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**DEPARTMENT OF BIO MEDICAL
ENGINEERING**

**CBM351: HOSPITAL PLANNING AND
MANAGEMENT
NOTES**

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UNIT IV SUPPORTIVE SERVICES

HOSPITAL INFORMATION SYSTEMS & SUPPORTIVE SERVICES

Management Decisions and Related Information Requirement – Clinical Information Systems -Administrative Information Systems – Support Service Technical Information Systems – Medical Transcription, Medical Records Department – Central Sterilization and Supply Department -Pharmacy- Food Services – Laundry Services.

4.1 Management Decisions and Related Information Requirement

In management, decision-making is a critical process that involves choosing between alternative courses of action to achieve organizational goals. The effectiveness of these decisions often hinges on the availability and quality of information. Here's an overview of management decisions and the related information requirements:

1. Types of Management Decisions

- **Strategic Decisions:** Long-term decisions that set the overall direction of the organization (e.g., entering a new market, launching a new product).
- **Tactical Decisions:** Short- to medium-term decisions that focus on the implementation of strategies (e.g., resource allocation, marketing campaigns).
- **Operational Decisions:** Day-to-day decisions that ensure the smooth running of operations (e.g., scheduling, inventory management).

2. Information Requirements for Different Decisions

- **Strategic Decisions:**
 - **External Environment Data:** Market trends, competitor analysis, regulatory changes.
 - **Internal Capabilities:** Resource availability, financial performance, organizational strengths and weaknesses.
 - **Forecasts and Projections:** Economic forecasts, future demand projections, and potential risks.
- **Tactical Decisions:**
 - **Operational Data:** Sales figures, production rates, and supply chain metrics.
 - **Cost-Benefit Analysis:** Information on costs, potential returns, and risks.
 - **Resource Availability:** Information on human resources, finances, and technology.
- **Operational Decisions:**
 - **Real-Time Data:** Inventory levels, employee schedules, and machine performance.
 - **Standard Operating Procedures (SOPs):** Guidelines and rules for routine operations.
 - **Customer Feedback:** Data on customer satisfaction, complaints, and service levels.

3. Sources of Information

- **Internal Sources:**
 - Financial reports
 - Employee performance data
 - Internal databases (e.g., ERP systems)
- **External Sources:**
 - Market research reports
 - Competitor analysis
 - Industry publications
 - Government statistics

4. Challenges in Information Management

- **Data Overload:** Managers may struggle to sift through vast amounts of data to find relevant information.
- **Data Quality:** Ensuring the accuracy, timeliness, and relevance of information.
- **Information Silos:** Fragmented information across departments can lead to poor decision-making.

5. Role of Technology in Decision-Making

- **Decision Support Systems (DSS):** Tools that assist in data analysis and help managers make informed decisions.
- **Enterprise Resource Planning (ERP) Systems:** Integrate data across the organization, providing a comprehensive view of operations.
- **Business Intelligence (BI) Tools:** Provide analytical insights through data mining, reporting, and dashboards.

6. Ethical Considerations

- **Transparency:** Decisions should be based on accurate and unbiased information.
- **Confidentiality:** Sensitive information must be protected to avoid breaches of privacy or trust.
- **Accountability:** Decision-makers must be accountable for the information they use and the outcomes of their decisions.

Understanding the information requirements associated with each type of decision ensures that managers have the necessary data to make informed and effective decisions.

4.2 Clinical Information Systems (CIS)

Clinical Information Systems (CIS) are crucial in modern healthcare, providing healthcare professionals with the tools they need to manage patient information, streamline operations, and improve the quality of care.

Below is an overview of CIS, their components, benefits, and challenges.

1. Definition and Purpose

- **Clinical Information Systems (CIS):** Integrated systems that manage patient data and support clinical processes in healthcare settings. CIS are designed to enhance the efficiency, accuracy, and coordination of patient care.

2. Key Components of Clinical Information Systems

- **Electronic Health Records (EHR):** Digital versions of patients' paper charts, providing comprehensive and up-to-date patient information accessible by authorized healthcare providers.
- **Computerized Physician Order Entry (CPOE):** Systems that allow healthcare providers to enter medication orders, lab tests, and other treatment instructions electronically, reducing errors and improving efficiency.
- **Clinical Decision Support Systems (CDSS):** Tools that provide clinicians with patient-specific assessments or recommendations to aid in decision-making, based on clinical guidelines and patient data.
- **Laboratory Information Systems (LIS):** Systems that manage laboratory workflows, test orders, results, and reporting.
- **Radiology Information Systems (RIS):** Software used to manage medical imaging and associated data, including scheduling, reporting, and storing imaging results.
- **Pharmacy Information Systems (PIS):** Manage medication-related data and processes, including prescription management, inventory control, and drug interaction alerts.
- **Patient Monitoring Systems:** Systems that continuously monitor patient vital signs and other critical health metrics, often used in intensive care units (ICUs) and during surgeries.

3. Benefits of Clinical Information Systems

- **Improved Patient Care:** CIS improve access to accurate and up-to-date patient information, leading to better diagnosis, treatment planning, and patient outcomes.
- **Enhanced Efficiency:** Automation of routine tasks, such as order entry and result reporting, reduces the time spent on administrative tasks and allows healthcare providers to focus more on patient care.
- **Reduced Errors:** Electronic systems reduce the likelihood of human errors, such as medication errors or misinterpretation of handwritten notes, which can lead to adverse patient outcomes.
- **Data Integration:** CIS integrate data from different departments (e.g., laboratory, radiology, pharmacy), providing a comprehensive view of the patient's health status and improving coordination of care.
- **Cost Savings:** By improving efficiency and reducing errors, CIS can lead to cost savings for healthcare organizations.

4. Challenges in Implementing Clinical Information Systems

- **Initial Costs:** The implementation of CIS can be expensive, involving costs related to hardware, software, training, and system maintenance.
- **User Resistance:** Healthcare providers may resist adopting new systems due to the learning curve or disruption to established workflows.
- **Data Security and Privacy:** Protecting patient data from unauthorized access and breaches is a critical challenge, requiring robust security measures and compliance with regulations like HIPAA.
- **Interoperability Issues:** CIS must be able to communicate with other systems within and outside the healthcare organization, which can be challenging due to varying data formats and standards.
- **Maintenance and Upgrades:** Ongoing system maintenance and regular updates are necessary to keep the CIS functioning optimally, which can be resource-intensive.

5. Future Trends in Clinical Information Systems

- **Artificial Intelligence (AI) and Machine Learning:** Integration of AI and machine learning in CIS is expected to enhance predictive analytics, personalized medicine, and automated decision support.
- **Telemedicine Integration:** As telemedicine becomes more prevalent, CIS will increasingly integrate with telehealth platforms to support remote patient monitoring and virtual care.
- **Patient-Centered Care:** CIS will evolve to support more patient-centered approaches, such as patient portals that allow individuals to access their own health data, schedule appointments, and communicate with providers.
- **Interoperability Enhancements:** Efforts to improve interoperability across different CIS and with external systems (e.g., public health databases, other healthcare providers) will continue to advance.

Clinical Information Systems are fundamental to modern healthcare, providing the infrastructure needed to deliver high-quality, efficient, and patient-centered care. While there are challenges in their implementation and use, the benefits they offer in terms of improving patient outcomes and streamlining healthcare processes are significant.

Administrative Information Systems (AIS) are essential tools used in healthcare and other industries to manage the non-clinical, administrative functions of an organization. These systems support the day-to-day operations, help streamline processes, and enhance the overall efficiency of the organization. Below is an overview of AIS, their components, benefits, and challenges.

1. Definition and Purpose

- **Administrative Information Systems (AIS):** Integrated software applications designed to manage the administrative and operational aspects of an organization. In healthcare, AIS typically focus on tasks like patient registration, billing, scheduling, and human resources management.

2. Key Components of Administrative Information Systems

- **Patient Management Systems:** Handle patient registration, admission, discharge, and transfer processes. These systems help manage patient demographics, appointment scheduling, and patient flow within the facility.
- **Billing and Revenue Cycle Management:** Systems that manage the financial aspects of healthcare delivery, including billing, claims processing, payment posting, and accounts receivable management. These systems ensure that healthcare providers are paid for the services they deliver.
- **Scheduling Systems:** Manage the scheduling of appointments, surgeries, and other clinical procedures. These systems help optimize resource allocation, reduce patient wait times, and improve the efficiency of clinical workflows.
- **Human Resources Management (HRM) Systems:** Manage employee records, payroll, benefits, recruitment, and performance evaluations. HRM systems help streamline the management of the workforce, ensuring compliance with labor laws and regulations.
- **Supply Chain and Inventory Management Systems:** Track and manage the procurement, storage, and distribution of medical supplies, pharmaceuticals, and equipment. These systems help ensure that necessary resources are available when needed, while also controlling costs.
- **Financial Management Systems:** Handle accounting, budgeting, financial reporting, and auditing functions. These systems provide financial oversight and help organizations manage their finances efficiently.
- **Compliance and Risk Management Systems:** Ensure that the organization complies with regulatory requirements and manages risks associated with healthcare delivery. These systems track and report compliance-related activities and help mitigate potential risks.

3. Benefits of Administrative Information Systems

- **Operational Efficiency:** AIS streamline administrative tasks, reduce manual processes, and automate routine functions, leading to increased productivity and efficiency.
- **Improved Financial Performance:** By optimizing billing processes, managing revenue cycles, and controlling costs, AIS help organizations improve their financial health and profitability.
- **Better Resource Management:** AIS enable more effective management of resources, including personnel, equipment, and supplies, leading to reduced waste and better allocation of resources.
- **Enhanced Data Accuracy:** Automation of administrative processes reduces errors and improves the accuracy of data, which is critical for decision-making and reporting.
- **Regulatory Compliance:** AIS help organizations maintain compliance with regulatory requirements, reducing the risk of fines, penalties, and legal issues.
- **Improved Patient Satisfaction:** Efficient management of administrative tasks, such as scheduling and billing, can lead to shorter wait times, fewer billing errors, and an overall better patient experience.

4. Challenges in Implementing Administrative Information Systems

- **High Initial Costs:** Implementing AIS can be expensive, requiring significant investment in software, hardware, and training.

- **Integration with Clinical Systems:** Ensuring that AIS integrate seamlessly with clinical information systems can be challenging, but is essential for comprehensive patient care and streamlined operations.
- **User Adoption:** Employees may resist adopting new systems due to the learning curve or perceived disruption to their work routines.
- **Data Security and Privacy:** Protecting sensitive administrative and financial data from unauthorized access and breaches is a major concern, requiring robust security measures.
- **System Maintenance and Updates:** Regular maintenance and updates are necessary to keep AIS functioning properly and to incorporate new features or regulatory changes.

