hospital parking management faces the challenge of parking problems most of the times. There are many factors involved in accomplishing a well-managed parking programme. However, the most effective method is to control the parking operation team. Most hospitals don't offer much parking support to the visitors leading to several problems. There are several hospitals offering limited parking space to staff and visitors and therefore, face a reactionary position when problems arise. Lack of adequate planning for parking continues to create such problems. It is advisable to understand the challenges of improper planning before problems reach the size of a mountain. In order to deal with parking issues, hospital management needs to take a proactive approach.

7.6.2 Design and Location

No matter how big or small a hospital is, a simple parking program will surely lead to smoother operations. A well-planned and designed parking area not only provides smooth parking for the visitors but also alleviates the task of the hospital management team to a considerable degree. Some of the plans and policies that hospitals could adopt for reducing parking chaos are as follows:

- Visitors and patients are generally not aware of the hospital area and tend to get diverted in the absence of a clear direction to an open parking space. A simple measure to use signals for directing people to the parking areas would help in overcoming this problem.
- Employees should not be allowed to park in areas reserved for visitors. For this, hospital
 can assign parking area to their employees.
- Patients and visitors should be assigned a parking area, which is the closest and most convenient to use.

Prioritising the parking needs of patients and visitors should be the main aim of hospital parking management. This is because in lack of a convenient parking facility, visitors and patients would be late to appointments with the probability of patients leaving for other hospitals.

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🔁 Self-Assessment Questions

- **9.** _____ refers to developing and following a set of policies and programmes for efficient use of parking resources.
- 10. Prioritising the parking needs of patients and visitors should be the main aim of hospital parking management. (True/False)

7.7 Patient Access Services

Patient Access services enable a patient to find a particular specialist, book an appointment, pay the consultation fee in advance, provide or change contact details, order a repeat prescription, retrieve medical record, send queries, request advice, etc. It is a 24-hour online service that can be used any time, day or night. Patient Access staff assist patients in defining and understanding policies, and making healthcare decisions. The basic services provided by Patient Access in hospitals are as follows:

- Offering customer service
- Identifying the patients accurately
- Providing information to the patients/families
- Determining special needs of a patient
- Administering pre-admission services
- Scheduling of resources and services
- Pre-certifying insurance
- Determining the accurate level of care
- Distributing and/or obtaining signatures on required documents
- Promoting awareness about patients' rights, privacy policy, etc.
- Controlling infection
- Proving point-of-service collections
- Collecting accurate and complete patient information

7.7.1 Need of Patient Access Services

Various duties and functions are encompassed by patient access services in healthcare facilities. This is a vital service that hospitals and other medical centres offer. Important parts of the revenue cycle are provided by the patient access team. By ensuring accurate patient identification and offering exceptional customer service throughout testing, the patient access personnel aids the hospital in meeting the requirements of regulatory authorities and preserving patient safety. The success of a hospital is heavily dependent on the work of the Patient Access Services department. The initial revenue cycle activities typically involve the majority of patient access services. The revenue cycle is an ongoing process that begins with the identification of a patient as requiring medical attention and continues until the account is closed and money is collected by the hospital. With the help of the patient access personnel, precise patient information can be obtained beginning with the registration process. Patient demographics, insurance or payment details, etc., are all part of this data set. With the help

of patient access services, hospitals have a greater chance of receiving payments on time and avoiding fines, which is good for their revenue and cash flow. As a result of the extra effort required to resolve issues with improper reimbursement, credit balances, refunds, re-billing, and denials, inaccurate patient registrations significantly impact a hospital's bottom line.

7.7.2 Design and Location

The Patient Access Services model varies across hospitals. The size of a hospital influences the manner in which the Patient Access Services model and job roles are allocated. In a large hospital, a Patient Access Service associate could be responsible for handling only a single service such as patient registration, while in a smaller facility, the same Patient Access Service associate could be responsible for taking care of a number of services. A sample Patient Access model is shown in Fig. 7.4:



Fig.7.4: A Patient Access Services Model (Source: http://www.sironahealth.com/answers)

Self-Assessment Questions

- 11. ______ helps the hospital in complying with the regulatory agencies, maintaining patient safety through correct patient identification and providing extraordinary customer service in testing situations.
- The size of a hospital influences the manner in which the Patient Access Services model and job roles are allocated. (True/False)

7.8 Hospital Transport Services

Hospitals offer transport services for its patients who are unable to drive themselves for a medical appointment owing to vehicle limitations or weakness and/or patients whose family members or other support systems cannot provide transportation at the time of a scheduled

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appointment. These services are provided both in case of emergency and non-emergency situations.

Many hospitals aim to provide a professional, reliable, hassle-free, safe and punctual transport service to its patients. For this purpose, they employ private ambulances equipped with patient monitoring equipment together with medical grade oxygen and suction equipment required for non-emergency patient transports. Assistants working in ambulance care units are experts in their fields with knowledge of comprehensive first aid, driving skills, and patient moving and handling techniques. The main aim of the Hospital Transport Services is to provide transport to a wide range of patients between their homes and hospitals, clinics, or physiotherapy department. Transport booking is usually done by the doctors, receptionists, and hospital staff. Hospital Transport vehicles are mainly designed for the comfort and safety of the patients. The recently launched transport vehicles have even more space, especially for wheelchairs.

7.8.1 Functions of a Hospital Transport Service Department

The basic function of the Hospital Transport Services department is to provide easy access vehicles for the people to reach hospital or clinic on time. Every day, the hospital transport crew makes several journeys to and from different hospitals. According to a report, 97% of patients arrive before or on time for their appointments per day. The details illustrated in Fig. 7.5 are required when a hospital transport is being booked:



Fig. 7.5: Details Required at the Time of Booking Hospital Transport

🔁 Self-Assessment Questions 🕻

- 13. The main aim of the Hospital Transport Services is to provide transport to a wide range of patients between their homes and hospitals, clinics, or physiotherapy department. (True/False)
- 14. Hospital Transport Services are provided in case of emergency situations. (True/False)

7.9 IT and Telemedicine Services

IT and telemedicine services in hospitals refer to the use of medical information exchanged through different websites (electronic communications) for improving a patient's health status. Telemedicine services involve a variety of applications and services using video conferencing,

e-mails, smart phones, wireless tools among other telecommunications technologies. In other words, telemedicine services refer to the remote delivery of healthcare services using the telecommunications infrastructure. For example, patient consultations through video conferencing, e-mailing still images, e-health patient portals, remote monitoring of vital signs, online medical education, and nursing call centres are examples of telemedicine services. Major advantages of telemedicine services are as follows:

- It improves access to healthcare services
- It reduces costs and travel for consumers and providers
- IT enhances quality of care

7.9.1 Requirement of Telemedicine and IT Unit

In India, there are only 663 government hospitals in district headquarters and sub-district areas leaving thousands of people unattended due to lack of doctors and beds for the admission of patients. In order to avoid such situations, telemedicine is being introduced in India. Such kind of services plays a major role in hospitals and healthcare centres. Doctors are now able to treat a patient using the Internet infrastructure. The productivity and usage of telemedicine data depend upon the availability of high bandwidth and Internet connection. If government and private organisations take suitable steps, a patient in a remote place could consult the doctors through Internet. Some of the main telemedicine services are as follows:

- Primary care and specialist referral services: A primary or allied health professional offers consultation to a patient, utilising live interactive videos, transmission of diagnostic images, video clips, and patient data for subsequent review, etc.
- Remote patient monitoring: This is employed to remotely gather and transmit data to a health agency for interpretation and diagnosis. These services encompass specific vital signs, such as blood glucose or heart ECG, or a variety of indicators for homebound patients.
- **Consumer medical and health information:** This entails the utilisation of the Internet and wireless devices by customers/patients to acquire specialised health information and participate in live discussion groups for peer-to-peer support.
- Medical education: This is designed to provide ongoing medical education for health professionals and specialised medical education seminars for specialists in remote locations.

It usually takes about 3-4 days to get a doctor's appointment. Using telemedicine services, it's possible to get an appointment with a doctor in a matter of a few minutes. Video calls or cellular phones are the mediums which can be used for availing telemedicine services. Telemedicine websites allow people to ask health-related questions from a licensed doctor, spending lesser amount of money. However, there are certain limitations of using telemedicine services. Patients should use telemedicine services to consult doctors only after verifying that the doctor is licensed to practise medicine. It must be known to the person or patient consulting the doctor that there's a difference between advice and treatment. For example, a doctor who is not much aware of a patient's medical history may unknowingly prescribe an incorrect medicine. Also note that some drugs cannot be prescribed online or by phone. There are certain telemedicine sites which offer help and consultation free of cost. Yet, others use these services as a part of their business providing false consultation to the patients.
Notes

Table 7.1 shows some benefits of using telemedicine services for both client and service providers:

Table 7.1: Benefits of Us	ing Telemedicine Services
Clients	Care Providers
Improves access to clinical and specialist	Increases access to clients
services	
Reduces client travel time	Reduces are provider's travel time
Saves costs associated with travel and	Saves costs associated with travel and
accommodations	accommodations
Decreases time between diagnosis and	Expands the use of inter-profession teams
provision of care	to enhance client care
Improves management of chronic diseases	Increase chances for professional
	development and specialist services
Decreases incidence of hospital re-	Save hospital beds for those who really need
admission	them
Consistent, reliable supervision and care	Mentoring of direct care allied health
support	professionals
Early warning system to care provides thus	Educational tool for remote locations in
mobilizing care rapidly	contact with larger regional hubs
Saves lives	Timely decision making delivering the best
	outcome possible

7.9.2 Design and Location

Telemedicine services must be developed and designed in a way that it caters to the needs and sensibilities of the people who use or deliver them. The telemedicine infrastructure should be applied in a way that is can be used by one or more parties. The telemedicine service model needs to be designed in a way that allows for a seamless transition from conventional practices. The design and location of the telemedicine services online are usually decided by the IT experts. In hospitals, highly professional IT staffs are hired in order to give patients a standard and secure service. As it is convenient for people who live in remote areas to talk to doctors using telemedicine services, the IT department designs the software in a way that the communication or the consultation between the doctor and the patient happens smoothly. The site designed for the telemedicine services also offers video chats and voice chats. Three main features in a telemedicine infrastructure are the service design, interface design and experience design. Some of the points to be kept in mind before offering telemedicine services are as follows:

- There ought to be a proficient and knowledgeable telemedicine team, possessing adequate expertise and scale to deliver the service with excellence and uniformity at both the provider and patient sites.
- All locations must have appropriately designed and equipped facilities with top-notch telecommunication infrastructure to facilitate doctor-patient interactions seamlessly, without any disruptions.
- Crucial protocols must be established to guarantee the delivery of high-quality and consistent care.
- Necessary legal agreements, business arrangements, and billing procedures should be established.

Self-Assessment Questions

- **15.** ______ is used to remotely collect and send data to a health agency for interpretation and diagnosis.
- The design and location of the telemedicine services online are usually decided by the IT experts. (True/False)

7.10 Summary

- Auxiliary services are additional or complementary services provided by an organisation in addition to the core services to support and serve its clients.
- To achieve higher service levels, hospitals and volunteer organisations provide patients with auxiliary services.
- These auxiliary services include registration and indoor case records, store management, transportation management, mortuary arrangement, dietary services to patients, maintenance service, etc.
- Public Relations activities involve planned promotion of goods or services offered by organisations in order to earn goodwill.
- The basic role of a hospital's PR is to assist both internal and external departments responsible for the growth and promotion of the hospital.
- Certain hospitals and healthcare centres have started having additional departments or units to carry out religious and welfare functions, which help patients to gain spirit and courage to fight against chronic health problems.
- It is essential that a hospital should manage the physical and personal security of patients, staff, and other visitors within the hospital premises.
- Parking management refers to developing and following a set of policies and programs for efficient use of parking resources.
- Hospital parking management faces the challenge of parking problems most of the times.
- Most hospitals don't offer much parking support to the visitors leading to several problems.
- A well-planned and designed parking area not only provides a smooth parking for the visitors but also alleviates the task of the hospital management team to a considerable degree.
- Patient Access services enable a patient to find a particular specialist, book an appointment, pay the consultation fee in advance, provide or change contact details, order a repeat prescription, retrieve medical record, send queries, request advice, etc.
- Hospitals offer transport services for its patients who are unable to drive themselves for a medical appointment owing to vehicle limitations or weakness and/or patients whose family members or other support systems cannot provide transportation at the time of a scheduled appointment.
- IT and telemedicine services in hospitals refer to the use of medical information exchanged through different websites (electronic communications) for improving a patient's health status.
- Telemedicine services must be developed and designed in a way that it caters to the needs and sensibilities of the people who use or deliver them.

Notes

7.11 Glossary

- Ancillary services: These refer to the support services provided to hospital patients during the course of treatment. These services include laboratory, radiology, pharmacy, and physiotherapy, etc.
- Auxiliary services: These refer to the additional or complementary services provided by an organisation in addition to the core services to support and serve its clients.
- **Biomedical waste:** It refers to any solid or liquid waste that has the potential to infect humans and includes tissues, body parts, blood, body fluids, laboratory wastes, etc.
- Mortuary: It refers to a place in hospitals where dead bodies are kept temporarily.
- **Pathology:** It refers to the branch of medical sciences dealing with the diagnosis of diseases from laboratory analysis of bodily fluids such as blood and urine.
- **Telemedicine:** It refers to the use of telecommunication services and information technology for providing medical care at a distance.

7.12 Terminal Questions

- 1. Discuss the concept of auxiliary services.
- 2. Explain the role and importance of Public Relation department.
- 3. Describe a hospital's Safety and Security Management system.
- 4. Write a note on Patient Access Services in hospitals.
- 5. Explain the telemedicine services provided by hospitals.

7.13 Answers

Q. <	Self-Assessment Questions
1.	Auxiliary services
2.	True
3.	True
4.	Public Relations Manager
5.	Welfare and Religious Services
6.	True
7.	Security Management Plan
8.	Access control
9.	Parking management
10.	True
11.	The patient access staff
12.	True
13.	True
14.	False
15.	Remote patient monitoring
16.	True

Q.	Terminal Questions
1.	Auxiliary services are additional or complementary services provided by an organisation in addition to the core services to support and serve its clients. Refer to section 7.2 Concept of Auxiliary Services .
2.	The basic role of a hospital's PR is to assist both internal and external departments responsible for the growth and promotion of the hospital. Refer to sub-section 7.3.1 PR: Role and Importance.
3.	A hospital's Safety and Security Management system includes policies and plans to address the risks of violence in the hospitals and security of the hospital property, equipment, supplies, and data. Refer to section 7.5 Hospital Safety and Security Management .
4.	Patient Access services enable a patient to find a particular specialist, book an appointment, pay the consultation fee in advance, provide or change contact details, order a repeat prescription, retrieve medical record, send queries, request advice etc. Refer to section 7.7 Patient Access Services .
5.	Telemedicine services in hospitals refer to the use of medical information exchanged through different websites (electronic communications) for improving a patient's health status. Refer to section 7.9 IT and Telemedicine Services .

7.14 Case Study: Canberra Hospital Auxiliary Services

Because of their consistently excellent work, the Canberra Hospital Auxiliary has become a household brand in the medical and service industries. Auxiliary services are provided by the hospital's community of volunteers, who come together as a unit to aid patients, visitors and employees. More than three decades have passed since the Hospital Auxiliary first opened its doors. Substantially improving the quality of life for patients and visitors, the auxiliary services made significant donations of various medical equipment and supplies throughout this period. Additionally, they have contributed financially to the staff's professional growth and educational pursuits. A gift of \$2 million was made to the auxiliary unit of Canberra Hospital in December 2009, bringing the hospital's funds to an all-time high.

The hospital has maintained its volunteer services available to everyone. Details on the auxiliary services, which is open to anybody interested in providing its services, can be found at the kiosk in the main lobby of Canberra Hospital. The comfort of everyone involved—from patients and staff to the community at large—is the primary focus of these services, which are provided by the hospital. Trolley services, tourist and patient guides, a library, charitable events, trusts, and other ancillary services are all part of what a hospital offers.

Discussion Questions

1. Discuss the significance of auxiliary services for the success of Canberra Hospital.

(**Hint:** The auxiliary services provided by Canberra Hospital help in providing additional comfort and care to visitors and patients.)

2. Discuss the scope of auxiliary services in the hospital industry?

(Hint: Auxiliary services help in streamlining the flow of medical services in hospitals.)

Notes

7.15 References and Suggested Readings

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CHAPTER



Location and Layout Selection

Structure

- 8.1 Introduction
- Learning Objectives
- 8.2 Selecting a Suitable Location for Facility Setup
- 8.3 Process of Selecting Location
- 8.4 Layout for Hospitals
- 8.5 Summary
- 8.6 Glossary
- 8.7 Terminal Questions
- 8.8 Answers
- 8.9 Case Study: Facility Design at Stobhill Hospital
- 8.10 References and Suggested Readings

Notes

Learning Objectives

After completing the chapter, you will be able to:

- Discuss how to select a suitable location for facility setup
- Explain the process of selecting location
- □ Discuss the concept and significance of hospital layout

8.1 Introduction

The selection of an appropriate location and layout are the two most important strategic decisions made by any healthcare unit. This is because the overall success of a hospital depends on its location and layout. A hospital usually invests a large sum of money for selecting a facility location and developing a layout. Therefore, an improper location and layout of a hospital may incur heavy losses for hospital administration.