5. Future Trends in Administrative Information Systems

- **Cloud-Based Solutions:** The adoption of cloud-based AIS is increasing, offering scalability, flexibility, and cost savings compared to traditional on-premise systems.
- **Artificial Intelligence (AI) and Automation:** AI-driven analytics and automation are becoming more prevalent in AIS, helping organizations to further optimize operations, predict trends, and make data-driven decisions.
- **Interoperability Enhancements:** Efforts to improve interoperability between administrative and clinical systems will continue, allowing for more seamless data exchange and comprehensive patient management.
- **Patient-Centered Administration:** AIS are increasingly focusing on enhancing the patient experience, offering features like online appointment scheduling, bill payment, and patient portals for easy access to information.
- **Data Analytics and Business Intelligence:** Advanced analytics tools are being integrated into AIS to provide deeper insights into operational performance, financial health, and patient satisfaction.

Administrative Information Systems are vital for the smooth operation of healthcare organizations and other industries. By automating and optimizing administrative tasks, AIS allow organizations to focus more on their core mission, whether that's delivering high-quality patient care or achieving business objectives.

Support Service Technical Information Systems (SSTIS) are specialized systems designed to manage and support the technical and operational aspects of an organization's support services. These systems are crucial in ensuring that the infrastructure, equipment, and support services function efficiently, allowing the organization to maintain a high level of service quality. Below is an overview of SSTIS, their components, benefits, and challenges.

1. Definition and Purpose

- **Support Service Technical Information Systems (SSTIS):** These are integrated software systems that manage the technical support functions within an organization. SSTIS handle tasks such as facility management, equipment maintenance, IT support, and other technical services that are vital for the smooth operation of an organization, particularly in environments like hospitals, universities, or large corporations.

2. Key Components of Support Service Technical Information Systems

- **Facility Management Systems:** These systems manage the maintenance and operation of physical facilities, including building infrastructure, HVAC (Heating, Ventilation, and Air Conditioning), plumbing, electrical systems, and security.
- **Equipment Maintenance Systems:** Track and manage the maintenance schedules, repair history, and lifecycle of critical equipment, ensuring that all machinery and devices are functioning properly and are regularly serviced.

- **IT Support and Helpdesk Systems:** Manage IT service requests, troubleshooting, and technical support for hardware and software issues. These systems often include ticketing systems, knowledge bases, and remote support tools.
- **Asset Management Systems:** Track and manage the organization's assets, including hardware, software, vehicles, and other equipment. These systems help in inventory management, depreciation tracking, and asset allocation.
- **Environmental Monitoring Systems:** Monitor environmental conditions within facilities, such as temperature, humidity, and air quality, which is especially critical in healthcare, manufacturing, and research environments.
- **Security and Surveillance Systems:** Manage security protocols, including access control, video surveillance, and alarm systems, to ensure the safety and security of the organization's assets and personnel.
- **Energy Management Systems:** Monitor and manage energy consumption within the organization, helping to optimize energy use and reduce costs through smart grids, energy-efficient practices, and sustainability initiatives.

3. Benefits of Support Service Technical Information Systems

- **Operational Efficiency:** SSTIS streamline and automate the management of technical support services, reducing downtime and ensuring that all systems and equipment operate smoothly.
- **Preventive Maintenance:** With automated scheduling and alerts, SSTIS help organizations perform preventive maintenance on equipment and facilities, reducing the risk of unexpected failures and extending the lifespan of assets.
- **Cost Savings:** By optimizing the use of resources, energy, and maintenance processes, SSTIS help organizations save on operational costs and reduce waste.
- **Improved Safety and Compliance:** SSTIS ensure that safety protocols are followed and that the organization complies with regulatory standards, reducing the risk of accidents and legal issues.
- **Enhanced Decision-Making:** Through data collection and analytics, SSTIS provide insights into operational performance, helping managers make informed decisions about resource allocation, maintenance schedules, and capital investments.

4. Challenges in Implementing Support Service Technical Information Systems

- **High Implementation Costs:** The initial setup of SSTIS can be costly, involving investment in software, hardware, training, and ongoing maintenance.
- **Integration with Existing Systems:** Integrating SSTIS with other information systems within the organization can be complex, especially if the existing systems are outdated or incompatible.
- **User Training and Adoption:** Ensuring that staff are properly trained and willing to adopt the new systems can be a significant challenge, particularly in organizations with a large workforce.
- **Data Security and Privacy:** Protecting sensitive data related to facilities, equipment, and personnel is critical, requiring robust cybersecurity measures to prevent unauthorized access and breaches.
- **Scalability and Flexibility:** As organizations grow or change, SSTIS must be scalable and flexible enough to adapt to new requirements, which can be challenging if the system was not designed with future expansion in mind.

5. Future Trends in Support Service Technical Information Systems

- **Internet of Things (IoT) Integration:** SSTIS are increasingly integrating IoT devices to enable real-time monitoring and control of equipment, facilities, and environmental conditions, leading to more responsive and efficient operations.
- **Artificial Intelligence (AI) and Machine Learning:** AI and machine learning are being used to predict equipment failures, optimize maintenance schedules, and enhance energy management, providing more intelligent and automated solutions.
- **Cloud-Based Solutions:** Cloud-based SSTIS offer greater flexibility, scalability, and remote access, allowing organizations to manage their support services from anywhere with internet connectivity.
- **Sustainability and Green Technology:** As organizations focus more on sustainability, SSTIS are incorporating features that help reduce energy consumption, monitor environmental impact, and promote eco-friendly practices.
- **Enhanced Cybersecurity:** With the increasing reliance on digital systems, SSTIS will continue to evolve to provide stronger cybersecurity measures, protecting critical infrastructure and data from cyber threats.

Support Service Technical Information Systems are essential for maintaining the operational integrity of an organization's infrastructure and equipment. By leveraging these systems, organizations can enhance their efficiency, reduce costs, and ensure that their technical support services are robust and reliable.

Medical transcription

Medical transcription is a critical process in the healthcare industry where voice-recorded medical reports dictated by healthcare professionals are converted into written text. This text is then added to the patient's medical records. The role of medical transcriptionists (MTs) and the evolution of the field, including the integration of technology, are essential components of modern healthcare documentation. Below is an overview of medical transcription, its process, benefits, challenges, and future trends.

1. Definition and Purpose

- **Medical Transcription:** The process of transcribing voice-recorded medical dictations into text format. These dictations can include patient histories, physical examination reports, operative reports, discharge summaries, and other medical documents.
- **Purpose:** To create accurate, clear, and comprehensive written records of patient interactions, treatments, and medical procedures, which are crucial for ongoing patient care, legal documentation, and insurance purposes.

2. Process of Medical Transcription

- **Dictation by Healthcare Providers:** Physicians, surgeons, nurses, and other healthcare professionals record their observations, diagnoses, treatments, and instructions as audio files.
- **Transcription:** Medical transcriptionists listen to these audio recordings and transcribe them into written documents. This requires a deep understanding of medical terminology, anatomy, and the specific formatting requirements for medical documentation.
- **Editing and Proofreading:** The transcribed text is reviewed for accuracy, grammar, and consistency. In some cases, transcriptionists may also correct errors in dictation or clarify unclear information by consulting with the healthcare provider.
- **Formatting and Submission:** The final document is formatted according to the facility's standards and submitted to the appropriate medical records system or electronic health record (EHR).

3. Key Skills Required for Medical Transcription

- **Medical Knowledge:** A thorough understanding of medical terminology, anatomy, pharmacology, and diagnostic procedures is essential.
- **Attention to Detail:** Transcriptionists must accurately capture every detail of the audio recordings, including complex medical terms and acronyms.
- **Typing Speed and Accuracy:** Efficient typing skills are crucial for transcribing lengthy dictations quickly and accurately.
- **Listening Skills:** The ability to understand and transcribe audio recordings, even those that may be unclear or spoken with an accent.
- **Confidentiality and Ethics:** Transcriptionists handle sensitive patient information and must adhere to strict confidentiality standards and HIPAA (Health Insurance Portability and Accountability Act) regulations.

4. Benefits of Medical Transcription

- **Accurate Patient Records:** Transcription ensures that detailed and accurate records are maintained, which is essential for patient care continuity and legal documentation.
- **Time Efficiency for Physicians:** Allows healthcare providers to focus on patient care rather than documentation, as transcriptionists handle the detailed recording of patient interactions.
- **Support for Legal and Insurance Purposes:** Transcribed documents serve as legal records and are used for insurance claims, billing, and audits.
- **Standardization of Records:** Transcription helps in maintaining consistent and standardized documentation across the healthcare facility, improving overall record-keeping.

5. Challenges in Medical Transcription

- **Accuracy and Error Rates:** Errors in transcription, such as misinterpreting medical terms or missing information, can have serious consequences for patient care.
- **Technological Challenges:** While technology aids in transcription, poor-quality recordings, background noise, and unfamiliar accents can pose challenges.
- **Confidentiality Risks:** Ensuring the security of transcribed documents and protecting patient privacy are critical, especially when outsourcing transcription services.
- **Evolving Technology:** The rise of speech recognition software and AI has reduced the demand for traditional transcriptionists, requiring them to adapt to new roles such as editing and proofreading AI-generated text.

6. Future Trends in Medical Transcription

- **Speech Recognition Software:** Advanced speech recognition technology is increasingly used to automatically transcribe dictations. However, human transcriptionists often review and edit these transcriptions to ensure accuracy.
- **Artificial Intelligence (AI):** AI-powered tools are being developed to improve the accuracy of transcription and to assist with tasks like categorizing and summarizing medical information.
- **Integration with Electronic Health Records (EHR):** Transcription services are being integrated directly with EHR systems, allowing for seamless documentation and easier access to patient records.
- **Outsourcing and Remote Work:** Many healthcare providers outsource transcription to specialized firms, often in different geographic locations, or hire remote transcriptionists, which can lower costs but also requires stringent security measures.

- **Evolution of the Transcriptionist Role:** As technology evolves, the role of medical transcriptionists is shifting towards more editing and quality assurance, requiring them to adapt their skills to work alongside AI and speech recognition technologies.

Medical transcription remains a vital component of healthcare documentation, ensuring that patient records are accurate, accessible, and legally compliant. Despite technological advances, the need for skilled transcriptionists continues, particularly in ensuring the accuracy and quality of healthcare documentation

Top of Form
Bottom of Form

1. MEDICAL RECORDS DEPARTMENT

1.1 Overview

The medical records department maintain records and documents relating to patient care.

Among a host of activities, its main functions are filing, indexing and retrieving medical records.

The primary purpose of establishing a medical records department is to render services to patients, medical staff and hospital administration.

The quality of care rendered depends on the accuracy of information contained in medical records, its timely availability to and the extent of utilization by the professional staff.

To achieve economy, accuracy of information and good communication which are of vital importance to the medical records system, all information should be concentrated in the original medical records of patients.

This should be indexed and filed in the department. The three basic principles of medical records are:

- Accurately written,
- Properly filed, and
- Easily accessible.

Medical records are used as primary tools to evaluate the quality of patient care rendered by the medical staff.

To implement this effectively, the medical staff must adopt and self-enforce rules and regulation for the production of timely, accurate and complete medical records.

Medical records are widely used for teaching and research purposes.

In the context of increasing malpractice liability suits against hospitals and physicians, well-documented medical records are a good legal protection.

The physician is primarily responsible for the quality of his patient's medical records.

It is his duty to review correct and countersign records that are written by residents and junior doctors working under him.

Each entry in the medical record must be signed by the person making the entry, and the signature should be identifiable so that responsibility for accuracy and authenticity can be fixed.

The language used in writing medical records should be clear and concise and should not lend itself to misinterpretation.

Abbreviation, symbols, etc. should be of acceptable standard.

The medical records department should maintain a list of acceptable abbreviations and symbols for everyone to follow.

Every hospital should formulate policies, rules and regulations for the production, completion and maintenance of medical records.

In many hospitals, registration is an integral part of medical records.

The front office, which registers all patients, assigns each new patient a unique number, collects patient demographics and other necessary data, assigns/directs patients to physicians, and creates records.

In the case of returning patients it retrieves their records and updates them. It maintain a master patient index for all patients.

Registration is the starting point for outpatient visits and all patient-related activities.

1.2 Functions

i) Planning, developing and directing a medical record system that includes patient's original clinical records and also the primary and secondary records and indexes. These may be in the central record room, the clinical service area, adjunct departments or the outpatient department of the hospital.

ii) Maintaining proper facilities and services for accurate and timely production, processing, checking, indexing, filing and retrieval of medical records.

iii) Developing a procedure for the proper flow of records and reports among the various services and departments including clinical services and the outpatient clinics where they are needed.

iv) Developing a statistical reporting system that includes ward census, consolidated daily census, outpatient department activities, and statistics in relation to services such as radiology, clinical laboratories and pharmacy.

v) Preparing vital records of births, deaths, reports of communicable diseases, etc. for mandatory and regulatory agencies, and statistical reports. These relate to number of admissions, discharges by major clinical services, discharge diagnoses and length of stay by diagnoses, types and number of surgeries performed, etc. for use by administration, medical staff communities and the education and research departments.

vi) Coding all diagnoses and operators according to international classification of disease for statistical purposes.

vii) Safeguarding the information in the medical records against theft, loss, defacement, tampering or use by unauthorized persons.

viii) Determining in coordination with medical staff and administration the action to be taken in medico-legal cases relating to the release of medical records in a variety of situations and determining the legality and ethical appropriateness of such actions in conformity with the laws of the land.

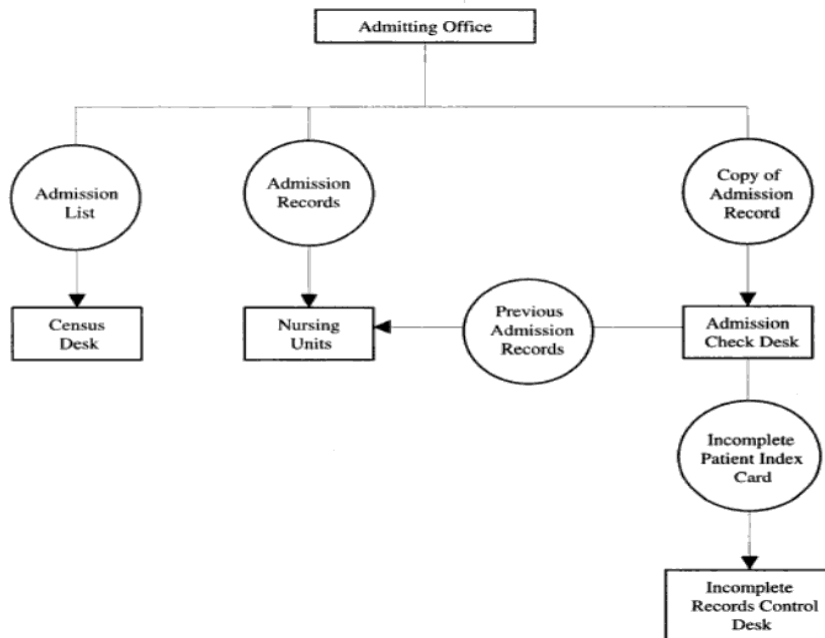
To appreciate the several activities that take place during the medical record's journey after admission and after discharge of patient, see flowcharts in Fig.1.1 and Fig.1.2.

1.3 Location

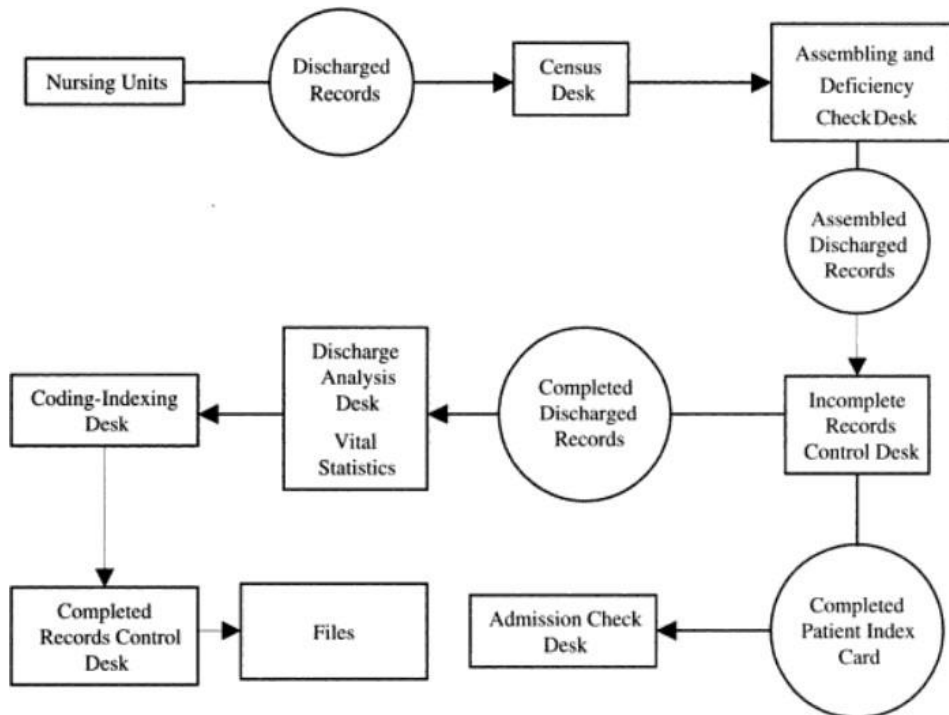
In order to provide prompt medical record service for the care of all patients at all hours and to foster a close working relationship and good communication among the related departments, the medical records department should be located close to the admitting area, outpatient department, emergency room and the business office.

It should also be close to or on the corridor leading to the doctor's lounge so that the medical staff can conveniently stop by and complete their records and study cases.

Proximity to admitting, outpatient and emergency departments eliminates delay in procuring medical records.



Flowchart of Medical Records on admission of a patient



Flowchart of Medical Records on discharge of a patient

It also permits a skeleton staff to manage the worse of the medical records department during the evening and night shifts.

While carrying on their normal duties like filing, etc. the night crew can also furnish records to the emergency department.

Location is important particularly in small hospitals where the records department usually remain closed during the night. In that case, it should be within easy walking distance for the authorized admitting or emergency department staff to enter the department and retrieve records for emergency patients.

The need for security surveillance to safeguard medical record information also has a bearing on the location.

The front office of medical records – the registration together with the enquiry – is often the patient's first point of contact with the hospital.

It is here that public relations plays a vital role.

In addition to courteous and helpful staff, the physical design should be one that projects a warm and welcome feeling.

Good functional design, logical placement of work areas and a good system of communication among the various sections of the department and between other departments are vital.

The department should also be designed with the best possible means of transportation of medical records through all stages of their use and processing.

1.5 Organization

The medical records department may be headed by a medical record administrator or officer who reports to the director for medical or administrative services.

He should be a graduate with a degree or diploma in medical records administration.

The remaining staff in the department consists of medical records technicians and medical records clerks.

The Christian Medical Association of India and various medical colleges offer degree and diploma courses in medical administration.

In large hospitals, there may be an assistant medical record officer and supervisor for major functional areas such as filing and indexing, coding and abstracting, transcription, discharge analysis, medical audit, utilization review and registration.

1.5.1 Unit Record

The unit record is a single record that documents the entire medical care provided to an individual in all the services of the hospital, namely, in the inpatient and outpatient sections and the emergency room.

The single unit consolidates and retains all the records in a chronological order, that is, in the order of occurrence of events and findings.

This way, the record provides the doctors with the necessary references to a patient's current and past conditions, all tests and procedures on him and his response to therapy.

Some hospitals maintain separate records for inpatient and outpatient visits.

The disadvantage of this system is that the patient's complete history cannot be reviewed quickly and easily.

Other methods of assembling medical records are:

- 1. Chronological by source** of information or section (physician's notes, nurse's notes, lab reports, etc.)
- 2. Problem-oriented medical record**

1.5.2 Numbering System

The most widely used method for numbering is the unit numbering, used in conjunction with the unit record system.

In this system, a single, permanent number is assigned for each patient (as against different numbers each time a patient is admitted).

The unit number ensures accurate identification of the patient and complete information about his investigation, tests and the accounting records.

1.5.3 Filing System

The most popular method of filing is the straight numerical filing, starting with the lowest number and ending with the highest.

Activities relating to filing and retrieving are most concentrated in the area where records with the highest numbers are stored because they are the most recent and active files.

This is the easiest method of filing as the staff is familiar and comfortable with it.

However, the chances of misfiling and not finding the misfiled charts are high in this system.

The other method of filing is the **terminal digital filing**.

This provides equal distribution of medical records in the storage area and therefore allows the staff to be evenly spread within the area.

The filing is based on the last two digits of the medical record number.

The entire file is divided into hundred sections from 00 to 99 and the records are stored in these sections according to their last two digits.

For example, all records ending with 14 are filed together.

In an advanced system, the terminal digits are also colour-coded.

The great advantages of this system is that the filing clerks can visualize the actual location of the records.