Plant location refers to a region or site selected by an organisation for setting up a facility. Selecting a plant location is a strategic decision that cannot be changed very often once taken. Therefore, like any other organisation, a hospital needs to select a plant location after analysing the cost and benefit aspects of different alternative sites. An ideal facility location is one where the cost of producing services is kept lowest with a large community base to serve. To achieve this objective, a hospital needs to take into account various factors, such as proximity to patients and supply and availability of labour and capital.

After selecting a location, the next challenge for a hospital is to design an effective layout. Facility layout is all about the arrangement of physical facilities, such as machinery, equipment, and tools in a way so as to maintain a quick flow of materials at minimum handling cost. A well-designed facility layout helps a hospital to make efficient utilisation of available floor space and labour, reduce accidents, and improve its productivity.

Designing a health care setting for the patients is far more difficult than just about the selection of the colour for the beddings, walls or the kind of furniture required. If done correctly, and sensibly, the design and facilities of that healthcare unit can change the performance of the organisation and the tasks performed. More than this, an ideal, patient-focused healthcare aura is needed to be maintained in the institution, to enhance the treatment compliance.

A healthcare institution can be as small as a clinic to as large as a multispecialty hospital. This can be further classified on the basis of employed facilities and technologies for patient care such as parking area, ease of patient movement area with the aid of signals or floor maps, etc. Therefore, the location and layout of a healthcare setting is regulated by varied guidelines and standards. In this chapter, you will study the importance of selecting a suitable location and layout for the hospitals.

8.2 Selecting a Suitable Location for Facility Setup

Facility location plays a significant role in the growth of a hospital. A hospital that is located at the prime location of the city would be able to attract patients much quicker as compared to a hospital located in a remote area. Thus, it is essential for a hospital to select a proper facility location to gain a competitive advantage by reducing various costs.

A good facility location helps a hospital in establishing a facility layout and ensuring an adequate supply of equipment and other materials that are needed to provide better healthcare service. Therefore, hospitals should be careful while selecting its location as any mistake at this stage

may have adverse effects on its operations, thereby incurring huge losses for the organisation. Some of the important factors that should be considered by a hospital while selecting its plant location are proximity to materials, proximity to patients, availability of staff, and environmental policy. A hospital may look for a new facility location for the following reasons:

- Start of a new healthcare facility
- Obsolescence of the existing technology
- Expansion of the existing facility
- Expiry of the lease agreement
- Reduction in overall costs
- Irregular supply of labour

Regardless of the reason for selecting a new facility location, a hospital should consider all the factors that affect its facility location. Although it is difficult to find out a location having all the desired facilities, a hospital should select a location that would generate maximum growth opportunities.

8.2.1 Factors to be Considered while Selecting Facility Location

In the business context, services provided by a hospital can be defined as an economic activity that is concerned with the conversion of inputs into valuable output. While selecting a plant location, a hospital should consider various factors that can have significant impact on its performance. These factors are explained as follows:

- Market proximity: The nearness of a hospital to the community or market (in business terms). Proximity allows a hospital to deliver its services on time, which, in turn, results in higher patient satisfaction. Apart from this, market proximity leads to reduction in transportation costs. This ultimately helps a hospital to reap the benefits of favourable market demand.
- **Proximity to supplies:** The major factors to be considered while selecting a plant location. Nearness to the sources of supplies reduces the transportation cost of an organisation and maintains regular supply of materials that are needed in a hospital. This enables a hospital to carry out its production process smoothly. Therefore, while selecting a plant location, a hospital should also perform in-depth analysis of the time and cost involved in the procurement of supplies. In case the time and cost for the procurement of supplies are high, the hospital should search for other available alternatives.
- Availability of capital: A hospital needs capital for initial promotion and expansion. Therefore, a hospital should select a plant location that is closer to banks or other financial institutions to ensure easy availability of capital whenever required.
- Availability of labour: It is another important factor that a hospital should take into account while selecting its plant location. Labour is a vital resource in the production process of a hospital. The machines and equipment of an organisation cannot process without the availability of skilled doctors, nurses, technicians, pathologists, etc. Therefore, being a service industry, a hospital should look for a location where there is easy availability of skilled labour at minimum cost.
- Transportation system: The availability of proper transportation can ensure timely and regular supply of materials and movement of staffs at a relatively low cost. Therefore, it is necessary for a hospital to give due consideration to the availability of transportation facilities while selecting a plant location.

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- Government policies: To ensure balanced regional development, the government undertakes various schemes and policies. For example, the government provides various incentives and subsidies to hospitals that establish their units in backward areas. Therefore, it is important for a hospital to thoroughly study all government policies before selecting a location.
- Availability of power: It is the prime factor responsible for the operation of any medical equipment and machine. The production process of a hospital would come to a halt in the absence of power. Therefore, proper availability of power is vital for a hospital to function properly.

Self-Assessment Questions

- 1. A hospital that is located at the prime location of a city would be able attract patients much quicker as compared to a hospital located in a remote area. (True/False)
- **2.** What are the important factors that should be considered by a hospital while selecting its plant location?
- 3. How does proximity result in higher patient satisfaction?

Activity

Visit the hospital administration department of a hospital in your vicinity and ask the person in charge about the various factors that were considered while selecting a facility location for the hospital. Prepare a report based on your discussion.

8.3 Process of Selecting Location

From the discussion so far, you can say that selecting an appropriate location is of utmost importance for a hospital. This is because the success of a hospital entirely depends on its location. Selecting a hospital location is a systematic process that is based on certain parameters. Fig. 8.1 shows the steps involved in selecting a hospital location:



Fig. 8.1: Process of Selecting a Hospital Location

Let us discuss the steps involved in selecting a hospital location in detail.

8.3.1 Checklist Analysis

A checklist is a list of relevant factors like cost, accessibility, competition, demographics, etc., which should be analysed by a hospital while selecting a hospital location. Let us discuss how to analyse these factors:

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- **Geographic analysis**: A hospital divides a community into different geographical areas based on cities, states, and countries. Each area has its own characteristics.
- **Demographic analysis:** Before setting up a hospital, hospital administration should also considers the demographic attributes, such as age, gender, income, occupation, religion, race, and social class, of the target patients.
- **Psychographic analysis**: It involves a study of lifestyle, values, and beliefs of people in the location where a hospital administration wishes to open the hospital.
- Competitive analysis: It involves determining the size and level of competition in a particular location. This not only helps in understanding the strategies and plans of competitors, but also enables the hospital to determine their reaction towards a new entrant in the market. To do so, the hospital administration needs to collect and analyse information related to all the competitors in the area where it wants to setup the hospital.
- Financial analysis: It basically involves determining the financial viability of a particular location. A hospital needs to estimate development costs, fixed costs, variable costs, and operational costs, etc. in the first 3 to 5 years, as well as return on investment before setting up a hospital.
- Gravitational model based analysis: It involves analysing the appeal of a hospital with respect to distance travelled by patients to reach the hospital. Patients usually go to the hospitals that are easily accessible (especially in emergency cases) and well equipped. Therefore, before setting up a hospital, hospital administration should properly analyse whether the hospital would be easily accessible to the patients.

8.3.2 Analysing Infrastructure and Taking Permission from Authorities

The selection of a location not only depends on the interest of hospital administration but also needs approvals from several bodies like government, land developers, community & statutory agencies etc. A hospital administration needs to take local and state government permits and sometimes central government licences before opening a hospital.

Moreover, hospital administration should also analyse the condition of infrastructure of a location like roads, electricity, water, expansion possibility, accessibility, network accessibility, development costs, local taxes like municipality, toll, octroi, operating and maintenance costs, job creation etc. before setting up a hospital.

8.3.3 Locating Alternative Sites and Making Selection

After doing primary analysis, hospital administration may identify a few alternative locations to establish a hospital. However, the final selection depends on various factors, which are:

- Traffic: It reflects the dimension of number of patients walking to the hospital location.
- Accessibility: Accessibility of a hospital depends on its nearness to public transport systems, availability of parking areas, etc.
- **Visibility:** It is a factor that should be considered from the perspective of patients. The location of a hospital should be easily visible to patients.
- Rent/ buying decisions: The choice of a location also depends on the decision of hospital administration whether they want to buy a hospital location or avail it on lease/

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rent. These decisions are influenced by various factors, such as availability of funds, nature of treatment, future growth plans for the hospital, and intended geographical area. Typically, big hospitals are constructed on an area that is owned by the hospital itself or by the government. However, small nursing homes and clinics may avail rented land for opening the facility.

Self-Assessment Questions

- **4.** A ______ is a list of relevant factors like cost, accessibility, competition, demographics, etc., which should be analysed by a hospital while selecting a hospital location.
- 5. _____ involves a study of lifestyle, values, and beliefs of people in the location where a hospital administration wishes to open the hospital.
 - a. Geographic analysis
 - b. Demographic analysis
 - c. Psychographic analysis
 - d. Competitive analysis
- 6. Why does a hospital need to do financial analysis?
- 7. Hospital administration needs to take local and state government permits and sometimes central government licences before opening a hospital. (True/False)
- 8. What are various factors that affect the final location selection decision of a hospital?

8.4 Layout for Hospitals

With ever-increasing competition in the healthcare sector, hospital ambience has become an important aspect to patients. Today, patients prefer to visit a hospital that provides clean, well-lighted and well-structured atmosphere to them.

A hospital design or layout is a discipline that combines different areas of expertise in designing and constructing hospital space. It provides specifications for the interior and exterior of the hospital.

To carry out its operations smoothly, it is imperative for every hospital to have proper facility layout planning. It is also known as facility designing. A facility layout denotes to the process of arranging various physical facilities, such as machinery and equipment, within the hospital in such a way so as to maintain a quick flow of materials at minimum cost. The following are some of the popular definitions of facility layout:

As described by Moore, facility layout is an act of planning that intends for optimum arrangement of facilities, as well as personnel, operating equipment, storage space, material handling equipment and all other supporting services. It also designs the best structure to encompass these facilities.

According to Knowles and Thomson, facility layout involves:

i. "Planning and arranging machinery, equipment and services for the first time in completely new facility;

ii. The improvements in layouts already in use in order to introduce new methods and improvements in procedures"

The concept of facility layout is not only confined to the initial movement of machines and equipment, but also involves re-arrangement of the existing layout to improve its performance. The design of a plant layout varies across different hospitals depending upon their specialisation and location.

Since few decades, there have been repetitive vogues about theories of planning and designing of healthcare facilities. Specialised healthcare units need to have modern patterns for wards and nursing sections with effective surroundings and facilities. While planning a facility layout, the hospital administration should focus on the following aspects:

- Patient-oriented care is the foremost motto of the care process, as patients' are wholesole reason for the existence of hospitals in our community.
- Effective plans, medical safety, ideal operational rapports, monetary value, contemporary systems, are the other requirements of sound facility layout.
- Focus should be on applying supportable layouts and extensive usage of facilities.
- The hospital should ensure to provide curative environment that comprises both friendliness and cordiality, and not just combination of science and technology, as it is meant for.

Facility layout depends on various factors that consist of:

- ◆ Infrastructure: This is one of the most important factors that should be considered by hospitals while planning its layout. The nature and size of a hospital building helps to determine the space available for layout. Apart from this, the hospital should also consider special requirements, such as air ventilation, dust control, and humidity control, while planning its facility layout.
- Machinery: The usage of equipment and machinery varies across different hospitals. Some hospitals use machinery for general purpose, while others use machinery only for some specific purposes.
- **Nature of treatment:** Facility layout also depends on the type of treatment provided by hospitals. For example, obstetrical services require special facilities to ensure proper safety and care for mother and new-born child. Usually, such patients are kept in separate a hospital wing to avoid infection.
- Management policies: Indicate that management policies have significant impact on the facility layout. Some of these management policies are as follows:
 - Degree of automation
 - Future expansion plan
 - Personnel policy
 - Purchasing policy
- **Employee needs:** A hospital should also consider the needs of its employees as well while planning its layout. Therefore, there should be proper facilities for employees, such as cloakrooms washrooms, lockers, and drinking water. Moreover, proper provisions should be made for the disposable of wastes.

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8.4.1 Significance of Location Layout

As discussed earlier, a hospital needs to have a proper facility layout to carry out its process smoothly. The following points explain the significance of an effective facility layout:

- **Minimum material handling:** A proficient facility layout ensures that machines and equipment are positioned to necessitate minimal handling. This ultimately diminishes the material handling expenses of a hospital.
- Elimination of bottlenecks: A suitable facility layout alleviates bottlenecks stemming from inadequate design and machine capacity. Such bottlenecks result in issues like congestion, inefficient use of floor space, and accidents. A hospital can avert these challenges with a well-planned facility layout.
- Reduction in delays: A precise facility layout significantly aids in the prompt execution of various tasks. A sound facility layout diminishes factors causing delays in patient treatment, such as space shortages, material transfers between departments, and flawed tasks.
- Improved quality control: A proficient facility layout offers a foundation for rigorous oversight of activities within a hospital. An effective layout enables inspections at different stages of healthcare service delivery, ensuring the produced output meets the required standards.
- Efficient utilisation of staff: A well-structured facility layout organises operations in a manner that maximises the productive time of each staff member.
- Improved employee morale: A positive workplace environment fosters enthusiasm and positivity among employees. A correct facility layout bolsters employee morale by ensuring:
 - Better working environment
 - Reduced number of mishaps
 - Increased earnings
 - Better employee facilities

8.4.2 Types of Layouts

A hospital layout differs from one organisation to another depending on their requirements. Based on the requirements of different hospitals, there can be different types of layouts, which are as follows:

- Process layout: It involves the grouping of similar types of machines at one place. This type of layout is also known as functional layout. For instance, in the process layout, all the machines and equipment involved in providing similar kind of healthcare service are grouped in one department. For example, machines and equipment used in the radiology department. In a hospital, a patient is moved from one department to another where similar types of machines are grouped together to perform the process. In a process layout, the following points should be kept in mind while grouping machines:
 - There should be shorter distance among departments.
 - The principle of sequence of operations should be followed while grouping machines in their respective departments.

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• There should be proper inspection of machines and operations.

The following are the advantages of the process layout:

- Requires minimum investments in machines
- Enhances the flexibility of a hospital by producing maximum output without changing the arrangement of machines
- Facilitates specialised supervision
- Does not interrupt the process flow due to machine breakdowns
- Ensures optimum utilisation of equipment

The major disadvantages of the process layout are as follows:

- Requires back-tracking and long-routing of processes, which increases material handling cost
- Requires a large floor area, which can be expensive for a hospital
- Requires prolonged processing time
- Product layout: It signifies a layout where machines are arranged in a sequence required in the healthcare service production process. A product layout is also known as the straight-line layout. In this layout, each stage of operation is carried out by a specialist machine. Therefore, the product layout requires a larger number of machines as compared to the process layout. In this type of layout, special purpose machines are used for diagnosis and treatment. A hospital using the product layout should consider the following points while grouping different machines:
 - All the machines and equipment should be arranged in a sequence as required in operations.
 - Two lines should not be coinciding with each other.

The following are the advantages of the product layout:

- Requires minimum material handling cost
- Reduces bottlenecks in the production process
- Provides better control of the production process
- Requires minimum inspection

However, the following are the disadvantages of the product layout:

- Provides lesser flexibility
- Requires huge investments for arranging and grouping different machines
- Requires the execution of individual incentive schemes, which can be difficult for a hospital
- Lacks specialised supervision
- Service layout: Service layouts are similar to process layout as services require a more customised approach than other industries. An effective service layout should focus on providing customer satisfaction. There should be economic movement of people and equipment, larger safety, better comfort and suitability, and more adaptability to changing conditions.

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Hospitals, being a service industry, should focus more on the basic principles of facility layout. While planning a service facility layout, a hospital should ensure that the hospital premise and the passages inside the hospital are broad, well-lighted, less crowded, and well-organised. The location of operation theatres, surgical wards, general wards, and passages for the movement of inpatients, outpatients, and staffs are spacious, and systematically designed. Therefore, the service facility layout of a hospital should focus on substantially improve patient care and comfort, and the overall productivity of the hospital.

Self-Assessment Questions

- **9.** A hospital _______is a discipline that combines different areas of expertise in designing and constructing the hospital space.
- **10.** The concept of facility layout is only confined to the initial movement of machines and equipment. (True/False)
- 11. Name the factors that affect layout of a hospital.
- **12.** _____ layout involves grouping of similar types of machines at one place.
- 13. A service layout is also known as straight-line layout. (True/False)
- 14. The _____layout requires a larger number of machines as compared to _____the layout.