It also speeds up filing and retrieval of files and virtually eliminates any chance of misfiling.

1.5.4 Dictating and Transcription System

Various dictating and transcription systems are available.

In an advanced system, doctors dictate their notes or discharge summaries from various location in the hospital – from the wards, operating room, ICC & CCU complex, emergency room, etc. – using either a remote dictating equipment or the telephone which is linked to the central transcription room in the medical records department where the dictation is tape recorded.

The medical secretaries then transcribe the recorded dictation.

With the advances in telephones, doctors can now dictate their notes from anywhere from their homes or even from moving cars using car phones.

1.6 Space requirements

The medical records department requires space and facilities for the following:

1. Reception and registration area.
2. Offices for the medical records officer and assistant medical records officer.
3. Space for sectional supervisors.
4. Work area for record processing, assembling, numbering, indexing, utilization review, discharge analysis, correspondence, work processing, quality assurance, etc.
5. Record storage for active and inactive files.
 - Active files are the files where the data of discharge or last visit is within three to five years of the current date. These files should be readily accessible.
 - Inactive record storage should also be located near the active files area as far as possible. These may be stored in a computer assisted system.
6. Space for copies that is used to a considerable degree.
7. A room for medical staff to complete records, study cases review and abstract records with tables, chairs, dictating equipment, etc.
8. An area with bookcases or shelves to temporarily house medical records pending completion or temporarily used by the medical staff.

9. Transcription area with space for the central recording equipment, tables, computers, etc. for medical secretaries to transcribe dictation.
10. Space for master patient index depending on the kind of system used, for immediate identification of current and past patients. Computer-assisted system are now widely used.
11. Storage area for medical record carts.
12. Supplies storage area for unused medical record file folders, forms, etc.
13. Staff facilities.

1.7 Other Consideration

i) Ownership of Medical Records

Medical records are created and maintained for the benefit of patients, medical staff and the hospital.

The hospital has the right to restrict removal of the records from the records room or from the hospital premises, determine who may have access to them, and lay down as a policy the kind of information that may be taken from them.

Except for authorized patient care purposes within the hospital, medical records may be removed from the department only on the order of a court of law and with the prior permission of the chief executive officer.

Even when the records are given out, it is a wise policy not to part with the original records.

Only photo copies should be given except on the orders of the court.

ii) Confidentiality of Information

While the information contained in the identification section of the medical record is not confidential, the clinical data obtained professionally is confidential and it should be safeguarded.

Employees are obligated to safeguard the confidential information of patients.

Many hospitals require employees having access to patient records sign an undertaking not to divulge any patient information that may have come to their knowledge in the course of their work.

A great deal of harm can be done to patients by employees divulging confidential patient information.

Confidential information may be released with appropriate authorization.

However, the information acquired by a physician in doctor-patient relationship is privileged information that the physician may not disclose even in a court of law.

iii) Record Retention

Apart from patient care, records are retained for various reasons such as for legal and research purposes.

It is not necessary to retain records permanently for any purpose, and certainly not for the purpose of proving birth, age, residence, etc.

It is generally accepted that hospitals are seldom required to produce medical records older than 10 years for clinical, research, legal or audit purposes.

iv) Computerization

Computers are widely used in the access of registration and medical records.

In registration, they are used to maintain information and patient's personal data (demographics), for assigning patient numbers, making appointments and assigning to physicians, creating records, etc.

In medical records, computers can be used for patient records and medical records administration.

For the most part, however, computers have not made much inroads into the patient records area, but in the records administration area they are used for chart abstracting, medical record indexing, diagnosis coding, chart locating, master patient index, statistics, etc.

Authorized personnel can have access to all current and historical data. On-line abstracting can be done using screens and conditional editing. All editing is done in real time.

An on-line master patient index gives immediate access to essential, episodic patient information.

Medical records reporting gives optional access to essential, episodic patient information.

Reports can be sorted and sequenced in a variety of ways.

They can be generated on a daily, monthly, quarterly, semi-annual and annual basis.

2. CENTRAL STERILIZATION AND SUPPLY DEPARTMENT

2.1 Overview

Despite the unprecedented advances made in the medical field, hospital-acquired infection remains the hospital's single most serious concern that negates some of its otherwise good work.

It is acknowledged that even in advanced countries, approximately five percent of all hospital patients develop infection after being admitted.

Given the poor standards in our hospitals, this figure is likely to be much higher in India.

The intangible and tangible cost of this by way of unnecessary suffering, extra hospitalization and loss of working days can be high.

To combat this ubiquitous menace of infections caused by pathogenic micro-organisms, hospitals have over the years developed a scientific method commonly referred to as the central sterile and supply system.

The method basically involves cleaning, disinfecting and sterilizing before use all instruments, materials and equipment utilized in patient care.

From various parts of the hospital like operating room, wards, outpatient clinics and other departments, all soiled items are collected in the CSSD for processing, and then transported back to the end users.

In the CSSD, the process of cleaning, disinfecting, packing, sterilizing and distributing is carried out by specially trained personnel.

This ensures better control and reliable result and reduced risk of infection.

Sterilization of instruments, operating packs, trays, etc. is performed by heating them with pressurized steam or by gas sterilization.

Steam sterilization is called **autoclaving**.

However, certain items such as rubber, plastic and delicate instruments cannot be autoclaved and so have to be sterilized by using ethylene oxide or similar gases.

Gas sterilization requires certain safety precautions such as aeration prior to use and special exhaust ventilation.

Under both systems, sterilization is performed on cleaned instruments wrapped in special linen.

In the decentralized system, the sterilization facility is located near the area where the sterilized items are used.

This is called **Theatre Sterile Supply Unit (TSSU)**.

The advantage of this system is that it allow for direct communication, the number of instruments in small and transportation is more or less eliminated.

The CSSD services the nursing units, the operating rooms, ICUs, labour-delivery suites, the nursery, outpatient department, radiology, pharmacy and the clinical laboratories.

The primary activities of the department are sterilizing, storing and distributing the dressings, needles and syringes, rubber goods (gloves, catheters, and tubing), instruments, treatment trays and sets, sterile linen packs, etc.

Disposable sterile supplies are being increasingly used in hospitals They need only to

be stored and not processed for reuse.

Since these disposable items are expensive, their use in Indian hospitals has not significantly affected the workload of the CSSD.

2.2 Objectives

1. Process and sterilize equipments and materials under controlled conditions by trained and experienced personnel thereby contributing to total environment control in the hospital.
2. Effect greater economy by keeping and operating the expensive processing equipments in one central area.
3. Achieve greater uniformity by standardizing techniques of operations.
4. Gain a higher level of efficiency in the operations by training personnel in correct processing procedures.

2.3 Functions

1. Receiving and storing soiled material used in the hospital.
2. Determining whether the item should be reused or discarded.
3. Carrying out the process of decontamination or disinfection prior to sterilizing.
4. Carrying out specialized cleaning of equipment and supplies.
5. Inspecting and testing instruments, equipment and linen.
6. Assembling treatment trays, instruments sets, liner packs, etc.
7. Packing all materials for sterilizing.
8. Sterilizing.
9. Labelling and dating materials.
10. Storing and controlling inventory.
11. Issuing and distributing.

2.4 Location

Accessibility to elevators, dumb waiters and stairs is of utmost importance in determining the location of CSSD.

It should be close to the department which uses its services the most.

Generally, the largest users are the surgical department, including the recovery room, and the nursing units.

Hospitals are continuously searching for new ideas to maintain aseptic condition of the highest order, particularly in the surgical suites.

In advanced countries CSSD is located in a lower floor directly under the surgical suite.

The surgical suite and the CSSD are connected by means of two dedicated dumb waiters – small elevators that deliver trays, medicines, etc. – one sterile and the other soiled.

The sterile dumb waiter, located in the sterile area of the CSSD, opens into the sterile area of the surgical suite and transports all sterile items without being contaminated in transit.

The solid dumb waiter is located in the less sterile area of the surgical suite and brings down the soiled items to the soiled area of the CSSD for reprocessing.

2.5 Design

- The workflow pattern should be planned in such a manner that the personnel traffic and the movement of supplies and equipment is accomplished in an efficient manner, the flow of work is continuous from receiving to issuing without retracing steps, and the receiving and clean up areas are physically separated from the rest of the department.

- Workflow must be so planned as to allow a separate entrance to receive soiled and contaminated materials from departments, and another for issuing clean and sterile supplies and instrument.

- There could be a third entrance, if necessary to receive materials from general stories and laundry.

In a well-designed, state of the art CSSD, there are three organized zones:

1. Soiled area

2. Clean area

3. Sterile area

- Soiled items from various departments of the hospital are received at the solid reception area in the same trolleys, instrument trays, baskets or containers as they were delivered in.

- Most of them are loaded straight onto the pass-through washer-disinfector. Trolleys and some instruments are cleaned and disinfected manually.

- Steam and hot water are the most common of disinfection agents used in hospitals. In the clean area, clean disinfected materials are sorted, inspected and packed.

- After packing, the instrument trays are put into baskets for sterilization in the double- door, pan-through autoclaves.

- Fabrics are sorted out and packed in a separate area before sterilization.

- The double-door pan-through autoclaves of the required size are built into the wall between the clean and sterile areas.

- Materials are loaded on the clean side and unload on the sterile side.

- Both automatic and manual loading and unloading autoclaves are available.

- Autoclaves with formaldehyde and ethylene oxide for heat-sensitive goods and cycles for fluid production are also available.

- After sterilization, the autoclaves are unloaded in the sterile area and the materials stored there. The storage area should be dry and free of dust.

- It is advisable to have one high-speed autoclave, preferably in the operating room, to re- sterilize the instruments needed immediately or these that have been dropped accidentally.

- Flash sterilization is autoclaving an instrument when it is unwrapped. Plan of CSSD is given in Fig. 2.1.