8.5 Summary

- It is essential for a hospital to select a proper facility location to gain a competitive advantage by reducing various costs.
- A good facility location helps a hospital in establishing a facility layout and ensuring an adequate supply of equipment and other materials that are needed to provide better healthcare service.
- While selecting a location, a hospital should consider various factors that include:
 - Market proximity
 - Proximity to supplies
 - Availability of capital
 - Availability of labour
 - Transportation system
 - Government policies
 - Availability of power
- The steps involved in selecting a hospital location include:
 - 1. Checklist analysis
 - 2. Analysing infrastructure and taking permission from authorities
 - 3. Locating alternative sites and making selection
 - A checklist analysis should include:
 - Geographic analysis

CHAPTER 8 \blacksquare Location and Layout Selection

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- Demographic analysis
- Psychographic analysis
- Competitive analysis
- Financial analysis
- Gravitational model based analysis
- The selection of a location not only depends on the interest of hospital administration but also needs approvals from several bodies like government, land developers, community and statutory agencies, etc.
- The various factors that affect the final location selection decision of a hospital include, traffic, accessibility, visibility, and rent/ buying decisions.
- A hospital design or layout is a discipline that combines different areas of expertise in designing and constructing the hospital space. It provides specifications for the interior and exterior of the hospital.
- The factors that affect the layout of a hospital include infrastructure, machinery, nature of treatment, management policies, and employee needs.
- An effective facility layout helps in:
 - Minimum material handling
 - Elimination of bottlenecks
 - Reduction in delays
 - Improved quality control
 - Efficient utilisation of staff
 - Improved employee morale
- Based on the requirements of different hospitals, there can be different types of layouts, which are:
 - Process layout
 - Product layout
 - Service layout

8.6 Glossary

- Competitive analysis: It involves determining the size and level of competition in a particular location.
- Market proximity: It refers to the nearness of a hospital to the community or market (in business terms).
- Plant layout: It indicates a manner in which machines and equipment are arranged for production purposes.
- Plant location: It refers to a place where an organisation is located.

NOTES

8.7 Terminal Questions

- 1. Discuss the factors that should be considered while selecting facility location.
- 2. Discuss the steps involved in selecting a hospital location.
- 3. Explain the factors that affect layout of a hospital.
- 4. Discuss the significance of an effective facility layout.
- 5. Discuss different types of layouts.

8.8 Answers **Self-Assessment Questions** Q. True 1. The important factors that should be considered by a hospital while selecting its 2. plant location are proximity to materials, proximity to patients, availability of staffs, and environmental policy. Proximity allows a hospital to deliver its services on time, which, in turn, results 3. in higher patient satisfaction. Checklist 4. c. Psychographic analysis **5**. Financial analysis basically involves determining the financial viability of a 6. particular location. 7. True The various factors that affect the final location selection decision of a hospital 8. include, traffic, accessibility, visibility, and rent/ buying decisions. Design or layout 9. 10. False 11. The factors that affect layout of a hospital include infrastructure, machinery, nature of treatment, management policies, and employee needs. 12. Process 13. False 14. Product, process Q. **Terminal Questions** While selecting a plant location, a hospital should consider various factors that 1. include market proximity, proximity to supplies, availability of capital, availability of labour, transportation system, government policies, and availability of power. Refer to sub-section 8.2.1 Factors to be considered while selecting Facility Location. The steps involved in selecting a hospital location include Checklist analysis, 2. analysis of infrastructure and taking permission from authorities, alternative sites location and making selection. Refer to section 8.3 Process of Selecting

Location.

3.	The factors that affect layout of a hospital include infrastructure, machinery, nature of treatment, management policies, and employee needs. Refer to section 8.4 Layout for Hospitals .
4.	An effective facility layout helps in minimum material handling, elimination of bottlenecks, reduction in delays, improved quality control, efficient utilisation of staff, and improved employee morale. Refer to sub-section 8.4.1 Significance of Location Layout .
5.	Based on the requirements of different hospitals, there can be different types of layouts, which are Process Layout, Product Layout, and Service Layout. Refer to sub-section 8.4.2 Types of Layouts .

8.9 Case Study: Facility Design at Stobhill Hospital

Located north of Glasgow, Scotland, Stobhill Hospital provides diagnostic and ambulatory care services. As a Poor Law Hospital, Stobhill began in 1904. Among the world's tiny hospitals, the hospital is now at the top. It won the title of "world's greatest tiny hospital" in 2010, making history as the first hospital in Scotland to do so.

That facility is absolutely breathtaking, says Margaret Watt of the Scottish Patients Association. It stands to reason that patients should have a favourable experience there. Neither is it dark nor dirty. Beautiful and airy. Future hospital designs should take a page out of the Stobhill location.

Reduced wait times are only one way the building's well-planned layout improves the quality of care patients get. To achieve this goal, we minimise patient anxiety and stress by making sure they get to the correct place at the right time and by making sure transfers between regions of the facility take as little time as possible.

The popularity of the hospital attracts lot people to visit the building. The luxurious facility design is a great specimen for architects and students of health collages from the UK and overseas. From reception to various departments, everything is well-designed with enough space to deal the crowd and emergency situation. It also has its own parking lot and patient transport system.

Outpatient services, day surgery, and diagnostics are all easily accessible from the central atrium that the door opens onto. A four-story deep-plan building located north of the atrium houses the highly served areas, including the radiation and surgical departments. A three-story building to the south houses the MIU and outpatient consultation areas; the smaller-scale cellular housing is organised in a series of narrow plan "loops" around courtyards that provide sunlight and some vistas. Direct and discrete access to the MIU is provided via an elevated bank to the south of the facility, which also serves as a visual buffer for the adjacent mental health unit. In sharp contrast to many other scale hospital diagrams, this one is both clear and human.

The building is completely mechanically ventilated. The building standalone facilities provide staff's personal needs such as banking, food, and refreshments. Overall the facility design of Stobhill is an ideal one for hospital management students to learn how to design the layout plan of a small scale healthcare facility.

Discussion Questions

1. What is the major point of attraction at Stobhill Hospital?

(Hint: The excellent facility design of Stobhill is the major point of attraction at Stobhill Hospital)

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2. With reference to the given case study, explain why facility design is important for the growth of a hospital?

(Hint: If done correctly, and sensibly, the design and the facilities of health care unit can change the performance of the organisation. The building of Stobhill Hospital is designed in such an efficiently organised manner that it enhances the overall patient experience by ensuring that patients arrive in the right place at the right time with the minimum levels of stress and anxiety.)

(Source: http://www.ads.org.uk/healthierplaces/features/case-study-new-stobhill-hospital)

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CHAPTER

9

Managing Productivity and Measuring Performance

Structure

9.1	Introduction
	Learning Objectives
9.2	Forecasting Patient Demand
9.3	Capacity Analysis and Utilisation
9.4	Common Hospital-wide Productivity Metrics and Work standard
9.5	Productivity Measures
9.6	Improving Productivity
9.7	Principles of Productivity Management
9.8	Work Measurement: Technique for Improving Productivity
9.9	HR Incentives Calculation and its Applications in Hospital
9.10	Value Addition Service in Hospitals
9.11	Summary
9.12	Glossary
9.13	Terminal Questions
9.14	Answers
9.15	Case Study: Productivity Issues at Marlborough Hospital
9.16	References and Suggested Readings

Notes

Learning Objectives

After completing this chapter, you will be able to:

- **D** Explain the concept of forecasting patient demand
- Discuss the concept of capacity analysis and utilisation
- **□** Elaborate on common hospital-wide productivity metrics
- **Explain** the concept of HR incentives calculation and its applications in a hospital
- Discuss value-addition services in hospitals

9.1 Introduction

The previous chapter discussed about the location and layout selection of hospitals. However, the success of a hospital is not only dependent on an appropriate location and layout. It is also equally important for a hospital to manage its productivity and measure performance. In this chapter, let us study how productivity and performance are measured in a hospital.

Productivity is a measure of the rate at which output is produced per unit of input. It depends on a number of factors, such as availability of resources, change in business cycles, and government policies. Different industries measure productivity differently. For example, in the manufacturing sector, productivity is measured on the basis of number of hours taken by labour and machines to produce output. On the other hand, in the service sector, it is measured based on the total revenue generated by employees. Higher productivity leads to lower costs, improved competitiveness, and high profits of an organisation. Therefore, an organisation uses various methods to improve its productivity. Job analysis and work study are the two most commonly used methods for improving productivity.

However, most healthcare organisations concentrate on meeting performance targets and maintaining financial balance and are not specifically concerned with optimising productivity. Thus, the study of productivity management becomes more important in healthcare sectors.

Performance measures are known as a significant element of excellence management plans. They help organisations to identify performers and reward them, and encourage nonperformers to perform better. Good workforce results in good productivity. The management target has always been to lower down input costs, rebalance activity between hospitals and primary care, and reduce administration expenses, and improve hospital productivity. Work measurement is a systematic approach to determine the best possible way to perform a job, which, in turn, helps an organisation in achieving a higher level of productivity.

The chapter begins by explaining the concepts of forecasting patient demand and capacity analysis and utilisation in hospitals. After that, it discusses productivity metrics and work standards. Further the chapter discusses productivity used measures in hospitals. Towards the end, the chapter explains incentives and value-added services in hospitals.

9.2 Forecasting Patient Demand

An organisation faces several internal and external risks, such as high competition, failure of technology, labour unrest, inflation, recession, and change in government laws. Therefore, most of the business decisions of an organisation are made under the conditions of risk and uncertainty. An organisation can lessen the adverse effects of risks by forecasting. Forecasting implies predicting about the future. In case of hospitals, forecasting imply planning about various aspects, such as how many beds to hire, how many employees to train and hire, and how many clinics to start. For this, major forecasting is needed called patient demand forecasting. Forecasting minimises the waiting time and improves customer service. In particular sites, like the surgical set, SKU-along with location-specific forecasting know-how can be utilised to coordinate surgeon preference facts and envisage insist based on the hospital's preparation, patient demographics, and furthermore even recurring demands – by the means of consequential benefits of compact account intensity or the lesser costs for case readiness, and enhanced fill rates, and overhaul levels.

🔍 Exhibit

Significance of Demand Forecasting for an Organisation

The following points explain the significance of demand forecasting:

- Fulfilling objectives: At the outset, every department has its own set of goals. These goals can be attained with the use of demand forecasting. In order to reach its objectives, a company first determines how much demand is there for its products and services in the market. Take the case of a company whose goal is to sell 50,000 goods. This would necessitate the company to undertake product demand forecasting. The organisation will take remedial measures to ensure the achievement of the goal if product demand is low.
- Stabilising employment and production: A company's production and recruitment efforts can be better managed with the use of forecasting. An organisation can save money by not wasting resources when production is based on anticipated product demand. In addition, this facilitates the recruitment of the necessary human resource for an organisation. If a company anticipates a surge in product demand, for instance, it can decide to hire more people to meet that need.
- **Expanding organisations:** A company might benefit from demand forecasting while making decisions about growing their firm. The company may intend to grow even more in the future if product demand is higher than anticipated. Conversely, the company may reduce investment in the enterprise if product demand is anticipated to decline.

A hospital can't predict how many patients will use which departments and services at any one time without first knowing the overall traffic and patient volume. Aligning resources with demand is also an impossibility. Predicting how many patients will be seen over a given time frame is known as patient forecasting. Qualitative and quantitative forecasting are the two main categories of forecasting.

These two types of forecasting are explained as follows:

- Qualitative forecasting: Qualitative techniques are used to forecast short-term patient requirements of a hospital. These techniques are more subjective as compared to quantitative methods of demand forecasting. Hospitals use qualitative methods to augment estimations made using quantitative methods. The following are three main qualitative techniques to estimate the future patient needs of an organisation:
 - **Expert opinion:** It is a method in which decisions are made as per the suggestions given by marketing, production, finance, purchasing, administration, and other knowledgeable specialists. The suggestions given by experts are used to forecast patient demand for the organisation in the future. This approach helps the top

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management of the hospital to forecast demand quickly and easily without using statistical techniques. In addition, this method can also be applied when the exact or correct data is not available. However, this method is based on groupthink, which can be cohesive. Consequently, high cohesiveness in the group creates group conformation, which reduces opposition and confronts views of group members.

- **Delphi technique:** It is a structured and systematic technique in which questions are individually asked from experts to obtain their opinions on various future events. Unlike the expert opinion method, this technique is used to estimate the long-term patient needs of hospitals. In this method, face-to-face communication among experts is evaded at the time of decision-making process as it can lead to an unfair agreement due to dominant personality factors. The opinions provided by experts are reviewed by a third party along with additional questions that are sent back to the experts. This process is repeated till a consensus is obtained. In this technique, questions are asked from experts to avoid the disadvantages of groupthink; however, this technique is not reliable as well as is expensive.
- Nominal Group Technique (NGT): It is a decision-making technique that is used in a group. In this method, a particular problem is presented to group members to obtain possible solutions from each member of the group. Further, the answers given by the group members are clarified in front of the group members. A list of solutions is prepared and the suggestions provided by each member are given a ranking starting from the highest to the lowest. The solution with the highest rank is considered to be the best solution.
- Quantitative forecasting: The demand for can be forecasted by using various quantitative techniques. The following are four main key quantitative methods to forecast patient demand:
 - Managerial input: It is an approach in which top management and departmental managers evaluate the number of people required to complete a particular task. This approach is commonly used by small-scale hospitals. In this approach, the demand for patients is estimated on the basis of suggestions given by top management and assessed by the functional heads of all the departments of the hospital.
 - **Statistical methods:** It involves techniques in which the patient data of the hospital is analysed. With advancement in technology, it has become much easier for hospitals to evaluate a large amount of data. The following are some statistical methods that are used to forecast future patient demand of the organisation:
 - Ratio and trend analysis: It is a method in which patient requirements of the hospital are forecasted by computing the ratio of past data of production and sales. This method considers changes that can take place in the number of employees in the future. The exact ratios can be calculated if the past records are accurate.
 - Regression analysis: It refers to the method in which patient demand is forecasted by establishing a relationship between various business factors and existing patient size. These business factors can be sales, output, profit, productivity, and number of existing patients. In this method, an analyst forms regression equations using different variables and these equations are solved with the help of statistical software.
 - Bureks-Smith model: It is a statistical model for estimating patient requirements of the organisation based on some specific factors. These specific factors are directly related to the patient's needs of the organisation. The equations used in this model for forecasting patient demand are as follows:

En = [(Lagg + G) 1/X] /Y

CHAPTER 9 \blacksquare Managing Productivity and Measuring Performance

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Where,

- $E_{n} = Estimated patient requirement$
- n= Planning period
- Lagg= Level of current business activity (in rupees)
- G= Total growth of the hospital during period n
- X = Average improvement in productivity
- Y= Conversion figure that denotes the relationship between the current business activities and workforce required
- Group brainstorming: In this method, experts hold face-to-face discussions with employees, scrutinise the strategic plans of the hospitals, and finally anticipate the future requirements of patients.

🔽 Self-Assessment Questions 🗎

- 1. _____ implies predicting about the future.
- Expert opinion is a structured and systematic technique in which questions are individually asked from experts to obtain their opinions on various future events. (True/False)
- **3.** _____ is a statistical model for estimating patient requirements of the organisation based on some specific factors.

9.3 Capacity Analysis and Utilisation

Capacity implies the amount of resources that are available to fulfil the demand. It means when the demand is known, the next step is to know how much capacity exists. In hospitals, the capacity can be measured in terms of multiple resources that include the following:

- Number of available beds, examination rooms and clinics
- Labour availability of physicians, nurses and other providers
- Availability of key medical technologies and equipment
- Elevators, hallways, and other facility space
- Support services such as cafeteria and parking

Capacity analysis involves understanding organisational resources such as labour, technology and facilities. For aligning capacity with demand, capacity planning is done. It analyses resources shortage and surplus at different points of time. Capacity planning involves five steps, which are as follows:

- 1. Forecasting patient demand
- 2. Translating demand into capacity requirements
- 3. Analysing the current level of capacity in terms of hours of labour
- 4. Estimating the change between capacity and demand
- 5. Developing a strategy for aligning capacity with demand

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Capacity utilisation needs familiarity of existing capability. Operation or the extent to which tools, space, or toil is presently being utilised is expressed like a proportion:

Operation=100 %*(standard productivity Rate/greatest aptitude)

The standard output rate in addition to the capability must be calculated in the similar conditions (time, patrons, units, otherwise dollars). The use rates specify the call for adding additional capacity or eradicating unnecessary aptitude.

The capacity constraints can overcome with the following strategies:

- Increasing capacity: It involves purchasing new capital equipment that allows the organisation to perform operations for a longer time period. Hospitals add capacity by hiring staff, adding beds, and increasing the square footage for new clinics.
- **Reduce demand:** Hospitals can reduce patient demand where it is profitable. This includes reducing services and redirecting patients to other hospitals.
- **Transferring capacity from other areas:** It means transferring capacity from other areas where it is not needed.

Self-Assessment Questions

- 4. What are the steps of capacity planning in hospitals?
- 5. Hospitals can reduce patient demand where it is profitable. (True/False)

Activity

Visit the nearest hospital and learn how the patient demand is forecasted.

9.4 Common Hospital-Wide Productivity Metrics and Work Standards

Most hospitals and health organisations require a metric system in order to determine its progress. The productivity metric system is important with respect to the health and care of patients. Work standards in hospitals must be according to the financial status of the health centre. Using low-cost methods or products can be risky for patients. Performance observation in an organisation, especially a hospital is very important, as patients depend on the staff and employees for safe services. Right use of productivity and performance measures can help the higher authorities in the hospital to improve the same.

In a hospital management unit, there are various kinds of metrics, which are implemented for the safety measures in the hospital. Performance is being measured in a hospital on a daily basis. Therefore, it is necessary for the management team to produce positive and effective productivity results. Some of the hospital metrics to name are:

- Process time of discharge
- Rate of patient complaints
- Health treatment or tests errors
- Medical disorders or errors
- Risk management

- Cost per patient discharge
- Physician productivity value
- Patient and employee satisfaction

Hospital staff and employees can work together as a team to develop a great understanding of the required information. Working closely with partner organisations helps to define hospital metrics and produce reports that are easily understood.

9.4.1 Work Standards in Hospitals

Health standards in hospitals and health organisations play a very important role in the health and safety. Factors like education on health-related measures helps in setting work standards in hospitals. The hospital team is required to maintain a highly managed, planned and an effective standard of work. A health organisation should review responsibilities, implementation, and evaluation of work standard policy on daily basis. Staff must be aware of the health policies and standards. Procedures and evaluation data should always be present with the hospital management team in order to measure the quality of health related activities.

9.4.2 Measuring Performance of Hospital Services

In order to improve and measure the performance of services in a hospital, it is necessary to point out the areas that are required to improve on. By doing this, it helps the team to perform much faster and easier. The organisation makes sure that the staff has sufficient information in order to perform their duties well. High-quality care and performance is a vital component of a healthy system in a hospital. As we all know that measurement of performance in any organisation is a central concept for quality improvement. It helps in identifying what exactly the hospital staff, employees, etc. are doing or how they work. Thus, looking for better opportunities for improvement is of utmost importance for a hospital. There are many ways in which performance measurement can be done. Some of them are given as follows:

- Analysing organisational priorities
- Choosing proper performance measures
- Evaluating performance
- Improving performance though planning
- Monitoring performance over time
- Making performance reliable and standardised

Extra precaution is needed when selecting any metric methods, keeping in mind the hospital's main goals. The hospital staff should ensure that the performance measures chosen should be meaningful and realistic. Healthcare performance measures should be conducted wisely in order to avoid any incidents. Safety and timely measures, providing effective & efficient services for patients, are very valuable. It is advisable to use the current and advanced data for measuring performance for more better and accurate results. Evaluating staff performance, on a timely basis, can also help hospital management to do effective improvement if required. After the performance data is measured or evaluated, the report that is being prepared should be well tailored in order for board members to understand the results easily.

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🔁 Self-Assessment Questions

- 6. Name some hospital metrics.
- 7. Work standards in hospitals must be according to the financial status of the health centre. (True/False)

9.5 Productivity Measures

On average, the efficiency of manufacturing is measured by productivity. The output to input ratio is the standard unit of measurement for this metric. Efficiency in the transformation of inputs into outputs is the essence of productivity measurement. An attitude of mind is what makes a person productive, says the European Productivity Agency (EPG). As a way of thinking, it is characterised by a relentless pursuit of betterment. Continuously improving one's performance is what it's all about. It is the ongoing process by which societal and economic activities adjust to new circumstances. It is the never-ending quest to implement novel approaches. The confidence in progress is what it is. Thus, productivity can be defined as the ratio of output to input. The following is a mathematical expression of it:

Productivity = Amount of output/Amount of input

Productivity measures are an essential part of any organisation. Certain factors that could affect the productivity of a hospital are as follows:

- Production and technology
- Capital investments in equipment
- Changes in the technological department
- Methods of working
- Product quality
- ♦ Management type
- Educational levels
- Social and geographic factors

The productivity in hospital nursing units is measured by Hours per Patient Day (HPPD)

HPPD= Total hours/ patient days

Let us take an example to learn this. In hospital A, 25 hours are required to treat patient who stayed for 5 hours. In hospital B, 16 hours are required to treat patient who stayed for 4 hours. Now, calculate which of the hospitals is more productive.

 $HPPD_{A} = 25/5 = 5 HPPD$

HPPD_B=16/4=4 HPPD

Thus, we can say that hospital B is more productive than hospital A.

In the above example, the inputs used are number of hours worked.

In general, the inputs in hospital productivity are physical and financial resources whereas the outputs include health services and outcomes.

🔁 Self-Assessment Questions 🕻

is measured as a ratio of output to input used in the production process.

9. HPPD stands for_____

9.6 Improving Productivity

Productivity improvement is easily achieved if the level of output is increased compared to that of the input. In order to manage the staff levels, the responsible team should take initiative in maintaining costs reduction and increase in efficiency. The productivity department team can apply a few key steps that can be effective in improving productivity, such as:

- Labour working hours management
- Maintaining budget overruns
- Implementing IT resources
- Preparing reports

Avoiding access to input of labour, products, technical usage, etc. can help in improving productivity in hospitals. Balancing over-budget staffing can also help in improving productivity in a hospital. Communication of staff with all levels of management with regard to the hospital productivity system can also produce good results. Hospitals should control discrepancy caused by under-staffing.

In order to sustain a good productivity plan in a health organisation, it is necessary to consider the balance between input and output required. Progress in diverse departments, such as purchasing department, materials department, etc. can make a huge positive difference. For maintaining a balanced productivity level, intelligent innovation can be handy if applied wisely.

Visual data analysis also helps in sharing and understanding ideas within the hospital staff. The hospital management staff and executives must help and support in encouraging good productivity. A professional productive environment can improve the productivity that could be beneficiary for all the hospital people.

Self-Assessment Questions

10. Communication of staff with all levels of management with regard to the hospital productivity system can also produce good results. (True/False)

9.7 Principles of Productivity Management

Every organisation has its rules and regulations for a smooth flow of work. Similarly, hospitals should also have principles in order to perform effectively. For successful productivity management, it is necessary to follow hospital principles. There are various ways or principles to maintain a balanced productivity management.

Certain principles that can improve efficiency in the productivity management in hospitals are as follows:

- Application of practical theory
- Decrease non-value activity

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- Utilise technology tools
- Recognise significance people or employees
- Implement new methods to develop staff skills
- Centre the main causes of any problem
- Reduce all the waste that is not required.

The above principles when applied in a hospital productivity management could help create a better and a healthy environment in a hospital, thus providing excellent patient care.

Health standards in hospitals and health organisations today play a very important role in the health and safety of hospital staff and employees. Enabling people to control over the health improvement can be very effective in raising the work standards of a hospital. Factors, such as education on health-related measures help in productive work standards in hospitals. Work standards in health organisations like a hospital, are very delicate matters. In order to provide standard and a healthy treatment to people, the hospital team is required to maintain a highly managed, planned and an effective standard of work. Staff must be aware of the health policies and standards. Procedures and evaluation data should always be presented with the hospital management team in order to measure the quality of health related activities.

🔁 Self-Assessment Questions

11. Give any two principles that help in improving efficiency of hospitals.

9.8 Work Measurement: Technique for Improving Productivity

By measuring its productivity, a hospital can determine its overall performance over a period of time and identify the areas of improvement. Apart from this, it helps hospital in the following ways:

- Increasing the reserve funds that can be used for expansion and modernisation
- Reducing overheads and various other costs per unit of output
- Improving the quality of products/ technologies used
- Increasing the competitive strength of the hospital

Typically, an organisation endeavours to enhance its productivity by either increasing production levels using fewer or the same resources, or by reducing resources whilst maintaining or elevating production levels. To achieve this, it employs the work measurement technique.

Work measurement involves utilising methods to ascertain the specifics of a job. The specifics of a job can only be gauged if the procedure for executing that job is standardised, a process facilitated by method studies. According to BSI, work measurement is "*The application of techniques designed to establish the time for a qualified worker to carry out a specified job at a defined level of performance.*"

In simpler words, work measurement is a method used to ascertain the duration required for a proficient worker to complete a task. This duration is referred to as the time standard, work standard, labour standard, production standard, or standard time. The standard time is articulated in minutes per unit of output or units of output per hour. Notes

Work measurement is essential for planning and controlling the operations of an organisation. This is because unless the work content is measured, it is hard to identify the capacity level of a production plant. In addition, work measurement is also used for introducing incentive schemes and standard costs for budget control as well as for achieving a high level of labour productivity. The following are the major objectives of work measurement:

- Improving the planning and controlling of operations
- Making work handling more effective
- Providing indices to measure labour performance
- Enabling an organisation to control its labour cost
- Making the incentive schemes better

There are many ways that can be applied to measure work performance in a hospital. Some of them are as follows:

- Developing the IT department
- Training of the staff in various different departments
- Maintaining the historical data of a patient
- Setting performance standards

The above ways prove to be very helpful in measuring the work in any organisation. Upgrading mechanical tools such as computer systems can be very helpful in maintaining patient's health record history. High level and standard techniques implemented in hospitals can input positive and effective results in hospitals.

9.8.1 Work Sampling

Work sampling is a method used to experiment the work done by workers. This kind of technique helps in finding out the amount of time a worker takes to complete his work/task given. Sampling of work gives a brief idea of how long an employee is really been working. In hospitals, usually the clerks, helpers, etc. are always idle and avoid work as much as possible. In order to track the working hours of the staff, work sampling is been done. No experts are required to perform the work sampling technique. Hospital, with their understanding can work as a team and do the work sampling.

Work sampling refers to a technique in which samples of work of one or more employees are collected at regular intervals. These samples help in determining the amount of time required for performing a particular activity. Work sampling helps an organisation in the following ways:

- Identifying the allowances to be included in the standard time
- Signifying the type of work activities to be included in a work sample
- Estimating the percentage of utilisation of groups of similar machines
- Indicating the use of material handling equipment
- Providing a basis for indirect labour time standards
- Identifying the productive and non-productive utilisation of clerical operations
- Determining the standard time for repetitive operations

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9.8.2 Calibration of Hospital Equipment

Medical equipment calibration is as important as any other services that a hospital provides. Calibration is a process that helps in checking and measuring an instrument against an exact standard to determine any deviation and correct for errors. In every year, hospitals are swamped with growing rate patients, it is compulsory to maintain medical equipment in top and working condition. For treatments like the diagnosis etc., patients depend on good quality of services from the hospital. Therefore, the doctors and the other hospital staff should be assured of the well maintenance of tools and equipment used. All the medical equipment should be working well. Repairing and maintaining medical equipment is equally important as any other service that a hospital provides for a peak performance and accurate results. Medical equipment should be checked and inspected on a regular basis and not only when a break down take place. Annual calibration services thus help in guarantying the peak performance of the medical equipment resulting in accurate reports.

Therefore, calibration of medical equipment can save time and money as it gives accurate result of any tests been taken or done.

🔁 Self-Assessment Questions

- **12.** _____ refers to an application of techniques for determining the content of a job.
- 13. How is standard time expressed?

9.9 HR Incentives Calculation and its Applications in Hospital

Incentives are generally performance-based compensation. They do not act as a burden for the financial health of the organisation, as they are recovered in terms of improved productivity. Incentives are more like an investment that encourage employees to show excellent performance. They also influence employees to improve their capacity to gain benefits above their regular compensation. The main advantages of incentive system are listed as follows:

- Encourages employees towards high performance goals
- Provides satisfaction to employees for extra efforts
- Induces other employees to perform better
- Prevents employee discontentment and supports their retention
- Develops ownership attitude among employees

In hospitals, HR incentives calculations are done on the following grounds:

- Entire discharges
- Entire gross profits
- Total aid concern charges
- Healthcare in patient days (fraction of a Fee for Amenity plus component C Medicare Benefit)
- Full inpatient days

The hospital department administers fringe benefits in the form of hospitalisation benefits. In addition to this, provident fund benefits, gratuity, retirement benefits, travel allowance benefits, housing benefits etc. are also provided. Notes

Note

Fringe benefits are the programs conducted for the benefit of employees. These are offered by employers and are not included in their wages or salaries. Fringe benefits can make up approximately 30 % of the total remuneration of employees.

🖄 Self-Assessment Questions

- 14. What are the components of the hospital incentives?
- Incentives influence employees to improve their capacity to gain benefits above their regular compensation. (True/ False)

9.10 Value Addition Service in Hospitals

Value Addition Services are extra 'non-core' activities that add worth to previously accessible services, for example foundation services. VAS adds to the development of the sickbay as such amenities change the dismayed hospital meet into an unforgettable and enjoyable experience.

VAS in healthcare surroundings is a region that is mostly unfamiliar. Important VAS in hospitals includes the following:

- Private birthing suites with all necessary medical requirements
- Baby friendly rooms such as paintings on walls, colour furniture, well-trained friendly staff, besides toys
- Free internet services for visitors and patients
- Medical tourism that involves visits at the home of patients
- Barrier-free atmosphere with ramps and handle-bars, lifts with braille switches and verbal announcement
- Other services such as ATM/banking services, florist, gift shop, book shop, fruit shop, postal/courier service.
- Membership programs that involve health card; health information and interactive health coaching and health education programs.

Self-Assessment Questions

16. VAS stands for_

17. Value Addition Services add worth to previously accessible services. (True/False)

9.11 Summary

- The different types of patient forecasting practiced in hospitals are qualitative forecasting and quantitative forecasting.
- The productivity of a hospital can be measured with the help of the formula:
- Hours Per Patient Day (HPPD) = Total hours/ patient days
- Work measurement is a technique that is used to increase the productivity of the organisations.

Notes

- The hospital department provides incentives such as fringe benefits, provident fund benefits, gratuity, retirement benefits, travel allowance benefits, housing benefits.
- Various value added services are provided in the hospitals to enhance the quality of patient and visitor visits.

9.12 Glossary

- Forecasting: It refers to the process of estimating the future events from the past data
- **Incentives:** These are performance-based compensation. They do not act as a burden for the financial health of an organisation as they are recovered in terms of improved productivity.
- **Productivity:** It measures how efficiently inputs are used to produce output.
- Value added services: These are extra services provided to enhance value of a product/ service/organisation.

9.13 Terminal Questions

- 1. Explain the concept of forecasting patient demand.
- 2. Discuss productivity measures used in hospitals. Also, give the principles of productivity management.
- 3. Explain a work measurement technique.
- 4. What are incentives? On what grounds, HR incentives in hospitals are calculated?
- 5. Give some value-added services provided by hospitals.

9.14	Answers
Q.	Self-Assessment Questions
1.	Forecasting
2.	False
3.	Bureks-Smith model
4.	Capacity planning involves five steps, which are as follows:
	1. Forecasting patient demand
	2. Translating demand into capacity requirements
	3. Analysing the current level of capacity in terms of hours of labour
	4. Estimating the change between capacity and demand
	5. Developing a strategy for aligning capacity with demand
5.	True
6.	Some or the hospital metrics are process time of discharge, rate of patient complaints, health treatment or tests errors and medical disorders or errors.
7.	True
8.	Productivity
9.	Hours per Patient Day

CHAPTER 9 \blacksquare Managing Productivity and Measuring Performance

10.	True
11.	Principles that can improve efficiency in the productivity management in hospitals are as follows:
	1. Application of practical theory
	2. Decrease non-value activity
12.	Work measurement
13.	The standard time is expressed in minutes per unit of output or unit of output per hour.
14.	The hospital department administers fringe benefits in the form of hospitalisation benefits. In addition to this, provident fund benefits, gratuity, retirement benefits, travel allowance benefits, housing benefits etc. are also provided.
15.	True
16.	Value Addition Services
17.	True
Q.	Terminal Questions
1.	Forecasting patient demand minimises the waiting time and improves customer service Refer to section 9.2 Forecasting Patient Demand .
2.	Productivity is the ratio of output to input. Refer to section 9.5 Productivity Measures and 9.7 Principles of Productivity Management.
3.	Work measurement refers to an application of techniques for determining the content of a job Refer to section 9.8 Work Measurement: Technique for Improving Productivity.
4.	Incentives do not act as a burden for the financial health of the organisation, as they are recovered in terms of improved productivity. Refer to section 9.9 HR Incentives Calculation and its Applications in Hospital .
5.	Value Addition Services are extra 'non-core' activities that add worth to previously accessible services, for example foundation services. Refer to section 9.10 Value Addition Service in Hospitals .

9.15 Case Study: Productivity Issues at Marlborough Hospital

NOTES

Marlborough Hospital was not very different from what generally healthcare organisation lag-technology. Every Friday afternoons and Monday mornings, the hospital management persons & nurses got busy in running their payroll numbers. Since salary is important part of work culture so important patient care duties were kept on hold and nobody questioned about it. Additional time spent working on papers schedules decreased overall efficiency. The productivity date with respect to staff performance and patient care was only available at the end of month when it was too late. Slowly the Marlborough Hospital began to lose its reputation in the market. The demand of time was a productivity solution.