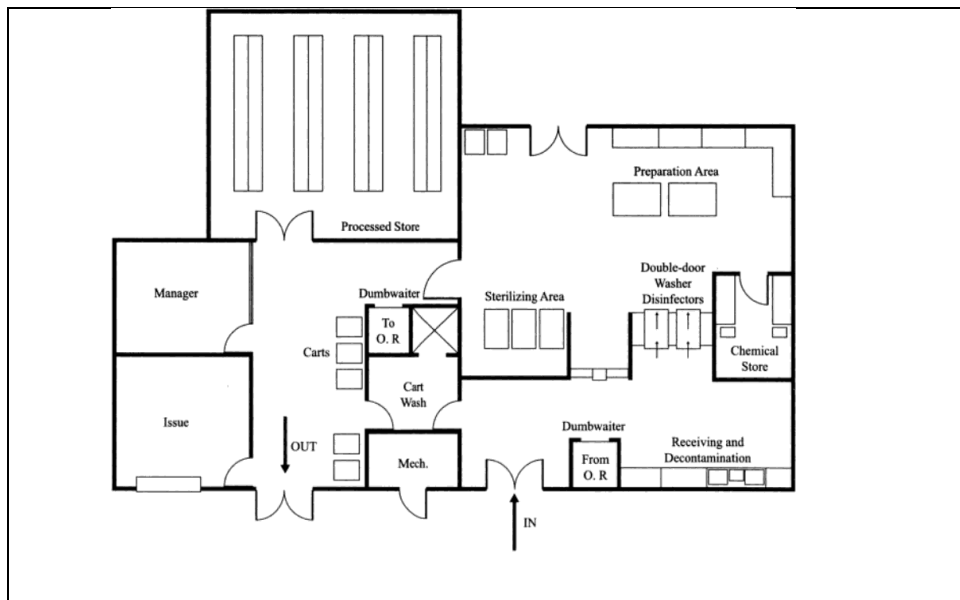


Fig. 2.1 Plan of CSSD

2.6 Some procedures

1. Cleaning and working of instruments, trays, etc., should be performed before reassembling and wrapping instrument kits.
 - Cleaning and waiting can be done with manually or by automatic washers.
 - Ultrasonic cleaners are considered most effective in cleaning joints, hinges, etc.
 - They, however, erode the surface of instruments and shorten their life.
2. Surgical linen is inspected before wrapping instruments or linen packs to check for holes, tears or rips by passing it over a light table.
3. Linen packs of sheets, drapes, wraps, etc. are assembled for operating room, labour rooms and delivery suites.
 - Special linen packs are prepared to suit special procedures such as laparoscopy, mastectomy and orthopaedic hip surgery.
4. Processing of instruments, one of the activities of the CSSD, includes assembling appropriate instruments and supplies into kits and wrapping the kits with sterile linen.
 - Kits and trays may be of various types, such as surgical instrument kits for operating room, suture kits for nursing units and emergency departments, cut down trays for nursing with and special trays for radiology.
5. Instruments used regularly are sometimes assembled to make pre-wrapped kits and stocked, or they are prepared when needed as per order.
6. Sterilization is done in batches, which means that several packages are sterilized in a single load.
 - For infection control, these packages are labelled, and dated, and later reviewed periodically against test indicators.
 - If a batch is found to be below standard, the packages are removed from the shelves.
 - A wrapped and sterilized kit is considered sterile for a certain length of time after which it has to be re-sterilized.

- The length of time a kit remains sterile depends on the type of wrap used, that is whether the kit is

wrapped with single or double thickness surgical quality linen.

- Labelling and dating of package is one of the important steps in the sterilization process.

7. The CSSD may also be engaged in the manufacturer of parenteral solutions, normal sterile saline solution and sterile distilled water.

- However, because of risks involved, only a few hospitals prepare parenteral solution.
- Even in the case of saline solutions and sterile water, the trend is to purchase them from outside in plastic pouch containers.
- These reduce breakage and are also convenient to handle.

2.7 Organization

Traditionally, CSSD has been a part of the nursing service department supervised by a nurse or a person with para medical training and reporting to the director of nursing or the nursing superintendent.

This pattern prevails in many hospitals.

It is also not uncommon for operating rooms to perform their own sterilization and not have much interaction with the CSSD.

The sterilization room is located next to the operating rooms so that sterile packs are transported easily.

In developed countries, the department goes by the name of “Central Service Department” and encompasses many other functions in addition to sterilization, such as purchasing, stocking and distribution of supplies under a materials manager or an assistant administrator.

Personnel in the CSSD comprise a supervisor who may be a nurse and one or two nurses.

The remaining staff typically consists of assistants, technicians, aides, orderlies and messengers who are trained on the job.

Usually in a new set-up with sophisticated equipment the firm that supplies the equipment trains personnel in handling it as part of a package deal.

There is now a growing trend towards putting the CSSD in the charge of an experienced manager.

The chief of CSSD is generally a member of the hospital infection control committee.

2.8 Facilities and Space Requirements

1. Reception control and disinfection area workspace and equipment are needed to clean and disinfected medical and surgical instruments that are sorted, racked and passed through washer-sterilizers to the clean area.
2. Facilities for washing and sanitizing carts.
3. Staff change rooms, lockers, toilets, etc.
4. Supervisor’s office. It should be out of the flow of activities but provide unobstructed view of the processing area. For this a glass-walled office is recommended.
5. Clean work area. Space for preparing special instruments, inspecting and testing instruments, equipment and linen for assembling treatment trays and linen packs for preparing gloves and for packing materials for sterilizing.
6. Assembling area. Requires workstations for assembling medical-surgical treatment packs, sets and trays, work benches with multiple drawers for instruments and supplies should be provided. The linen pack area requires large work tables, and for inspection, a special inspection (light) table for examining linen wrappers for minute instrument holes.

7. Supply storage area.

8. Double-door, pass-through autoclaves. These are high-vacuum steam and gas sterilizers.
9. Adequate space for loaded sterilizer carts or trolleys prior to sterilization for carts during the cooling period following sterilization and wherever applicable for carts for sterilized supplies for the surgical suites and labour-delivery suits prior to delivery of these supplies.
10. Sterile store.
11. Issue counter.
12. Clean cart storage area.
13. Provision for supply of steam, hot and cold water and other utilities and services.

3. PHARMACY

3.1 Overview

The pharmacy is one of the most extensively used therapeutic facilities of the hospital and one of the few areas where large amounts of money are spent on purchases on a recurring basis.

It is also one of the highest revenue-generating centres.

A fairly high percentage of the total expenditure of the hospital goes for pharmacy services.

This emphasizes the need to plan and design the pharmacy in a manner that results in efficient clinical and administrative services.

A good pharmacy is a blend of several things:

- qualified personnel,
- modern facilities,
- efficient organization and operation,
- sound budgeting,
- the support and cooperation of the medical, nursing and administrative staff of the hospital.

Automation, pre-packaging, unit dose drug distribution, decentralization are some of the methods that are being increasingly used in addition to computer-based ordering system, computer-assisted pricing, billing, cash collection checking of reorder level, out-of-stock and overstock over-stock position, expiry dates and a host of other functions.

Pharmacy is a specialized area and its operation calls for intimate knowledge of drugs and drug therapy.

Because of this and the amount of drugs and supplies involved, pharmacists usually handle their own purchases and stocking of drugs rather than leaving it to the purchasing department.

In large hospitals, there is a pharmacy and therapeutic committee of which the chief pharmacist is a member, to oversee the activities of the pharmacy.

3.2 Functions

The following are the primary functions of the pharmacy, some of which are performed directly by its chief:

1. Purchase, receive, store, compound, package, label and dispense pharmaceutical item.
2. Serve as a source of drug information to physicians, pharmacists and other health care professionals, and the patients. This involves compiling, storing, retrieving and disseminating drug information and providing pharmaceutical advice and consultation regarding drug therapy.
3. Participate in hospital's educational programmes.
4. Plan and organize the pharmacy department, establish policies and procedures, and implement them in accordance with the hospital's policies.

5. Serve as a member of the pharmacy and therapeutics committee, be actively involved in its functions and activities, and implement its decision.
6. Carry out research and participate in the evaluation of new drugs.
7. Participate in performing therapeutic assessment of drugs and in the preparation of a hospital formulary so that equally effective but less expensive drugs may be put on the formulary.
(A formulary is a list of drugs approved by the medical staff and the pharmacy committee for hospital use and kept in the inventory).
8. Keep track of drugs and formulations or combinations banned in the country and elsewhere, and keep abreast of WHO's revision of "essential list of drugs" and other notification.
9. Carry out quality assurance programme to ensure quality when in doubt of the efficiency or potency of a drug by sampling and analysing it either in the hospital or through the drug inspectorate.
10. Comply with statutory regulations, initiating licenses to be obtained maintaining records as legally required.
11. Wherever recognized, provide pharmacy students practical training which is in partial fulfilment of their course requirements.

3.3 Drug Distribution

The pharmacy distributes drugs primarily to nursing units, where they are administered to inpatients. Generally, the drugs distributed or dispensed by the pharmacy fall into three categories.

1. Drugs sent to the nursing units for floor stock inventory. These are items generally stored in the units for the use of patients but not charged to them.
2. Drugs that are sent to nursing units specified for individual patients as prescribed by the doctors and are changed to them. In most of our hospitals this is not done. Patients are asked to buy their medicines from the pharmacy which are then give to the unit nurse to be stored in medication carts with individual drawers for each patients.
3. Prescription drugs by the pharmacy on the strength of a prescription given by a physician. These are largely paid for in cash and represent the vast majority of drugs both in terms of quantity and cost.

3.4 Location

In determining the most suitable location for the pharmacy, the following factors should be considered:

- Flow of outpatient traffic through the hospital.
- Flow of drugs and other raw materials into the pharmacy.
- Flow of drugs and services from pharmacy to the inpatient areas and other departments.
- Need for future expansion.

These factors make it evident that pharmacy should be conveniently accessible from the outpatient department, central receiving store and the inpatient areas.

A ground floor location close to the outpatient department and to elevators servicing the inpatient areas is ideal.

It is assumed that the outpatient and inpatient dispensing activities are combined.

Many hospitals, however, find that when the outpatient department is the overriding consideration in determining the location of the pharmacy, the result is a less than optimal location for the inpatient dispensing activities.

They may soon find that one or more separate inpatient or satellite pharmacy facilities need to be established.

In many of our hospitals, inpatients are required to buy their requirements of medicines directly from the pharmacy on a cash down basis.

Medicines are not supplied and billed.

Every hospital, sooner than later, and much to its consternation discovers that its pharmacy facility is woefully inadequate.

Keeping in mind, the pharmacy should have at least one outside wall to allow the expansion, and must be adjacent to an area that can be relocated easily, for example, a storeroom.

3.5 Design

Each hospital must its own pharmacy and solve its individual pharmacy-programming problems, while adhering to the accepted norms of good pharmacy practice and legal requirements.

The pharmacy has 4 main functional areas:

1. Dispensing area
2. Production/ preparation area
3. Administrative area
4. Storage area

These areas must be designed and located for convenient access, staff control and security.

3.6 Organization

The head of the pharmacy services is usually a chief pharmacist who may possess a B.Pharm. or M.Pharm. degree and adequate experience.

He is normally responsible to the medical director or the medical superintendent.

In large hospitals, he may be required to work in conjunction with the pharmacy and therapeutics committee.

Every pharmacist has to register with the pharmacy council without which he cannot practise.

Other personnel in the pharmacy department are the registered staff pharmacists, pharmacy aides or helpers, pharmacy storekeeper and pharmacy clerks.

The normal working hours of the pharmacy in most hospitals are from 7.00.a.m to 11.00.p.m, seven days a week although some pharmacies provide round-the-clock service.

Where 24-hour service is not available, coverage during the late night (between 11.00.p.m and 7.00.a.m) is provided by on-call staff.

3.7 Facilities and Space Requirements

3.7.1 Dispensing Area

1. Patient working area. It should be recessed so that the usually large waiting crowd does not obstruct the free flow of traffic on the corridor nor is it jostled by it.
2. Patient dispensing counter, preferably glass panelled with pan-through windows, with space for computer-assisted pricing, billing, and receiving cash on one side and for dispensing on the other.
3. Active storage. Adequate space for a large number of active drugs stored in routine shelves laid out efficiently.
4. Pick up and receiving counter and space for temporary storage of carts.
5. Area for review and recording of drug orders.
6. Extemporaneous compounding area.
7. Work counters and cabinets for pharmacy activities.
8. Refrigerated storage.
9. Storage for alcohol and for volatile and flammable substances.
10. Second storage for narcotics and other controlled drugs.

11. Space for maintain patient medication profiles and cross-checking of medication, for providing drug

information, and a room for pharmacist to meet patients who require extensive consultation, instructions or counselling, if these functions are performed.

3.7.2 Manufacturing Area

1. Bulk compounding area.
2. Provision for packing and labelling.
3. Provision for packing assurance activities.
4. Clinical sinks and hand washing facilities.

Preparation of parenteral fluids comes under the mandatory regulations of the Drug Control Act that has now been made stricter and more comprehensive.

Hospitals which want to manufacture these fluids are advised to thoroughly study the regulations and procedures.

3.7.3 Administrative Area

1. Reception and clerk-typist's area for clerical functions including filing, communication, references, etc.
2. Chief pharmacist's office and office space for assistant chief pharmacist and clinical pharmacist.
3. Waiting area for visitors, medical representations and salesman.
4. Conference room-cum-library.
5. Staff facilities like lockers, toilets, lounge, duty room for on-call duty pharmacists, etc.

3.7.4 Storage Area

1. Bulk storage.
2. Active storage.
3. Refrigerated storage.
4. Volatile and alcohol storage.
5. Secured storage for narcotics and controlled drugs.
6. Storage for general supplies, equipment, filter, stationary, etc.

3.8 Other Considerations

Traditional pharmacy services are rapidly undergoing a change all over the world, especially in the dispensing and distribution system.

Many innovative approaches and methods have been introduced in recent years.

Though not all hospitals can implement these changes, it is hoped that some of the larger and progressive hospitals in our country will introduce and test these newer systems and set the pace for other hospitals, some of these changes are described below:

i) Clinical Pharmacy

In most of our hospitals, the pharmacy is engaged in traditional activities such as drug ordering, preparation, distribution and dispensing.

Of these, dispensing prescription as ordered by physicians is the most important.

Except for monitoring drug incompatibilities occasionally, pharmacists have no role in determining what to order.

But hospital pharmacists are now increasingly becoming involved in what is called "Clinical Pharmacy".

This includes activities like taking medication history, monitoring drug use, drug selection, patient counselling and surveillance of adverse reaction of drugs.

In other words, they are becoming involved in determining what to order, thus becoming a part of the team effort in determining treatment.

ii) Unit Dose Dispensing System

Another important change that has taken place in the field of pharmacy is in the medication dispensing system – from the traditional pharmacy system to a considerably refined unit dose system.

In the traditional system, the pharmacy sends to each patient in the nursing unit, several day's supply of medication.

The nursing unit then prepares the individual dose from the supply.

In the unit dose system, the doses are premeasured by the pharmacy so that the nurse has only to administer the medication.

The system uses a cassette mechanism that designates one drawer for each patient in the medication cart or cabinet.

The nurse rolls the unit dose cart to each individual patient room, removes the dose of medication to be given from the respective patient drawer in the cart, and administers it to the patient.

In the emergency cart maintained in the nursing units, certain drugs are kept in single- dose packages that are ready and convenient to administer.

While the unit dose system is expensive-initial one-time cost largely involves the purchase of unit dose carts and packaging equipment and increased pharmacy personnel these are several advantages.

It reduces nursing time for pouring, counting and dispensing, reduces medication errors, and increases control and recording of medication by the pharmacy.

iii) I.V Additive System

The concept of a unit dose system can be extended to intravenous (IV) solutions, for which there are two methods:

- The traditional method
- IV additive method.

The activity relates to mixing medications with IV solutions.

In the traditional system, IV solutions are stocked in the nursing unit.

Medications are sent to the unit by the pharmacy, and the nurse mixes or adds medications to the IV solution.

In the additive system, the medications and the IV solutions are mixed in the pharmacy itself.

The pre-mixed bottles are then sent to the nursing unit and the nurse merely administers the solution.

As in the case of the unit dose system, this saves the nurses time and prevents wastage and medication errors.

iv) Pharmacy and Therapeutics Committee

Every hospital should have a pharmacy and therapeutics committee consisting of physicians representing the various divisions of medical staff, pharmacists, and representatives of administration, to oversee the work of the pharmacy.

The following are some of the duties and responsibilities of the committee:

1. Develops a formulary of accepted drugs for use in the hospital.
2. Serve the medical staff, pharmacists and hospital administration in an advisory capacity in all matters pertaining to the use of drugs and in the selection of drugs to be stocked.
3. Evaluate clinical data concerning new drugs requested to be included in the formulary and for use in hospital.

4. Add or delete specific drugs from the formulary.

5. Prevent unnecessary duplication of the same basic drugs to be stocked.
6. Recommend drugs to be stocked in the nursing units and other areas.
7. Study problems or reported adverse reactions to the administration of drugs.
8. Issue communication(s) to physicians, pharmacists, nurses and administrative staff regarding proposed change in the formulary such as addition to and deletions from the list, changes in the working of the system and in the contents of the formulary.
9. Adoption of a policy that the inclusion of drugs in the formulary should be by their non-proprietary names.
10. Ensure that the labelling of medication containers be by the non-proprietary names of the contents.
11. Issue written communication to the nursing and pharmacy staff regarding the existence of a formulary in the hospital and the policies and procedures governing its operation.
12. Issue guidelines for the control, appraisal and use of drugs not included in the formulary, investigational drugs and non-formulary drugs.

v) Hospital Formulary

One of the major responsibilities of the pharmacy and therapeutics committee is to develop or adopt a suitable formulary of selected medication.

A formulary is the official compilation of drug products that have been selected and approved for use within the hospital.

The two main objectives of the formulary are:

1. It promotes rational therapeutics
2. It prevents unnecessary duplicates, waste and confusion and thus promotes economy for both the hospital and the patient.

When many brands of the same drug are stocked and prescribed, it results in a loss to the patient as well as to the hospital.

It should be remembered that a mere list of medications placed on the shelves does not constitute a formulary.

The drug list should be expanded to include specifications about how a medication should be used.

Formularies should also include recommended daily dosage and cautions, warnings, restrictions, pharmacology and other similar information to facilitate correct use of drugs.

The following steps are some of the steps involved in the process:

1. Appointment of a pharmacy and therapeutics committee by the medical staff composed of physicians, pharmacist(s), and representatives of the administration.
2. Outlining the purpose, organization, function and scope of the committee and an organized method for this committee to evaluate the therapeutic claims of competing or suggested drug products.
3. Periodic publication of authorized drugs.
4. Procedures for revising the list.

3.9 Problem Situations: - Theft in Pharmacy

The pharmacy is one of the most theft-prone places in the hospital and what is worse, pharmacy theft can be costly, difficult to check and may go unnoticed.

Theft is usually by the employees themselves or in collusion with them.

The most common points where thefts take place are the dispensing area, stores, purchasing process, receiving and invoice payment and the nursing units.

Substantial losses may take place in the dispensing and purchasing areas and continue for a long time without being discovered.

The chief pharmacist or the person responsible for purchasing may in collusion with the vendors, manipulate supply or bills and divert part of the supply to privately owned drug stores. With an incredibly large number of items kept in open shelves of the dispensing pharmacy, the task of exercising any meaningful control over the drugs is a formidable one even with all checks and balances and control measures.

The problem becomes serious during evening and night shifts when there may be only one pharmacist on duty and even more serious when, in smaller hospitals, the pharmacist doubles up as the cashier as well.

Every hospital must recognize that it has a moral obligation to make theft and fraud as difficult as possible; if not altogether impossible by instituting proper control systems.

Too often, the general climate in the hospital provides ample scope for employees to indulge in such activities without anybody taking cognizance of such offences or punishing the offenders.

A sound system of controls acts as a deterrent and creates fear in the employees that frauds and thefts will be detected and punished.

4. FOOD SERVICES

4.1 Overview

Good food is important in the treatment of the patient and in a part of his total care.

The food service department in today's modern hospitals ranks as one of the major departments.

It is headed by a specialist who is either a professional manager or a chief dietitian.

Most people tend to pass judgements on the cleanliness of the hospital, the personnel care and attention given to them as patients and visitors and on the quality of food.

The coffee shop is one of the places where a visitor often stops by on entering the hospital and it sets the overall impression of the hospital for the first-time visitor.

An irritated customer may give vent to his feelings at the patient's bedside and look for faults in patient care.

Hospitals have long recognized the public relations value of the food service department.

Unfortunately, criticism of food is one of the most frequently heard complaints in any hospital.

The major share of this criticism can be avoided by a properly planned and administered food service department.

4.2 Functions

1. Provide the best possible food at a cost consistent with the policy of the hospital.
2. Buy to specifications, receive supplies, check their quantity and quality, and store, produce, portion assemble and distribute food.
3. Establish standards for planning, menus, preparing and serving food, and controlling meals. Standards must be established before setting up food purchase specifications.
4. Establish policies, plan layouts and equipment requirements.
5. Plan and implement patient therapy, education and counselling; advise patients and their families on special dietetic problems prior to their discharge from the hospital or when referred from the outpatient clinics.
6. Train dietetics interns.

7. Impart instructions to nurses, medical and dental students, interns and residents about principles of nutrition and diet therapy.
8. Cooperate with medical staff in planning, preparing and serving experimental metabolic research diets.

4.3 Location

Earlier, hospital kitchens were generally allocated space unusable for any other purpose.

A food service department located below the ground level is certain to have a deleterious effect on the quality of food and efficiency of the department.

A kitchen in the basement, for example, is likely to be dingy, dark and poorly ventilated. A ground floor location is preferable, and is more convenient to deliver supplies.