The management started searching for a solution through their consultant and soon found the solution. The hospital implemented an enterprise productivity management solution from McKesson called ANSOS One-Staff TM. This situation changed with better visibility into their workforce, reduce agency staffing costs, managers were able to meet regulatory

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requirements, and make staffing decisions based on real-time data. Now payroll processing is job of minutes as compared to previous condition in which it took 3 days to do the same job. Now, there is clear visibility into how many people are providing care, attending training. Enterprise software changed the total outlook of the Marlborough Hospital and increased the productivity to new heights.

Discussion Questions

1. What was the solution implemented by Marlborough Hospital to increase productivity?

(Hint: Software called ANSOS One-Staff was installed)

2. According to you, what other changes can be done to revamp the reputation of Marlborough Hospital.

(Hint: VAS can be provided)

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CHAPTER

10

Healthcare Finance for Operations Manager

Struc	eture	
10.1	Introduction	
	Learning Objectives	
10.2	Capital Operations in Healthcare Sector	
10.3	Profit Margins	
10.4	Income Statement	
10.5	Balance Sheet	
10.6	Working Capital	
10.7	Financial Distress in Healthcare	
10.8	Cash Flow Statement	
10.9	Debt in Healthcare	
10.10	Summary	
10.11	Glossary	
10.12	Terminal Questions	
10.13	Answers	
10.14	Case Study: Narayana Hrudayala Hospitals for Cardiac Care - An Example of Efficient Financial Operations and Quality Health Care at Affordable Cost	
10.15	References and Suggested Readings	
Notes

Learning Objectives

After completing this chapter, you will be able to:

- **Explain** capital operations in healthcare sector
- Discuss about the profit margins of a hospital
- □ Identify the importance of income statement
- **D** Explain the significance of balance sheet and cash flow statement
- **List** the requirements of working capital in a hospital
- Discuss financial distress in healthcare
- Describe debts in healthcare

10.1 Introduction

Hospitals are colossal and multifaceted organisations that often lack sophistication in operational activities that technology can endow them with. Owing to this gap, they often tend to register dwindling profit margins. This necessitated the establishment of an operations management committee who were bestowed with the responsibility to monitor the activities of Hospitals, manage its finances and finally etch out the maximum output from qualitative and quantitative aspects of management.

Healthcare financial management, therefore, is a very interesting subject of study. It provides operational managers with necessary tools to run the hospital efficiently without any financial hurdles. The MIS reports of daily financial positions help the top management in making informed operational decisions during emergencies. Owing to the growing need for customisation and add on services, healthcare organisations, today, use complex tools to manage accounting and finances. The fast changing acts and applicable taxes require managers to be on their toes to remain updated on every aspect of hospital financial management down to the minute details.

The role of healthcare financial management is to plan resources, acquire and utilise capital funds, and maximise efficiency and market value of the hospital. In addition to this, finance managers in the healthcare sector are also responsible for monitoring investment activities, planning cash management approach, and implementing plans efficiently. In this chapter, you will study about healthcare financial management in detail.

10.2 Capital Operations in Healthcare Sector

Capital funds are the strongest pillars that support the healthcare industry. In a hospital, these funds are used to purchase vital assets like buildings, factories, medical equipment; reduce manual labour; and upgrade existing equipment and assets. It is with the help of capital funds that hospitals and healthcare agencies can increase their efficiency, improve their quality of services provided, and help patients recover completely. Therefore, it is of utmost importance for a hospital to manage its capital funds optimally. Most hospitals hire capital operation specialists/managers who are responsible for understanding the inflow of capital funds from various sources and ensuring the appropriate allocation of these funds into relevant buckets so as to leverage optimal gain from them.

10.2.1 Identifying Capital Fund Sources

Capital funds are sourced from different establishments for specified periods varying between long term (more than 7 years), medium term (from 2 to 7 years), and short term (less than 2 years). Some of the common sources for availing capital funds include:

- ♦ Government agencies
- Contributions from organisations
- Donations from foundations
- Lending agencies or individuals
- Equity firms
- Investment banks

10.2.2 Role of a Capital Operations Manager

A capital operations manager deals with several crucial aspects that profoundly impact the functioning of a hospital or healthcare setup. Thus, he/she is required to take into consideration the requirements of every internal department of a hospital before making any decisions. In order to facilitate that, frequent and elaborate interactions need to take place between capital operations team and various internal departments as well as vendors to coordinate, manage and execute responsibilities satisfactorily.

In a hospital, a capital operations manager should be:

- ◆ Approachable with the ability to develop healthy peer relationship: A capital operations manager should be able to connect with peers and department heads. He/ she should also be approachable enough for people to reach out to him for discussing capital fund-related issues.
- ◆ Adept in functional and technical skills: A capital operations manager needs to plan and schedule timelines & milestones, understand various benefits of products being offered by vendors, monitor implementation, and track billing accuracies. Therefore, it is very crucial that the relevant individual straddling this profile possesses sound functional knowledge and strong technical acumen to be able to handle his/her job well.
- Able to generate effective results: A capital operations manager should always be focused towards generating the optimum results.

10.2.3 Designing a Capital Planning and Implementation Project

One of the key responsibilities of a capital operation manager is to perform effective capital allocation planning and project implementation. Designing a capital allocation plan is becoming increasingly tricky with the growing need to cut-down on costs, work under stringent regulatory requirements and yet deliver improved quality of services.

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The focus, therefore, in every capital planning and implementation project is on the organisation's vision and mission statement which helps to define the way forward for every project. In order to gauge whether the organisation's mission statement is being interpreted accurately, specific goals and objectives that are measurable, need to be defined. These goals and objectives should be designed to address the organisation's strategic objectives as well as the project team's performance.

As a logical conclusion, every capital allocation planning and implementation process should include a mechanism to record feedback. These could be either through Project status reports (PSR) that help to achieve essential key performance indicators (KPIs) or through knowledge management tools like After Action Review (AAR) reports that help to inculcate accountability and insight.

Fig. 10.1 shows the pyramid comprising factors to be considered during capital allocation projects:



Fig. 10.1: Factors to be Considered during Capital Allocation Projects (Source: http://www.bdcnetwork.com/how-develop-healthcare-capital-project-using-true-north-charter)

🔁 Self-Assessment Questions

- 1. ______ are used to purchase vital assets like buildings, factories, medical equipment; reduce manual labour; and upgrade existing equipment and assets.
- 2. A capital operations manager should always be focused towards generating the optimum results. (True/False)
- 3. Discus the key responsibilities of a capital operation manager.

Activity

List the possible goals and objectives of a healthcare facility that could be used in designing a capital allocation plan.

10.3 Profit Margins

For every business, profits are estimated after subtracting income from expenses. The profit gained, commonly known as profit margin, refers to the surplus funds left after paying off all expenses, including the salary of employees and other hospital expenditures like tax, among other things.

Since 1980, the healthcare segment has been known to have registered the lowest profit margins among other industry segments. The industry records an average profit margin of

CHAPTER 10 \blacksquare Healthcare Finance for Operations Manager

3-5%. USA, where healthcare is the most expensive sector reports an overall profit margin of 15.4% with health plans reporting the lowest margins of 3.2%. Fig. 10.2 shows the health sector profit margins earned by individual healthcare segments in the USA:



(Source: http://www.pnhp.org/news/2014/september/8-facts-that-explain-what%E2%80%99s-wrong-with-american-health-care)

10.3.1 Profit Margins - A Reactive Response to Changes in Supply and Demand Dynamics

Profit margins registered by hospitals and healthcare facilities are largely affected by the evolving changes in supply and demand. In the 1990's, the surge in the supply of hospitals and healthcare facilities, including hospital beds and equipment were met with moderate demand in terms of hospital admissions and drug demands. In the new millennium, health consciousness gradually gained momentum and hospitals recorded an increase in the number of admissions. Moreover, the number of outpatients demanding medical facilities also witnessed a remarkable increase in volume. However, the supply of healthcare facilities had been consolidated and did not witness any jump in numbers. This resulted in profit margins being pushed lower.

However, having overcome the initial tumultuous years, healthcare facilities have stabilised their supply and their prices. This has helped to push profit margins once again to move up the incline. Since 2004, therefore, hospitals have witnessed a healthy increase in profit margins.

However, with the evolution of new age technologies, medical equipment and devices are being overhauled. As a result, hospitals are incurring additional capital costs for purchasing and installing equipment as well as for building relevant infrastructure to support these new installations. Though incurred with the greater intention to provide better and enhanced quality service to their patients, however, the increasing costs lead hospitals to suffer receding profit margins. Hospitals, therefore, are faced with a serious challenge to reduce costs to generate healthy profit margins and yet provide quality services to their patients.

🔁 Self-Assessment Questions

- For every business, profits are estimated after subtracting expenses from income. (True/False)
- 5. _____ refers to the surplus funds left after paying off all expenses, including the salary of employees and other hospital expenditures.

Activity

If you were to be given the responsibility to control profit margins in a healthcare facility, list out the factors you would have considered for controlling costs, maintaining quality, and increasing profit margins.

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10.4 Income Statement

Income statement, also called profit and loss statement, is a financial document that states an organisation's financial position in monetary terms. Income statement along with cash flow statement and balance sheet are the three crucial documents that help in analysing the financial position of a hospital. It provides an insight into relevant metrics and line items that facilitate an easy comprehension of a hospital's overall operation.

A hospital performs a host of operating and non-operating activities. The health of its business is accurately assessed by analysing the revenue and expenses incurred through its performance. The income statement helps to summarise this information. Fig. 10.3 displays a sample income statement generated by hospitals:

Hospital Income Statement

INCOME STATEMENT (in thousands)

	1999	1998
OPERATING REVENUES		
Gross Patient Service Revenue	\$258,125	\$263,469
Free Care	5,800	6,024
Contractuals	69,320	67,985
Net Patient Service Revenue	183,005	189,460
Other Operating Revenue	14,600	14,843
Total Operating Revenue	\$197,605	\$204,303
OPERATING EXPENSES		
Depreciation	13,152	13,805
Interest	3,222	5,026
Bad Debt	5,163	6,866
Other Operating Expenses	168,585	173,634
Total Operating Expenses	\$190,122	\$199,331
Net Operating Income	\$7,486	\$4,972
NONOPERATING REVENUE		
Investment Income	\$2,530	\$3,328
Gains/Losses	159	0
Other Income (Expenses)	470	1,112
Total Nonoperating Revenue	\$3,159	\$4,440
Excess Revenues over Expenses	\$10,645	\$9,412
OTHER GAINS (LOSSES) DUE TO:		
Extraordinary Gains (Losses)	0	-748
Total Surplus/Deficit	\$10,645	\$8,664

Fig. 10.3: Hospital Income Statement

(Source: http://www.intellectualtakeout.org/library/chart-graph/hospital-income-statement)

10.4.1 Revenue Earners for Hospitals

Hospitals have various channels to earn revenue. In addition to offering medical and nonmedical services, hospitals also accept government grants, donations from individuals and organisations and finally utilise investments to earn revenue. Notes

Hospital income statements, therefore, sums up these varied sources under three heads, which are:

- **Operating revenue:** This refers to income earned from delivering the core activity of hospitals, i.e. patient care, which is the primary means of revenue collection. This can be further broken down to indicate Gross Patient Service Revenue (GPSR) representing payments made by patients for the care they receive and the Net Patient Service Revenue (NPSR), which is the total money actually collected after calculating all relevant adjustments like charity care.
- Non-operating revenue: This refers to income earned from several non-patient activities that the hospital undertakes. Thus, it is also known as other operating revenue. Though not connected to its core area, it does contribute significantly to a hospital's fund bank. They include the following types:
 - Sale proceeds from cafeteria products
 - Sale proceeds from gift shops
 - Parking fees
 - Rent for space or equipment
 - Research grants
- ◆ Gains/losses: This refers to the income generated from activities that are peripheral to the core areas of a hospital. Also known as non-operating gains or losses, it includes revenue earned from the following sources:
 - Marketable securities
 - Donations
 - Shares in affiliated organisations
 - Income from investments

10.4.2 Understanding Hospital Expenses

Contrary to the common belief that hospitals are easy revenue earners, they do face a tough challenge in managing its myriad expenses and yet rake in a healthy profit margin. With the advancement of technology and an increase in sophistication in the healthcare sector, more and more patients expect superior service from hospitals. With an abundance of options to choose from, patients expect that hospitals should be kept on their toes in meeting their demands. Consequently, hospitals cannot compromise on salaries and supplies which figure as significant expense heads in their statements. In addition to this, hospitals also include amortisation, rates of interest, bad debt expenses, and depreciation as their areas of expenses. Fig. 10.4 illustrates the breakdown of hospital expenses:





(Source: http://www.intellectualtakeout.org/library/chart-graph/breakdown-hospital-expenses?library_node=70586)

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Though the percentage segregation depicted in the figure above may vary, depending on which category the specific hospital assigns higher priorities, the expense categories; however, are more or less the same.

🔁 Self-Assessment Questions

- 6. _____, is a financial document that states an organisation's financial position in monetary terms.
- 7. Name the three crucial documents that help in analysing the financial position of a hospital.
- 8. Hospital income statements, therefore, sums up these varied sources under three heads, which are ______, ____, and _____.
- **9.** Operating revenue refers to income earned from several non-patient activities that the hospital undertakes. (True/False)

10.5 Balance Sheet

As mentioned in the preceding section, the balance sheet is one of the three vital documents working to help one understand the accurate financial position of a hospital. It is a snapshot of all the assets and the liabilities of a hospital, which helps in indicating the hospital's financial health. Fig. 10.5 displays a sample balance sheet:

Period Ending	Dec 31, 2013	Dec 31, 2012	Dec 31, 2011
Assets			
Current Assets			
Case And Case Equivalents	637,900	85,000	126,200
Short Term Investments	-	-	-
Net Receivables	743,400	661,300	556,300
Inventory	102,000	97,000	87,200
Other Current Assets	110,900	82,000	70,300
Total Current Assets	1,594,200	925,300	840,000
Long Term Investments	-	-	-
Property Plant and Equipment	2,197,200	2,030,900	1,830,400
Goodwill	1,651,000	1,611,800	1,568,700
Intangible Assets	72,600	84,500	89,500
Accumulated Amortization	40.700	47.800	10.800
Other Assets Deferred Long term Asset Charges	40,700	#1,800	19,800
Total Assets	5,586,800	4,722,200	4,370,100
Liabilities			
Current Liabilities			
Accounts Pavable	275.500	245.600	202.700
Short Current Long Term Debt	583,000	13 300	1 900
Other Current Liabilities	197,200	186,000	168,200
Total Current Liabilities	1.055.700	444.900	372.800
Long Term Debt	1.793.800	1,696,500	1.595.400
Other Liabilities	211,800	229,100	157,100
Deferred Long Term Liability Charges	233,100	249,200	259,000
Minority Interest	22,500	22,600	14,400
Negative Goodwill	-	-	-
Total Liabilities	3,316,900	2,642,300	2,398,700
Stockholders' Equity			
Misc Stock Options Warrants	59,800	29,400	26,200
Redeemable Preferred Stock	-	-	-
Preferred Stock	-	-	-
Common Stock	700	600	600
Retained Earnings	1,347,000	1,218,800	1,065,900
Treasury Stock	(511,700)	(572,600)	(477,100)
Capital Surplus	1,470,700	1,403,500	1,354,800
Other Stockholder Equity	3,400	200	-
Total Stockholder Equity	2,210,100	2,050,500	1,945,200
Not Tangible Assots	486 500	854 900	987.000

Fig. 10.5: Sample Balance Sheet (Source: http://finance.yahoo.com/q/bs?s=LPNT+Balance+Sheet&annual)

10.5.1 Key Factors of Balance Sheet

In order to understand how to read a balance sheet and comprehend its full implications, it is important to educate oneself on the key factors and components of a balance sheet.

Every balance sheet displays main assets, liabilities of the organisation and the appropriate balance between the two. For any organisation, the financial health is said to be sound if its total assets are greater than total liabilities. In the absence of which, the organisation will not be able to sustain. However, if liabilities appear to be lagging behind by a huge margin, it indicates an inappropriate utilisation of assets. Therefore, maintaining a perfect balance between assets and liabilities in the balance sheet is a secret behind building credibility for the hospital's financial performance.

The formula to build a balance sheet can be defined as:

Assets = Liabilities + Equities or Net Assets

Paraphrasing the equation will help to highlight the significance of individual components.

- Assets refer to resources that are used by hospitals to leverage future benefits. Assets are of two kinds. Current assets are those that are used within a year like cash or short term investments; and non-current assets are those that do not have a defined tenure of usage and may be used for longer periods. Long-term investments are a common example of non-current assets.
- Liabilities refer to economic obligations that hospitals owe to external parties. Accounts payable is a good example of liabilities that figures on the balance sheet. Like assets, liabilities can also be categorised as current liabilities that need to be paid out within a year and non-current liabilities that continues for a longer period. Accrued salary payable, wages, payroll, and short-term obligations are some examples of current liabilities. Some examples of non-current liabilities include post-retirement health benefits, long-term obligations, deferred gift annuities, mortgage, etc.
- Net assets or equities refer to residual interest or claims remaining after all deductions on liabilities have been computed. It is also known as the owner's equity or fund balance.