Current cooperation/municipal by laws in most places prohibit locating kitchens in basement floors.

Older hospitals that had their kitchens below the ground level found themselves in a quandary when municipalities in cities started enforcing this rule.

The department should be close to the materials management department and the storage area should be close to the unloading dock.

Easy access to vertical transportation system serving patient care units is important to facilitate delivery of patient meals and return of used trays and utensils.

The cafeteria and dining room should be close to the food preparation and production area and within convenient access to the hospital staff.

4.4 Design

The design and physical facilities of the food service department have an important bearing on the standard of food service, labour costs and the morale of employees.

For example, storage rooms far removed from the work area, poor arrangement of the preparation and production areas for work flow and a long travelling distance for prepared food lower the employees efficiency levels and increase unnecessary steps resulting in increased costs.

In general layout, the most important factor to be borne in mind is the logical work flow- receiving supplies, storing and refrigerating them, preparing and serving food, returning trays and washing dishes.

There should be adequate space and facilities to perform the work in each of these functional areas.

Fig. 4.1 shows a typical food service department flowchart. Fig. 4.2 shows a plan of food service department.

4.5 Functional Areas

i) Receiving Area and Control Station

The food service department requires a substantial amount of supplies and materials.

The receiving area that may be common to other hospital supplies and should be large enough for handling bulk supplies.

The receiving clerk inspects and checks all the supplies both for quantity and quality.

In the case of dietary supplies, the director or a staff member of the food service department personally checks the supplies.

The receiving area should be equipped with scales to weigh materials and supplies.

All internal control measures described under materials, management apply to this area too.

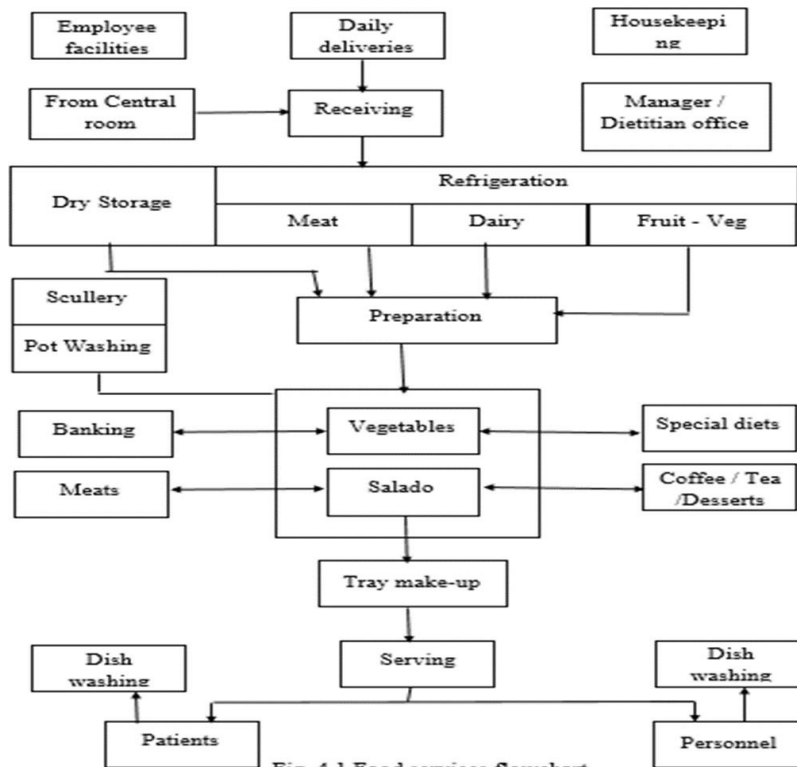


Fig. 4.1 Food services flowchart

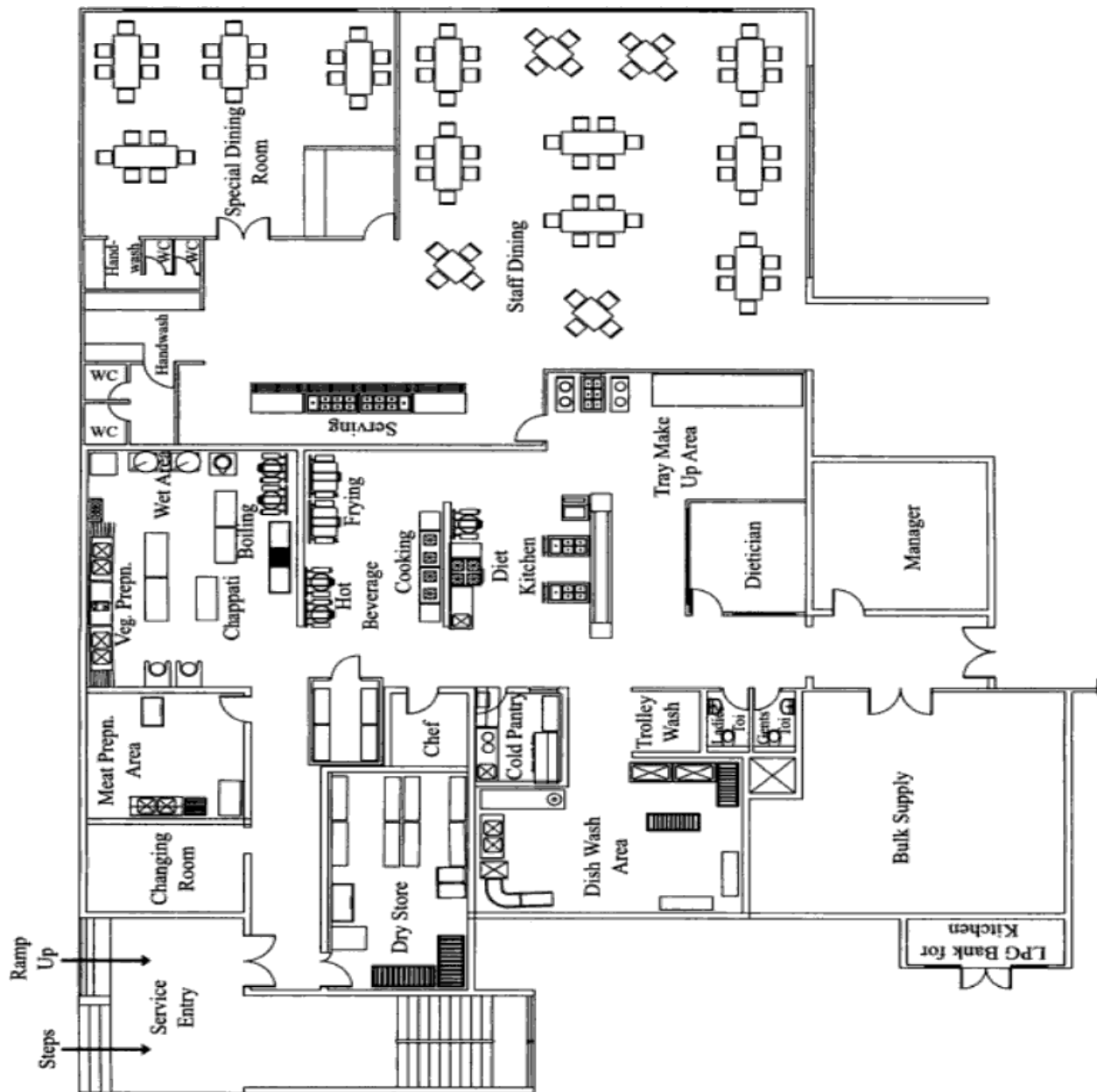


Fig. 4.2 A typical food service department

ii) Storage and Refrigeration Room(s)

- The storage area, which comprises dry and refrigerated storage, should be adjacent or close to the receiving area.
- Dry storage is for staples and refrigerated storage for perishables. Hospitals generally stores several days' supplies to meet any eventuality. Some dry foods are bought and stored in bulk.
- Wooden, or steel racks and platforms are used for storage.
- Large hospitals have walk-in coders and refrigerators with varying degrees of temperature for meat and meat products and poultry, dairy products and eggs and fruits and vegetables.
- As in restaurants, it is a common practice in such hospitals to freeze all leftover foods for later use.
- The refrigerators should have a thermometer in each unit to check temperature daily.
- The walk-in refrigerator should also have an alarm connected to a place with a 24-hour personnel coverage in case someone gets locked imide accidently.

iii) Preparation and Production Areas

- Some hospitals prefer to have a separate pre-production preparation area where sorting, peeling, slicing, chopping and washing may be done prior to cooking.

- A double sink with draining boards, worktops, peelers and grinders are the necessary facilities and equipments.
- There should be efficient arrangements in the production area so as to permit the best workflow and minimum cross traffic.
- Special attention should be paid to the size of the production area.
- Early in the planning stage, it should be decided whether the hospital will serve only vegetarian food or non-vegetarian food as well.
- There should be a separate kitchen for non-veg foods.
- Some raw foods, when cooked may produce disagreeable odours and also taint other food. This may be necessary to handle separately.
- Food in hospitals is prepared using the progressive approach.
- In progressive cooking, food is prepared in small batches at regular intervals during the serving-time. This provides freshness and palatability and the food remains hot. The essentials of good production are:
 - Good physical layout that ensures easy flow of work.
 - Use of standardized recipes.
 - Correct techniques of preparing each kind of food that preserve natural flavour and nutritional value.
 - Progressive cooking and preparation in the shortest possible time.
 - Good management and supervision.

iv) Serving Room

The serving room is a place where patient food trays are assembled or made up. It receives prepared food in bulk from the kitchen and the refrigerators.

After the trays are assembled, they are loaded on to tray carts or food trolleys and sent to the patient floors.

It is imperative that the serving area be close to the elevators.

The equipment and facilities in the serving room includes refrigerators, table-tops and cupboards for storing trays, dishes, cutlery and other articles necessary for assembling trays.

The dietitian has the overall responsibility for inpatient food.

She has the last immediate duty of checking the trays for proper identification, accuracy and temperature of foods and ensuring that the food is palatable and served attractively.

v) Food Delivery

Food trolleys that can be plugged into an electrical outlet to keep the food hot are now available.

An airline track is a tray truck with separate heated and refrigerated sections for hot and cold foods, and bulk thermal containers for liquids.

The hot bulk cart contains hot food in bulk that is dished on to the patient trays on the patient floors.carts.

Many hospitals distribute foods in individual hot food containers carried in open food

Smaller hospitals may serve them in ordinary tiffin carriers. Beverages like coffee and tea are poured in the patient rooms.

Whatever the method of distribution is used, the patient serving should not take more than 45 minutes; if it does, the system should be evaluated.

vi) Special Diet Kitchen

This is an integral part of the hospital kitchen.