🔁 Self-Assessment Questions

- 10. ______ is a snapshot of all the assets and the liabilities of a hospital, which helps in indicating the hospital's financial health.
- **11.** If liabilities appear to be lagging behind by a huge margin, it indicates an inappropriate utilisation of assets. (True/False)
- 12. Assets are of two kinds ______ and _____
- 13. _____ refer to economic obligations that hospitals owe to external parties.
- Accounts payable is a good example of liabilities that figures on the balance sheet. (True/False)
- **15.** _____ refer to residual interest or claims remaining after all deductions on liabilities have been computed.

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10.6 Working Capital

A hospital's working capital is the fund left over for use after deducting all current liabilities from current assets. A good working capital figure signifies sound operational efficiency of the hospital. It is also a helpful quantifier as how a hospital has been performing. Too high working capital ratio indicates that the hospital's assets, mainly their inventory, have not been utilised in the most favourable manner. A ratio too low, on the other hand, indicates an increase in current liabilities rendering them incapable of paying their creditors, often leading to closing down of hospital facilities.

10.6.1 Managing Capital for Productive Results

Hospitals require a basic cash flow to function efficiently. Every hospital is under intense financial pressure to maintain specific standards, offer credits to customers, maintain cash balances to handle emergencies, and maintain appropriate level of inventory. Moreover, working capital ratios need to be favourable in order to make lenders, both existing and prospective ones comfortable enough to proceed with loans. This makes it imperative to follow a thorough practice of working capital management to generate the most productive results.

It has been proved that by displaying efficiency in managing their working capital, hospitals have been successful in reducing their holding of current assets. These include mainly cutting down on their inventories and account receivables. The cash flow that results from this could be utilised to purchase financial instruments that bear healthy interests or can also be used to reduce the need for short-term borrowings. As a higher volume of account receivables and available inventories tend to mar the possibility of earning through interests and lead hospitals to enter into short term debts, curtailing these through effective management is a good way to generate productive results.

Self-Assessment Questions

- **16.** Define hospital's working capital.
- 17. A hospital's ______ is the fund left over for use after deducting all current liabilities from current assets.
- **18.** Working capital ratios need to be favourable in order to make lenders, both existing and prospective ones comfortable enough to proceed with loans. (True/False)

10.7 Financial Distress in Healthcare

In today's scenario, hospitals are facing huge financial difficulties, which lead to low availability of cash flow and high debts. This is a cause of financial distress of the healthcare sector. Distressed hospitals paint a poor picture in the healthcare canvas. There is a need to prioritise on finding an ideal resolution to this crisis. However, in order to do that, it is important to understand the reasons that lead to this distress.

10.7.1 Identifying Reasons for Financial Distress in Healthcare

One of the primary reasons for the increasing financial crisis in the healthcare sector is the technological advancements, which have led to the emergence of more sophisticated equipment and devices. Consequently, hospitals intending to keep up with the current pace Notes

needs to install advanced equipment and offer their patients with quality experience. However, this leads them to incur additional cost on recruiting and training their resources to use equipment. As a result, overall costs of hospitals tend to shoot up considerably.

The dismal state of the world economy has made the situation bleak for the healthcare sector. Reimbursements from government run medical welfare and insurance programs have trickled down to negligible amounts. This makes situations increasingly difficult for hospitals leading them to increase their cost of supplies and services in order to meet other costs.

Moreover, modern medicines are equipped to minimise the need for patients to prolong their stay in hospitals. Therefore, with a decrease in inpatient stays, hospitals are left with no option but to incur debts in order to support their costs.

10.7.2 Resolving Financial Distress

One of the best ways to control distress and ensure financial viability is to monitor costs and control expenses. Hospitals incur the highest expenses in the purchase and maintenance of labour and supplies. Estimating accurate productivity figures for individual departments in the hospital can help to control labour costs considerably. Productivity figures and their relevant parameters vary between departments. While the surgery unit measures productivity hours per surgical minute, productivity hours in the laboratory is measured by the number of tests performed. Monitoring these productivity factors will help hospitals to ensure how to avoid over staffing or under staffing individual departments and thereby controlling labour costs.

Moreover, efficient utilisation of hospital resources, including supplies and equipment is another way to control costs. Hospitals can build teams to supervise resource consumption and control costs without hampering the quality of service.

Hospitals should encourage their management to practice transparency in hospitals finances. Generating monthly financial statements or holding annual public meetings to discuss their financial performance can help to build transparency. This helps hospitals in predicting their financial future and planning or formulating their strategies and roadmap. This also acts as an alert watch on possible bankruptcy and helps hospitals to pull up their socks before being forced to close down.

Financial distress can impact a hospital's performance adversely. It not only drains their funds, but also breaks down the zeal of its employees; thereby affecting their productivity negatively. The hospital operations management should monitor potential aspects that may lead to distress and work towards finding an appropriate resolution to the problem.

🔁 Self-Assessment Questions

- **19.** One of the primary reasons for the increasing financial crisis in the healthcare sector is the technological advancements, which have led to the emergence of more sophisticated equipment and devices. (True/False)
- **20.** What is the best ways to control distress and ensure financial viability in healthcare industry?
- Hospitals incur the highest expenses in the purchase and maintenance of labour and ______.

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Activity

If you are the CFO of a healthcare facility, what would be your plan of action to save your facility from being bankrupt owing to poor financial performance?

10.8 Cash Flow Statement

A cash flow statement shows the movement of cash within and outside an organisation. It reflects changes in the balance sheet accounts and shows the effect of income on cash and cash equivalents. It only includes cash-related activities. All other kinds of activities appear as a footnote at the end of the document.

A cash flow statement of a hospital provides insight into its financial performance. It breaks down cash analysis into three specific activity types:

- Cash used for investing activities
- Cash used for financing activities
- Cash used for Operating activities

Fig. 10.6 illustrates a sample cash flow statement prepared for hospitals:

STATEMENT OF CASH FLOWS

\$10,645
13,152
6,480 –4,295
\$25,982
-7,854
2,702
-7,087
-4,300
\$9,443

Fig. 10.6: Cash Flow Statement

(Source: http://www.accessproject.org/downloads/Hospital_Finance.pdf)

The cash flow statement is also an interesting and intuitive way to gain information on the other sources of revenue models that the hospital follows. As shown in the sample statement in Fig. 10.6, hospitals often forge affiliations or associations with other hospitals in order to facilitate smooth performance of some of their functions. For the purpose, funds are often transferred between the affiliates. It is crucial; therefore, to reflect any transfer of funds on this account in the cash flow statement in order to be able to explain gaps in an organisation's profitability.

10.8.1 Intended Audience for Cash Flow Statement

A cash flow statement is a crucial document that is perused and scanned diligently by a specific group of hospital personnel. These include the following:

- Accounting team: Personnel from this team use the statement to understand the capability of a hospital to meet payroll requirements and other expenses.
- **Potential lenders or creditors:** These are individuals external to the hospital's operations, but who nonetheless are interested in the hospital's ability to repay loans.
- Potential investors: These are external individuals interested in associating with the hospital through investments and therefore would need to ascertain the hospital's financial stability.
- Potential employees or contractors: These are individuals who are on the verge of joining the hospital's payroll and would be keen to know whether they can afford their compensation.

10.8.2 Use of Cash Flow Statement in Planning Growth Models

Hospital administrators are often tasked with the need to plan future expansions for business growth. A cash flow statement is a financial tool that helps them plan those growth models. This might include constructing a new wing of the hospital or purchasing latest equipment. For each of these, information on fund availability is essential in helping them to take appropriate decisions. The cash flow statement helps them understand the status of ready cash in the hospital's coffers. The statement is equipped to enable hospitals leverage the following benefits:

- Estimate the duration, timing and feasibility of availing financing while laying out expansion plans
- Schedule and coordinate between availing funds and undertaking other activities
- Predict the need for credit and plan in advance

🖄 Self-Assessment Questions

- **22.** A ______ shows the movement of cash within and outside an organisation.
- 23. Cash flow statement breaks down cash analysis into three specific activity types. Name the three types.
- **24.** ______ are individuals external to the hospital's operations, but who nonetheless are interested in the hospital's ability to repay loans.
 - a. Accounting team
 - b. Potential lenders
 - c. Potential investors
 - d. Potential employees

Notes

Notes

10.9 Debt in Healthcare

Debt is a practice where one organisation borrows money from another in order to meet large expenses, which it is unable to pay out from its own account at the moment. Repayment of debt is ensured at the time of borrowing and is always accompanied by an additional amount levied as an interest. The examples of debts may include loans, bonds, and commercial papers.

Hospitals accrue debts when patients are unable to pay up, partially or wholly, for the services they have availed. Debts in healthcare are gradually assuming huge proportions. Healthcare providers are finding it increasingly challenging to recover debts accrued over a prolonged period of time. Some common reasons for the accrual of debts include:

- Unemployment
- Spiralling costs of health insurance plans
- Individuals declaring to have gone Bankrupt
- Foreclosures

The economic down slide experienced in most countries are forcing employers to shift the burden of healthcare costs on to their employees. As a result, the numbers of self-pay patients are on the rise that wilts under the pressure of soaring medical costs leading hospitals to run into bad debts.

For example, in France, the hospital bad debts attribute to around 4–5% of the total revenue earned from patients.

Hospitals need to follow three essential steps in order to control the accumulation of bad debts:

- 1. The operations team should get into details of the case at hand and analyse both its medical as well as demographic aspects.
- 2. The hospital operation should get acquainted with the patient and build up their own comfort zone with the patient so as to make it easier for them to approach him/her during collection if required.
- **3.** Operations personnel should identify appropriate time to escalate the matter and raise their concerns immediately. Most bad debts tend to accrue owing to the inability of doctors and healthcare professionals to make the right approach owing to inhibitions.

Self-Assessment Questions

- **25.** Repayment of debt is ensured at the time of borrowing and is always accompanied by an additional amount levied as an ______.
- **26.** ______ is a practice where one organisation borrows money from another in order to meet large expenses, which it is unable to pay out from its own account at the moment.

10.10 Summary

- With the help of capital funds that hospitals and healthcare agencies can increase their efficiency, improve their quality of services provided, and help patients recover completely.
- Capital funds are sourced from different establishments for specified periods varying between long term (more than 7 years), medium term (from 2 to 7 years), and short term (less than 2 years).

NOTES

- A capital operations manager deals with several crucial aspects that profoundly impact the functioning of a hospital or healthcare setup.
- One of the key responsibilities of a capital operation manager is to perform effective capital allocation planning and project implementation.
- Profit margins registered by hospitals and healthcare facilities are largely affected by the evolving changes in supply and demand.
- Income statement, also called profit and loss statement, is a financial document that states an organisation's financial position in monetary terms.
- Income statement along with cash flow statement and balance sheet are the three crucial documents that help in analysing the financial position of a hospital.
- Hospital income statements, therefore, sums up these varied sources under three heads, which are:
 - Operating revenue
 - Non-operating revenue
 - Gains/losses
- Every balance sheet displays main assets, liabilities of the organisation and the appropriate balance between the two.
- Assets refer to resources that are used by hospitals to leverage future benefits.
- Liabilities refer to economic obligations that hospitals owe to external parties.
- Net assets or equities refer to residual interest or claims remaining after all deductions on liabilities have been computed.
- A hospital's working capital is the fund left over for use after deducting all current liabilities from current assets.
- In today's scenario, hospitals are facing huge financial difficulties, which lead to low availability of cash flow and high debts.
- One of the primary reasons for the increasing financial crisis in the healthcare sector is the technological advancements, which have led to the emergence of more sophisticated equipment and devices.
- A cash flow statement shows the movement of cash within and outside an organisation. It reflects changes in the balance sheet accounts and shows the effect of income on cash and cash equivalents.
- Debt is a practice where one organisation borrows money from another in order to meet large expenses, which it is unable to pay out from its own account at the moment.
- Hospitals accrue debts when patients are unable to pay up, partially or wholly, for the services they have availed.

10.11 Glossary

- Assets: It refers to resources that are used by hospitals to leverage future benefits.
- Income Statement: It is a financial document that states an organisation's financial position in monetary terms.

Notes

- Healthcare Financial Management: It provides operational managers with necessary tools to run the hospital efficiently without any financial hurdles.
- Liabilities: It refers to economic obligations that hospitals owe to external parties.

10.12 Terminal Questions

- 1. What are the benefits that can be leveraged from a hospital's cash flow statement?
- 2. How can the operations team work towards addressing financial distress?
- 3. How can you effectively utilise working capital to generate productive results?
- 4. What are the principal components of a balance sheet?
- 5. How does an income statement work as an effective tool in determining the financial health of a hospital?
- 6. What are the factors affecting a hospital's profit margins?

10.13	Answers
Q.	Self-Assessment Questions
1.	Capital funds
2.	True
3.	One of the key responsibilities of a capital operation manager is to perform effective capital allocation planning and project implementation.
4.	False
5.	Profit margin
6.	Income statement
7.	Income statement along with cash flow statement and balance sheet are the three crucial documents that help in analysing the financial position of a hospital.
8.	Operating revenue, Non-operating revenue, and Gains/losses
9.	False
10.	Balance sheet
11.	True
12.	Current assets and non-current assets
13.	Liabilities
14.	True
15.	Net assets or equities
16.	A hospital's working capital is the fund left over for use after deducting all current liabilities from current assets.
17.	Working capital

CHAPTER 10 Healthcare Finance for Operations Manager

18.	True
19.	True
20.	One of the best ways to control distress and ensure financial viability is to monitor costs and control expenses.
21.	Supplies
22.	Cash flow statement
23.	Cash flow statement breaks down cash analysis into three specific activity types, namely cash used for investing activities, cash used for financing activities, and cash used for operating activities.
24.	b. Potential lenders
25.	Interest
26.	Debt
0	Terminal Auestions
X .	Terminal Questions
2. 1.	A cash flow statement helps in analysing the hospital's financial performance. Refer to section 10.8 Cash Flow Statement .
2.	A cash flow statement helps in analysing the hospital's financial performance. Refer to section 10.8 Cash Flow Statement . The most effective way to control distress and ensure financial viability is to monitor costs and control expenses. Refer to sub-section 10.7.2 Resolving financial distress .
2. 1. 2. 3.	A cash flow statement helps in analysing the hospital's financial performance. Refer to section 10.8 Cash Flow Statement . The most effective way to control distress and ensure financial viability is to monitor costs and control expenses. Refer to sub-section 10.7.2 Resolving financial distress . Working capital can be effectively managed to generate productive results. Refer to sub-section 10.6.1 Managing capital for productive results .
2. 1. 2. 3. 4.	 A cash flow statement helps in analysing the hospital's financial performance. Refer to section 10.8 Cash Flow Statement. The most effective way to control distress and ensure financial viability is to monitor costs and control expenses. Refer to sub-section 10.7.2 Resolving financial distress. Working capital can be effectively managed to generate productive results. Refer to sub-section 10.6.1 Managing capital for productive results. A balance sheet displays chief assets and liabilities of a hospital. Refer to sub-section 10.5.1 Key factors of a balance sheet.
2. 1. 2. 3. 4. 5.	A cash flow statement helps in analysing the hospital's financial performance. Refer to section 10.8 Cash Flow Statement . The most effective way to control distress and ensure financial viability is to monitor costs and control expenses. Refer to sub-section 10.7.2 Resolving financial distress . Working capital can be effectively managed to generate productive results. Refer to sub-section 10.6.1 Managing capital for productive results . A balance sheet displays chief assets and liabilities of a hospital. Refer to sub- section 10.5.1 Key factors of a balance sheet . An income statement is a financial statement that clearly defines and indicates the organisation's financial status. Refer to section 10.4 Income Statement .

10.14 Case Study: Narayana Hrudayala Hospitals for Cardiac Care - An Example of Efficient Financial Operations and Quality Health Care at Affordable Cost

In 1990, a reputed heart surgeon in India was in the middle of a surgery when he received a call from a patient's residence requesting him to come over for a visit. He refused, but the caller insisted. Finally, the surgeon visited the patient, which ended up transforming his life. The patient was none other than Mother Teresa and the surgeon, Dr. Devi Shetty, who, inspired by the holy lady's humble yet strong words "hands that sew are holier than lips that pray" went ahead in life to set up one of the greatest services to mankind – a world quality healthcare service facility through the Narayana Hrudayalaya Hospitals for the underprivileged in India and in some countries in Africa.

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The Narayana Hrudayalaya chain that is based out of Southern India, traces its origins to 2001 when the first cardiac care unit opened its doors to patients on the fringes of Bangalore. It gradually spread its branches all over the country and presently boasts of hospitals in 14 cities in India. Every unit in the chain of hospitals is strongly grounded in its ideology and mission of providing superior quality specialist care for all at extremely low costs. In fact, an average open heart surgery performed in Narayana Hrudayala hospitals costs less than \$2000, which is almost one third of what it would cost elsewhere in India.

Dr. Shetty's fast evolving 'health city' today boasts of clinics and health centres specialising in eye, trauma, and oncology. Its team of doctors is technically equipped to provide telemedicine facilities and each has messaging apps like Skype installed on their laptops. As it provides video chat facilities, it helps doctors inspect patients and prescribe medications online. This has helped to extend its reach far and wide in 100 facilities in India and 50 in Africa.

Some of its superb infrastructure includes 5000 dialysis machines making it one of the leading centres for treating kidney failures and around 3000 beds to accommodate patients.

One of the principal reasons for the hospital chain's stupendous success as a healthcare facility par excellence is its amazing efficiency in managing its finances. It never compromises on quality be it in patient care or in non-patient activities and yet offers costs that enables its facilities to be availed by people from poor socioeconomic backgrounds. Some of the operational decisions it takes to remain comfortable financially include the following:

- It negotiates and buys equipment, devices and other essential items of its infrastructure directly from manufacturers. Therefore, it saves costs considerably as it manages to bypass distributors and other third-party vendors.
- Surgeons and doctors are left to focus primarily on patient care leaving peripheral activities like paperwork to well-trained staff to take care of. This enhances the productivity of doctors.
- Every Narayana Hrudayalaya hospital doctor receives fixed remuneration which is independent of the number of operations they perform. This helps the hospital to save on costs as they do not need to pay surgeons on per operation basis.
- Doctors at Narayana Hrudayalaya are given a regular profit and loss calculation sheet which helps them keep a track of profits earned or losses incurred. This helps predict and plan the future financial roadmap and take corrective actions if required.
- In 2002, Dr. Shetty launched a micro-insurance programme titled 'Yeshaswini.' Supported by the Karnataka government, the program has been launched to provide coverage to about 3 million farmers and their families for all surgeries and doctor visits. The premium to be paid for all the services is a meagre INR 18 per month. This ensures that the hospital eliminates the risk of non-payment from patients, avoids the potential financial distress, and ensures that it maintains its profitability.
- Though ideally built for the underprivileged, Narayana Hrudayalaya also has rich patients. The payments received from this category of patients acts as a safeguard for the hospital and compensates for lower payments received from others.

The Narayana Hrudayalaya financial operations management highlights several interesting lessons that could be adopted. These are as follows:

- A profit and loss document provided at a shorter frequency either daily, fortnightly or monthly helps to update the organisation on gaps that need to be plugged.
- Assigning appropriate roles to hospital personnel helps in enhancing productivity.
- Managing purchasing costs effectively help to maintain appropriate funds to be used for more productive

Discussion Questions

1. What is the best way to track financial performance and take corrective actions proactively, rather than as a reactive afterthought?

(**Hint:** The health of a hospital business is accurately assessed by analysing the revenue and expenses incurred through its performance reflected in its income statement.)

2. What are the creative measures adopted by Narayana Hrudayalaya to avoid financial distress?

(Hint: Adoption of insurance programs and building insight on profit and loss status of hospitals are some of the options designed by the hospital chain)

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CHAPTER



Purchasing and Material Management

Structure

- 11.1 Introduction
- Learning Objectives
- 11.2 Purchasing Strategy
- 11.3 Receiving the Material
- 11.4 Inventory Management
- 11.5 Inventory Control
- 11.6 Inventory Replenishment
- 11.7 Distribution Concepts
- 11.8 Product Standardisation
- 11.9 Vendor Evaluation
- 11.10 Protecting Inventory from Theft, Fraud and Kickback
- 11.11 Value Management, Value Engineering and Value Analysis
- 11.12 Summary
- 11.13 Glossary
- 11.14 Terminal Questions
- 11.15 Answers
- 11.16 Case Study: Impact of Efficient Supply Chain Management on Bottom Line Profitability, Kaiser Permanente (KP) Medical Care Organisation, Oakland, California, USA
- 11.17 References and Suggested Readings

Notes

Learning Objectives

After completing this chapter, you will be able to:

- Explain the purchasing strategy
- Discuss the receiving of material
- Define inventory management
- **D** Explain inventory control
- Describe inventory replenishment
- Define distribution concepts
- Discuss product standardisation
- **Explain vendor evaluation**
- **I** Identify how to protect inventory from theft, fraud and kickback
- **D** Explain value management, value engineering and value analysis

11.1 Introduction

Buying something is acquiring it at a set price, plain and simple. Having said that, the scope of what constitutes "buying" has expanded in the previous 70 years. Purchasing, in a larger sense, is a management activity that seeks to ensure that various departments of an organisation obtain the correct materials from the appropriate source at the right time in the right quantity. Healthcare providers today are under increasing pressure to make cost-effective purchasing selections from a network of reliable suppliers that can meet their demands for timely, high-quality items at prices they can all agree upon. Centralised purchasing allows one to save money when making purchases. Because of this, it is possible to centralise all of the procurement processes.

After acquiring goods, it is crucial for a hospital or organisation to keep and treat them properly to prevent damage or theft. In order to facilitate the production process more efficiently, materials management seeks to get the appropriate quality and amount of materials from the appropriate source at the appropriate time. Enhanced sales, better customer service and lower production costs are the end outcomes for any business. The management of materials includes a wide range of tasks, including planning and controlling resources, purchasing, managing stores, handling commodities and supply chain management.

In this chapter, you will learn about the various concepts related to purchasing and materials management.

11.2 Purchasing Strategy

Purchasing strategy is a complex process and requires minute attention to all activities attached to the purchase cycle. It helps in an effective use of sourcing and technology and thus, aids in reducing hospital costs.

Purchase requisition is the primary document on which all purchasing strategies are built. Its starts once the material or service request is given to the purchasing department by the user department, to procure a certain quantity of the same as on or by a certain date. Some of its components are as follows:

- Request For Quotation (RFQ)
- Quotation

- Purchase Order (PO)
- Contract
- Delivery scheduling agreement

11.2.1 Centralised Purchasing

Centralised purchasing is a system in which the purchase of materials is controlled by only one purchase department. This system ensures that any kind of mishandling and duplication is avoided; all the purchases are managed by a purchasing manager. A healthcare organisation has to strictly follow the centralised purchasing of materials for ensuring proper materials control as well as efficient store keeping.

Centralised purchasing enables the management to make purchases at the best prices and terms and to work with large suppliers. This central control provides an efficient system for controlling inventory, lowering staffing costs and decreasing overheads.

Some of the advantages of centralised purchasing are as follows:

- Technically automated system can be used to integrate purchasing systems with accounting and stock control.
- Updated purchase records can be kept in store.
- Materials can be purchased in bulk at a low price with favourable purchasing terms.
- Transportation costs can be reduced.
- The investment on inventory control can be minimised.
- A detailed record of suppliers is kept for easy access.
- Effective control of inventories can be kept at optimum levels.

Some of the negative effects of centralised purchasing are as follows:

- Ad hoc goods requisition needs to be sent from other areas to the purchasing department, causing delays.
- Investment on a higher scale has to be made in purchasing.
- Centralised purchasing becomes difficult when supplier branches are situated at different locations.
- There may be a lack of availability of materials with the local suppliers in case of an emergency.
- A geographically diverse hospital may not be able to take advantage of local discounts.
- A small hospital may not be able to hire the required staff and computerised system.

Centralised purchasing helps in tracking the local vendors with whom the best deals can be done for the respective department locations. It also assists in tracking the duplicity of orders, thus promoting benefits arising from high volume discounts, low standard transportation and inventory management costs, organised transactions and improved vendor relationships. The centralised purchasing department is usually located at the headquarters of the organisation.

11.2.2 Tactical and Operational Decisions in Purchasing

In purchasing, the focus of tactical decisions is on obtaining cost benefits and so, certain strategies are applied. For example, a purchasing strategy can be developed with known and preferred suppliers, cost-effective transportation can be developed by liaising with different

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logistics companies and warehousing strategies can be developed for cost reduction in inventory storage.

Decisions at the operational level are made each day in businesses. These decisions affect the products' movement along the operational way. Planning schedules, meeting with the medical suppliers and purchase agreements excise are all done by the operations department.

11.2.3 Functions of the Purchasing Department in an Organisation

In order to maintain the operational flow, a purchasing or procurement department has to be present in every public or private company. However, it is quite often seen that the employees are not aware of the activities of the purchasing department. Some of the activities of a purchasing department in a hospital are as follows:

Procuring Materials

The purchasing department plays an essential role in procuring all the relevant materials and supplies required for daily hospital operations. In order to provide the required medical supplies on time to the hospital staff, the purchasing department maintains an inventory to keep a track of the products available and the products that need to be purchased.

Evaluating Price

A purchasing department also evaluates the cost and price of materials and medical equipment in order to maximise profitability.

Self-Assessment Questions

- 1. _____ is a complex process and requires minute attention to all activities attached to the purchase cycle.
- **2.** Centralised purchasing is a system in which the purchase of materials is controlled by only one purchase department. (True/False)

11.3 Receiving the Material

The purchasing and material management department must be extremely aware of the products taken from suppliers. It is required to carefully check the materials that are incorrect or improperly packaged. However, in order for the material department to control all incoming materials, certain points need to be followed:

- Plan and design the receiving area in such a way that facilitates a smooth flow of operations of materials
- Train and guide employees on handling materials and equipment
- Inspect materials prior to acceptance because quality is very important in the service industry
- Check and confirm that materials are not damaged or in a leaking condition
- Recheck expiration dates
- Label materials properly

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- Purchase materials or supplies from quality suppliers
- Follow specific procedures for material handling and document storage properly

Self-Assessment Questions

- **3.** It is required to carefully check the materials that are incorrect or improperly packaged. (True/False)
- 4. In order for the material department to control all incoming materials, it is important to recheck ______ dates.

11.4 Inventory Management

Inventory management is an important concern for managers in all kinds of organisations. In a hospital, effective inventory management is important in order to have an easy access to the required supplies. Poor inventory management can be a serious threat to a healthcare organisation and consequently lead to big disasters. The challenge is not to cut inventories to the bone for reducing costs or to have in bulk but to have enough quantity as per the inventory planning.

Tasks managed by the inventory management department are as follows:

- Management of the material stocks by quantity and value
- Documentation of all goods movements
- Management of physical inventory

A successful operation involves chalking out a purchasing plan, which will ensure that products are always available whenever there is a need. However, correct levels of purchases have to be maintained to avoid the problem of having very less or excess products. The just-in-time method and materials requirement planning are the two major activities that the hospitals' inventory management teams follow.

11.4.1 Physical Location Planning

Physical location planning is an important part of inventory management. The physical infrastructure encompasses the physical setting of the inventory system and consists of the main goods flows and stock points of the products and items that are subjected to the analysis and (re) shaping process. In hospitals, these goods flows can relate to, for instance, medicines, drugs, medical devices, health aids (e.g. bandage) and surgical supplies. Therefore, in hospitals, many different flows of goods can be distinguished, and the overall physical infrastructure of the inventory system is often quite complex.

Among other issues, decisions on the physical shaping of the infrastructure include issues as whether or not "stockless schemes" should be applied, various stock points and the way the emergency sourcing of items is dealt with. The number of stock points relates closely to the product supply structure. At the same, many pharmaceuticals are directly delivered from a medical wholesaler or pharmaceutical industry to the hospital. The characteristics of the supply chain of pharmaceuticals, therefore, directly influence the number of stock points and the way medicines are distributed to and within the hospital.

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Physical planning must attain the following objectives:

- Right site selection
- Reasonable costs
- Proper layouts
- Updated locator systems

11.4.2 Facilities and Space Requirements

Facilities and space requirements in a hospital are a very crucial issue, as they need to be well designed and planned. However, few organisations and hospitals occupy more space than is required, which leads to lack of management. In order to reduce the space and improve utilisation, Lean 5S techniques can be used. Excessive space can lead to housing of expensive equipment, which could affect the hospital's budget. Hospitals are now taking measures to add equipment or tools as per requirements. Unwanted facilities units too occupy a large amount of space. Minimum key size rooms that are required to meet the needs of a patient and the hospital staff are considered while planning the hospital space layout.

Few areas or units that need attention during the layout plan are as follows:

- Hand washing facilities area
- ♦ Pharmacies rooms
- Patient holding areas
- Examination or treatment rooms
- Equipment storage room

11.4.3 Valuation and Accounting for Inventory

There are two widely accepted valuation methods for inventory accounting, which are discussed as follows:

- a. Perpetual inventory: It is a continuous inventory system where the details of the quantity and availability of inventory are regularly updated. Perpetual inventory is maintained by integrating the inventory system with order entries. Some of the inventory valuation methods used under a perpetual system are as follows:
 - i. First-in first-out (FIFO)
 - ii. Last-in first-out (LIFO)
 - iii. Average cost or weighted average cost
- **b. Periodic inventory:** It is an inventory system where periodic updates are made. When compared to the perpetual inventory systems, there is no need to keep up-to-date records of either the inventory or the cost of sold materials. Instead, the payments are checked only at the end of each year. The inventory depicted in the balance sheet must match with the physical count, which estimates the amount.

🔁 Self-Assessment Questions

- 5. Name one inventory management task.
- 6. List the three inventory valuation methods used under a perpetual system.

11.5 Inventory Control

Inventory control can be defined as a process of keeping a record or account of inventory, such as vaccines, bottles, synergies, stretchers, wheelchairs, etc., in a hospital or any organisation. The inventory control team keeps a report of the material or supplies present in the stockroom and that are required to be purchased. Inventory control ensures efficient and continuous material flow required for production and sales operations, along with maintaining the total inventory investment cost.

Effective coordination of a comprehensive inventory control system should be carried out with various planning and control functions, such as production scheduling and control and cash planning. The inventory department also takes care of production, financial and sales activities in an organisation. Inventory is viewed as a complete waste by the finance controller of the organisation. On the other hand, the marketing manager always requires a good stock of finished goods inventory in order to provide excellent customer service, which enhances the organisation's goodwill and maintains high sales. Production manager avoids situations where the stock is out of order, for which the production might be held up. It observed that everyone has some objectives that are conflicting in nature. Therefore, the basic problem is to maintain a balance between operations and the costs of investment. To avoid the basic conflicts at the minimum while optimising the inventory holding and other associated costs, the team needs to study the inventory status carefully.

The objectives of inventory control are as follows:

- 1. It aims to minimise the idle time, which occurs as a result of less materials. Neither people nor machines should have idle time due to material shortage.
- **2.** It aims to offer maximum service and satisfaction to customers with regard to fulfilling the due dates strictly as per orders.
- It also aims to minimise the capital investment and cost of storage.

An efficient inventory control system is important because of the following reasons:

- 1. It reduces production delays. The risks of plant closures, unemployment, less dividends, management change, etc. also get reduced significantly.
- 2. It enables a company to secure various economies. For instance, there is no ordering duplication, available materials are utilised properly by inter-department transfers, costs are reduced by bulk purchasing, freight is lowered, greater discounts are offered, price is lowered, clerical work is minimised, etc.
- **3.** It is necessary for an efficient accounting system, particularly for the material aspect of cost accounting.
- 4. It discourages dishonesty, for example, stealing material from the plant.
- 5. It expedites the preparation of financial statements.
- 6. It minimises losses, damages and deterioration of materials and enables careful material handling.

Notes

Notes

The functions of inventory control are as follows:

- 1. Ensuring that the stock of goods is consistently maintained at the most suitable level to meet the ongoing requirements of the sales department.
- **2.** Managing the capital investment in stocks at a minimal acceptable level, without compromising the primary interests of trading.
- **3.** Safeguarding stocks against losses and damages caused by improper handling, pilferage, or unauthorized removal from the store.
- **4.** Receiving and documenting all goods entering the store, while maintaining an accurate record of each outgoing item.
- **5.** Indexing all stock items for swift identification, achieved through the use of identifying marks, labels, and Bin Cards.
- 6. Maintaining up-to-date inventory records to disclose the quantity and value of all warehouse goods, details of warehouse deliveries, transaction receipts, stock replenishment, and information on the ordering of new stock.

The standards in inventory control are as follows:

- **1. The maximum level:** This denotes the upper boundary of stocks or inventory. It highlights the largest amount typically held in storage for economical reasons.
- 2. The minimum level: This signifies the lowest boundary of stocks or inventory, serving as a primary safety buffer or reserve. Such a safety threshold is only to be utilised in urgent situations. It represents the smallest stock quantity that should always be accessible and is the minimum a retailer ought to keep in reserve.
- 3. The standard order: This pertains to the volume of stock to be ordered at any given time. Consistent orders for a specific amount of medical items persist unless circumstances alter, prompting a review of this standard order. A purchase request is made for the volume that requires replenishment.
- 4. The ordering point: This indicates the stock volume essential to prevent potential shortages, particularly between the time an order is placed and its actual delivery. Should stock levels diminish, it's imperative to promptly place a new order. The duration needed to obtain the necessary items after placing an order should be meticulously assessed, ensuring a sufficient buffer is included for possible transport delays or obstructions.

🔁 Self-Assessment Questions 🗋

- **7.** ______ can be defined as a process of keeping a record or account of inventory, such as vaccines, bottles, synergies, stretchers, wheelchairs, etc., in a hospital or any organisation.
- 8. Which of the following standards in inventory control refers to the quantity of stocks to be requisitioned for purchase at a time?

a. The ordering point

- b. The maximum level
- c. The minimum level d. The standard order

11.6 Inventory Replenishment

Inventory replenishment is an operation that involves refilling the stock in order to avoid any last minute out of stock disaster. Replenishment is done as much as possible of the supplies or materials or safety measures.

Replenishment rules are applied by inventory management systems to enhance productivity and automate operations to a specific limit. Replenishment is often applied when the inventory level hits the reorder point or in case of an emergency requirement of medical tools. The Economic Order Quantity (EOQ) is produced when the inventory hits the reorder point.

The inventory replenishment process consists of the following steps:

- 1. Define replenishment options.
- 2. Modify replenishment requests.
- 3. Maintain fixed restocking requests.
- 4. Communicate with a third-party for a forecast planning application.

11.6.1 Perpetual Inventory System

Nowadays, there are several inventory control techniques utilised by hospitals. These various techniques are as follows:

- 1. Perpetual Inventory and Continuous Stock Taking
- 2. A. B. C Analysis
- 3. Input-Output Ratio Analysis
- 4. Inventory Turnover Ratio
- 5. Economic Order Quantity

Among these techniques, the perpetual inventory system is the most popular. According to **The Institute of Costs and Management Accountants, England**, perpetual inventory is defined as "the physical movements of stocks and their current balance. It is a method of ascertaining balance after every receipt and issue of materials through stock records to facilitate and issue of materials through stock records to facilitate regular checking and to avoid closing down for stock-taking. In order to ensure accuracy of perpetual inventory record, it is desirable to check the physical stocks by a programme of continuous stock-taking. Any discrepancy noted between physical stock and stock records can be investigated at the same time".

🔁 Self-Assessment Questions 🕻

- **9.** ______ is an operation that involves refilling the stock in order to avoid any last minute out of stock disaster.
- 10. Expand EOQ.

Notes

11.7 Distribution Concepts

When products are bought from a distributor, it can be noticed that the internal processing costs are significantly lower as compared to that of products bought directly from the producer. The main reason for this is the fact that distributors offer a streamlined purchasing process. Moreover, the ordering process cycle time is also less through this way because of the integration of data and technology.

The products sold via distributors are usually the ones that are already included in the healthcare organisation's MMIS system, alongside established product records related to vendor and contract pricing. This helps to streamline the requisitioning process and in turn, quickens product procurement.

Hospitals usually look at their distribution models and so, particular products purchasing is repeated without much research in the distribution channel. Relying too heavily on the distribution concept can prove to be misleading, and hospitals should not evaluate their distribution channel usage without analysing additional factors.

🖄 Self-Assessment Questions

- 11. When products are bought from a distributor, it can be noticed that the internal processing costs are significantly higher as compared to that of products bought directly from the producer. (True/False)
- 12. Relying too heavily on the _____ concept can prove to be misleading.

Activity

Visit a nearby hospital and take note of the distribution model and channel used by it.

11.8 Product Standardisation

The concept of standardisation has been applied to material and products. However, in the recent years, its application has been extended to system, procedures and environment. Product standardisation is the process of fixing specifications regarding certain characteristics such as size, shape, weight, colour, physical property, chemical property, performance, etc. of a material product.

Product standardisation can assist in:

- Introducing a product to staff and surgeons whilst facilitating its adoption through appropriate change management and communication.
- Minimising repetition in areas like training, knowledge transfer, product management, and restocking procedures.
- Enhancing the transferability of expertise and skills.
- Increasing safety for the hospital staff
- Determining the clinical case costing
- Saving the overall costs with the help of the economies of scale and purchasing and streamlining adoption processes.

Notes

🔁 Self-Assessment Questions

- 13. The concept of standardisation has been applied to material and products. (True/False)
- 14. ______ is the process of fixing specifications regarding certain characteristics such as size, shape, weight, colour, physical property, chemical property, performance, etc. of a material product.

11.9 Vendor Evaluation

The system of recording and ranking supplier performance, with regards to the number of issues affecting the delivery performance and standard of products is termed as vendor evaluation. An effective vendor evaluation process makes the purchasing process efficient. Selecting a vendor is pivotal due to its strategic significance, particularly in the context of government provisions where financial stakes and volumes are typically substantial. A vendor's track record is rooted in historical performance. The evaluation of an official vendor record determines their rating. Vendors receive rankings or designations based on their performance metrics, encompassing factors like delivery punctuality, quality, cost, and more.

In a hospital, ratings are used to:

- **a.** Judge and monitor supplier performance with the motive of rewarding suppliers who fulfil both the current and future supply relationship expectation.
- **b.** Provide accurate feedback to suppliers, detailing their strengths and weaknesses (as observed from the customer's viewpoint). This feedback will enable suppliers to work on their weak areas so that they can offer improved service in the future.
- **c.** Provide benchmark data that enables suppliers to understand their current placement when compared to the industry's best performers. This will enhance the overall market competitiveness.
- **d.** Help minimise subjectivity in judgment and make it possible to consider all relevant criteria in assisting suppliers. This includes collecting report from all the areas of performance and providing it in one package so that specific action can be taken to correct the identified performance disabilities. The performance of vendors can be enhanced by setting up continuous review standards.

11.9.1 Prime Vendor Contract

A prime vendor agreement serves as a pricing mechanism presented by distributors to operators for regularly procured items. Typically, distributors aim to secure a significant portion of an operator's procurement leverage, offering preferable pricing for essential medical goods in return. This mutual agreement aims to be advantageous for both entities. The pricing structure of a prime vendor hinges on:

- Cost-plus pricing: Often termed as fixed pricing, this method entails the product cost combined with a consistent mark-up for items with relatively stable market dynamics, such as surgical equipment and medical tools, throughout the contract's duration.
- **Cost-percentage pricing:** This approach merges the product cost with a percentage margin, primarily for high-demand items susceptible to swift market fluctuations.

Notes

- **Cost pricing**: It is when the distributor is willing to sell items at cost.
- **Market pricing**: It is applied on products that vary by a great degree throughout the year, such as seafood, dairy, meat, etc.

When negotiating with a prime vendor, the buyer needs to be aware of the terms and conditions that apply to the distributor in order to get the product to the hospital. Certain conditions such as the weather, fuel costs, road disasters, etc. are a few challenges that the distributors face in delivering products on time. Such conditions could also affect the costs of the material, delivery schedules or quantity of product that can be delivered.

On the other hand, distributors should always have a good understanding of the nature of the organisations they serve. Hospitals are always on a high alert when it comes to the standard, quality and availability of medical products. Therefore, it is compulsory for the distributors to always understand that service is paramount for retaining their customers' satisfaction. Negotiating a prime vendor agreement should be based upon the service aspects of the contract.

Effective elements of the service component are as follows:

- Terms of payment and/or credit lines
- Quality of communication with sales representative
- Quality and quantity of products being ordered.
- Detect and resolve error, if any with the orders.

Vendor/Supplier evaluation involves assessing and approving potential suppliers through quantitative analysis. The objective of this assessment is to guarantee a selection of top-tier suppliers for use. Additionally, ongoing evaluation of existing suppliers is conducted to gauge and oversee their performance in terms of cost reduction, risk mitigation, and a proactive approach to improvement.

Vendor/Supplier evaluation is an ongoing procedure within procurement departments and constitutes a segment of the preliminary qualification phase in the procurement process. Nevertheless, in numerous organisations like hospitals, it's essential to take into account the involvement and insights of other departments and units. Organisations experienced in gathering supplier evaluation information apply five-step processes to determine which one to approve. These processes include the use of questionnaires or site visits to assess different aspects of a supplier's business, such as quality assurance, organisational performance, financial capacity, etc. Depending on the evaluation report, a supplier may or may not be approved as the organisation's main product or service provider. In many organisations, such as hospitals, there is an Approved Supplier List (ASL) to which a qualified supplier is added. If the supplier is rejected, the procurement team will not consider the supplier in future. But if approved, the supplier needs to be re-evaluated annually. The ongoing process is defined as supplier performance management.

Self-Assessment Questions

- 15. Vendor/Supplier evaluation refers to the process of evaluating and approving potential suppliers by quantitative estimation. (True/False)
- **16.** The aim of ______ is to ensure that a portfolio of the best in class suppliers is available for use.

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Activity

Visit any commercial department of a hospital and write down your observations on vendors/suppliers.

11.10 Protecting Inventory from Theft, Fraud and Kickback

Theft annually results in substantial material and product losses for numerous organisations and healthcare facilities. Determining if the "shrink" in inventory is the result of theft or waste can be a challenging task. If anything breaks while being assembled or handled, or if there is any waste (such as off cuts, residuals, etc.), the hospital personnel should notify the person in charge. It is the responsibility of the supervisor to record any items that are considered wasteful, such as medical products or broken ones, and to deduct them from the inventory on a daily or weekly basis. If the supervisor notices trends with specific employees or procedures, this information might be useful for improving those areas or providing remedial training. Here are the several methods of protection:

- 1. If you own a medical store, inventory control will need efforts such as preventing shoplifting. In order to avoid such kind of theft, installing security cameras could be of help. Educating the staff or employees about loss prevention and in-store inventory control can also prevent any disorder.
- **2.** You can consider using various tracking devices such as time clocks and cameras to continuously track which employees are involved with inventory handling.
- **3.** The staff and all other employees in a hospital must be kept aware of the preventive and safety measures that are being implemented. This further prevents any internal theft or fraud.
- 4. You should restrict access to the inventory software management system's data to only authorised, trustworthy individuals. Users can get inventory updates because most software systems demand a unique login. Staff members and employees of the hospital should be reminded not to divulge their login credentials to anyone. So, in the event that an issue arises, you can trace back the modifications made to the inventory numbers.
- 5. Also, make sure you encrypt all company-related software, including inventory tracking software, using a strong password. Afterwards, the password can only be shared with the selected hospital personnel that have direct contact with your inventory or supply chain management. Once again, make sure that every person with access has their own unique username and password.
- 6. Make sure to keep inventory secured. Employees frequently disregard the location designated for inventory storage. The best course of action is to establish a system of checks and balances with your staff to make sure that the doors are always closed and the alarms are always turned on. The most costly inventory goods should only be accessible to designated staff, such as managers or line supervisors. By doing so, they take responsibility for those things. Consider installing a "cage" in your warehouse to store valuable items or installing secured cabinets similar to those used in jewellery stores to secure your retail space (and only the managers have the keys). You can end up saving a tonne of money by doing a few simple actions.

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If the right and safe inventory management procedures are followed, there's no chance of any theft. Just protect the hospital with a highly organised inventory management system.

🔁 Self-Assessment Questions

- **17.** The duty of a supervisor is to keep a track of wasteful materials or medical products and breakage on a daily basis and deduct it from ______ either daily or weekly.
- Employees and hospital staff should be advised to share their user ID or passwords. (True/False)

11.11 Value Management, Value Engineering and Value Analysis

A professionally-functioning and methodical team approach to value analysis, engineering, and management is utilised to analyse and enhance a product's value in order to resolve issues, decrease expenses and increase performance or quality standards. Improving customer happiness and increasing investment value are both aided by enhancements to value engineering.

A product, system or service's value can be enhanced through the study of value engineering. In the early 1960s, the US military industry began providing this type of service. Organisations such as hospitals have since made extensive use of value engineering. By implementing this technique, one can enhance product quality while simultaneously decreasing costs. The ratio of a function's cost to its value is the formula for value. Raising the price or enhancing the product's functionality are two ways to improve it. Value engineering's guiding principle, however, states that even while making enhancements to a product, its essential functions must remain unchanged.

The reasoning behind value engineering is that manufacturers can design a product only for a certain time period if they perceive that their products will stop functioning soon. Thus, it is better to have clarity and understanding and so, value engineering provides a structured problem-solving process, which helps to analyse the functioning of a product.

🔁 Self-Assessment Questions

- 19. _____ is the study of the process of producing or offering a product, system or service to add value to it.
- 20. Value is defined as the ratio of function to cost. (True/False)

11.12 Summary

- Purchasing strategy is a complex process and requires minute attention to all activities attached to the purchase cycle.
- Centralised purchasing is a system in which the purchase of materials is controlled by only one purchase department.
- Tasks managed by the inventory management department include management of the material stocks by quantity and value, documentation of all goods movements and management of physical inventory.

Notes

- Inventory control can be defined as a process of keeping a record or account of inventory, such as vaccines, bottles, synergies, stretchers, wheelchairs, etc., in a hospital or any organisation.
- Inventory replenishment is an operation that involves refilling the stock in order to avoid any last minute out of stock disaster.
- The system of recording and ranking supplier performance, with regards to the number of issues affecting the delivery performance and standard of products is termed as vendor evaluation.
- Value management, analysis and engineering is a professionally functioned and systematic team approach used to analyse and improve value in a product for solving problems and/or reducing costs while improving performance or quality requirements.

11.13 Glossary

- **Centralised purchasing:** It is a system in which the purchase of materials is controlled by only one purchase department.
- Periodic inventory: It is a system of inventory in which updates are made on a periodical basis.
- **Perpetual inventory:** It is a system of inventory in which the details of the quantity and availability of inventory are regularly updated.
- **Purchase requisition:** It is the primary document on which all purchasing strategies are built.

11.14 Terminal Questions

- 1. Why is the performance evaluation of vendor required?
- 2. What are the different valuation methods used for inventory accounting? Explain.
- 3. Explain inventory replenishment.
- 4. How can product standardisation assist in a hospital's growth?
- 5. What are the various ways to protect inventory from theft?

11.15 Answers

Q.	Self-Assessment Questions
1.	Purchasing strategy
2.	True
3.	True
4.	Expiration
5.	Management of physical inventory
6.	First-in first-out (FIFO), Last-in first-out (LIFO) and average cost or weighted average cost
7.	Inventory control

NOTES

8.	d. The standard order
9.	Inventory replenishment
10.	Economic Order Quantity
11.	False
12.	Distribution
13.	True
14.	Product standardisation
15.	True
16.	Supplier evaluation
17.	Inventory
18.	False
19.	Value engineering
20.	True
Q.	Terminal Questions
1.	An effective vendor evaluation process makes the purchasing process efficient.
	Refer to section 11.9 Vendor Evaluation.
2.	There are two widely accepted valuation methods for inventory accounting,
	namely, perpetual inventory and periodic inventory. Refer to sub-section 11.4.3 Valuation and Accounting for Inventory.
2	Inventory replenishment is an operation that involves refilling the stock
5.	in order to avoid any last minute out of stock disaster. Refer to section
	11.6 Inventory Replenishment.
4.	Product standardisation can assist in various ways such as introducing a
	product to staff and surgeons and easing adoption through appropriate
	Standardisation.
5.	Inventory can be protected from theft by using cameras and inventory tracking
	software. Refer to section 11.10 Protecting Inventory from Theft, Fraud
	and Kickback.

11.16 Case Study: Impact of Efficient Supply Chain Management on Bottom Line Profitability, Kaiser Permanente (KP) Medical Care Organisation, Oakland, California, USA

Healthcare expenditure in the United States amounted to \$6280 per person in 2004, or 16% of GDP, according to a poll. Healthcare product prices are expensive for a variety of reasons, including ineffective supply chain management, high administrative costs, improper care and storage-related waste. Manufacturers, buyers and healthcare providers are the three main links in the healthcare supply chain. There is hardly no coordinated supply chain management

Notes

because these three parties operate autonomously. Healthcare facilities' supply networks are affected by multiple factors. Some of these causes include out-of-date information technology systems and infrastructure, inefficient management of inventories and distribution, methods for ad hoc buying, and a lack of involvement from executives.

With 8.7 million health plan members, 150,000 employees, 13,729 physicians, 32 medical centres, 416 medical offices, and \$28 billion in annual operating revenue, Kaiser Permanente is one of the largest medical care organisations in the US. The volume of supply chain handling at this setup is easy to understand. Using the purchasing approach, KP ensures that all hospitals employ the most cost-effective items. One method they employ, which they refer to as "Sourcing and Standards teams," helps them attain their high degree of compliance (almost 90%).

Using third-party supply data service providers as an outsourced data manager is a relatively new trend in healthcare. KP investigates novel technology and builds on the achievements of other healthcare facilities. It is critical for hospitals to have enough inventory on hand to meet patients' requirements continuously, and KP's purchasing executives are more than competent of handling this task.

Since KP only keeps tabs on high-level information, its administrative cost is a meagre 6%. They must immediately begin reengineering their supply chain management.

Discussion Questions

1. What are the major points that KP has considered in order to efficiently manage the purchase and material management process?

(Hint: Exploring new technologies, keeping sufficient inventory at all times, etc.)

2. What is the overall administrative cost at KP?

(Hint: The overall administrative cost is very low.)

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