The special diets should be prepared under the supervision of a qualified dietitian the actual preparation being

carried out by student dietitians or interns as part of their training.

Since special diets are usually modification of the basic menu and since the special diet kitchen derives its supplies from the main kitchen and transports the trays through the same tray carts, it should be located in the main kitchen or close to it.

It also requires pots, pans vessels, etc. like the main kitchen but on a much smaller scale. In addition, it requires scales for weighted diets.

vii) Dishwashing Area

Dishwashing, an otherwise noisy job, is made easy with large modern dishwashing machines.

In these, a continuous stream of soiled dishes are loaded at one end and clean dishes unloaded at other side.

Wire baskets may be used to place glasses and cups in individual compartments.

In smaller hospitals, washing of dishes, etc., is generally done manually in the scullery. An abundant supply of hot and cold water should be piped to the dishwashers and sinks. Drainage and plumbing should be well engineered.

Soiled dishes are brought to the dishwashing area and scraped. The waste is collected in a garbage receptacle.

Dishes are then checked and placed in dishwashing trays, and loaded for washing. After this, they are stacked in appropriate places for reuse.

viii) Pot Washing Area

Washing of pots, pans and utensils is usually done by hand. It is best done in a separate room.

The place must have deep sinks, abundant supply of hot and cold water and drying racks.

Pots and utensils should be identifiable so that they can be returned to their respective user units.

ix) Cafeteria

While accepting the proper nutritional care of patients as the primary responsibility of the food service department, most hospitals also provide food to non-patients and non-patient areas, such as the hospital staff, visitors and patient bystanders.

They also cater to functions and meetings through the cafeteria, coffee shop and the snack bar.

In planning the cafeteria, the following factors should be considered:

1. The number and kinds of groups to be served-day staff, resident medical and nursing staff, visitors, patient attendants and bystander.
2. Whether these should be separate dining rooms for medical staff, officers, VIPs and other staff.
3. Types and extent of food selection-vegetarian or non-vegetarian, number of food items, a complete meal for a fixed price or items by selection
4. Kind of service – self-service at the counter or table service; whether there should be a separate counter for doctors.
5. Size of the dining room and number of shifts – whether all persons can be accommodated in two or three sittings during a one or one-and-a-half-hour meal period.
6. Method of clearing table. If self-service, whether personnel will be required to return their trays to a designated area, e.g. a trolley or a cart, and whether they will be required to dump garbage in the garbage bin before depositing the trays.

The hospital cafeteria works like a fast food business operation – cash down.

The customers buy coupons at the counter, pick up food items in exchange for them, carry their trays to the tables and eat.

Alternatively, they pick up their food items in a tray and pay the cashier who will be seated at the far end of the food counter.

The hospital cafeteria should be designed for this kind of operation.

A customer-oriented menu is the key to the successful management of a hospital cafeteria.

The chief of food service must recognize certain fundamental principles that ensure an efficient and profitable running of the cafeteria. They are:

- Satisfaction of the customers who enjoy good food. In the case of hospitals, they are more of semi-captive customers.
- Variety in food. Patients may or may not be accustomed to luxury but most of them are used to variety in their diets at home. If it is not provided, they may quickly develop a distaste for the food.
- Purchase of high quality food at economical prices.
- Receiving and storing food supplies properly.
- Exercising effective control on supplies at the point of receiving, storing and issuing.
- Preparing foods according to standard recipes and standard quality and serving them attractively in standard portion.
- Accounting for sale of food.

x) Coffee Shop and Snack Bar

The coffee shop and snack bar should preferably be away from the main kitchen and dining rooms to cater largely to in-between-the-meals coffee, tea and snacks to outpatients, visitors and personnel.

This way, the main cafeteria can remain closed except for breakfast, lunch and dinner as keeping the whole cafeteria open over two shifts is costly.

The coffee shop should be easily accessible to outpatients, particularly emergency patients.

This is important in the night when the cafeteria is closed and the patients need refreshments.

It should be designed like a fast food restaurant for a quick turnover of patrons and not as a lounge where people settle down for an informal chat over a cup of coffee or tea.

4.6 Organization

Traditionally, a dietitian has been the chief of the food service department, also called the dietary or nutrition department.

But in larger hospitals, professional managers with degrees in management and food service or hotel management are now becoming more common with dietitians as the dietetic supervisor.

In smaller hospitals, the dietitian may serve a dual role as both dietetic supervisor and department manager.

The manager usually reports to one of the associate administrators.

The department has two main functional divisions: one relating to the administration of the department and food production, and the other relating to therapeutic food service and instructions to patients, and their counselling.

Administrative duties ranging from purchases to planning of menus occupy most of the manager's time.

The therapeutic duties include diet therapy, planning patient menus and special diets, supplying a special diet list to patients and counselling.

Educational activities include teaching students and training dietitian trainees. The bulk of workers in the department are unskilled.

The trend in hospitals is to employ workers at the lowest salary level

The results in instability, lack of responsibility, and poor quality of work. The department is often a hotbed of unions and union activities.

Many hospitals make it mandatory that those working in the food service department undergo physical examinations regularly to ensure that they are free of communicable diseases.

Dietary aides, if properly trained, can perform a variety of functions such as checking supplies, writing requisition, checking and reporting census, making out time schedules, checking routine tray line, and making out charge slips.

Early in the planning and design development stage, hospitals should decide as a matter of policy whether hospital food is to be compulsory for all patients or whether they can bring food from home, perhaps with the exception of special diets.

The size of the department and the primary functions of this department.

- It is the determination of meals that are to be served to the patients and the non-patients.
- Cycle menus that are commonly used consists of a series of skeleton menus to be served over the length of the cycle-weekly, biweekly, or monthly.
- Variations are sometimes made to take advantage of seasonal foods.

Some progressive hospitals allow the patients to select their own meals using menu cards as in restaurant.

Dietitians help patients in giving their orders.

Therapeutic nutrition requires a qualified dietitian to assist in patient therapy.

In most cases, nutrition therapy, as ordered by a physician, requires modification of the normal diet in its content, consistency and preparation.

Therapeutic and special diets and meals should be clearly marked, preferably by colour coded labels.

4.7 Facilities and Space Requirements

1. Food service manager's office. It should offer an unobstructed view of all the parts of the department, and be ventilated and preferably soundproofed.
2. Secretarial, clerical office with space for file cabinets and other equipment, seating for visitors, vendors, etc.
3. Office space for chief dietitian and staff dietitians. Some hospitals locate the office of therapeutic dietitians on the patient floors so that they can be available quickly to the medical staff and patients.
4. Receiving area.
5. Storage and refrigeration area with walk-in refrigerators, coolers and drug storage.
6. Pre-production preparation area.
7. Cooking or food production area, separate for vegetarian and non-vegetarian foods.
8. Special diet kitchen.
9. Tray assembly or make up area.
10. Dishwashing area.
11. Pot washing area.
12. Trolley, cart washing area and clean act storage area.

13. Deep sinks and hand washing facilities in various places.
14. Garbage disposal facilities.
15. Storage with racks and cabinets for clean trays dishes, cutlery etc.
16. Storage with racks for clean pots, pans, vessels, etc.
17. Employee facilities like lockers, staff toilet, etc.
18. Janitor's closet.
19. Dining hall with self-service counter, cashier's booth, clean tray storage area, seating for adequate number of people, used tray depositing area, hand washing facilities, drinking water fountain, etc.
20. Special (private) dining rooms for officers, medical staff, special guests, meetings, etc.
21. Coffee shop/snack bar, preferably off site.

4.8 Problem Situation

4.8.1 Conflicts

Conflicts often arise between the food service staff and the nurse service staff and the nursing and admitting staff when patient admission, discharge and transfer result in last minute requests, cancellation, or changes in preparation and delivery of scheduled meals.

Sometimes, food gets wasted.

A degree of tolerance, understanding and effective communication will help reduce such conflicts.

Another point of conflict between the food service and nursing department is who should pass and pick up patient trays. This is an administrative decision.

It is hard to provide a menu that pleases everyone.

Complaints against the food service department are common and frequent.

The work of the department is rendered more difficult because of the need to contain costs.

Dietitians can play an effective role in this regard both in the preparation of the menu and in talking to patients, especially in the matter of special diets which may not always be palatable or pleasing to the eye.

Many hospitals provide subsidized food to personnel and charge a much lower rate to them to visitors and patients.

Some hospitals provide free food to employees of the food service department while on duty.

Most hospitals like to continue this tradition, but it because of the rising cost, they have to reduce or abolish the subsidy, and it may breed resentment among employees.

4.8.2 Theft

Petty theft and pilferage are common in the food service department.

These mostly involve food dishonest consumed on the premises, stealing patient food, eating food left in patient trays, and pilfering food from the store room and pantries on the patient floors.

The biggest offenders are the employees of the department, housekeeping, maintenance personnel and guards.

An effective method to curtail this is to lock the place where food is stored. Good supervision is necessary.

Bigger frauds can take place in materials management level, particularly in the purchasing process.

5. LAUNDRY SERVICES

5.1 Overview

Laundry and linen service is one of the vital department of the hospital.

Criticism of linen service is one of the most frequently heard complaints in the hospital. Attention to patient's personal needs and comfort is as important as the physician's medication, the care tendered by the nurse and appetizing food served promptly and attractively.

An adequate supply of clean linen sufficient for the comfort and safety of the patient thus becomes imperative.

Besides helping in maintaining a clean environment which is aesthetically significant to patients, clean linen is a vital element in providing high quality medical care.

The other aspect of this is the personnel appearance of the staff who attend on patients.

Pleasant, neatly-dressed employees in fresh, neat, uniforms go a long way in creating a positive image of the hospital.

A reliable laundry service is of the utmost importance to the hospital. In today's medical care facilities, patients expect daily linen changes. In some areas, linen has to be changed even more frequently.

This rigorous schedule can be very exacting on both the laundry and the capacity of linen to withstand repeated cycles of use and wash.

To enable the laundry to meet such a demand, the hospital should have a sufficient quantity of linen for circulation and to provide a rest period in storage.

5.2 Functions

1. Collection of or receiving soiled and infected linen.
2. Processing soiled linen through laundry equipment. This includes sorting, sluicing and disinfecting, washing, extracting, conditioning, ironing, pressing and folding.
3. Inspection and repair of damaged articles, their condemnation and replacement.
4. Assembling and packing specially items and linen packs for sterilization.
5. Distributing processed linen to the respective user departments.
6. Maintenance and control of active and back-up inventories and processed linen.

5.3 Location

The laundry should be located as to have ample daylight and natural ventilation.

Ideally, it should be on the ground floor of an isolated building connected or adjacent to the power plant.

This is because laundry is one of the largest users of power, steam and water.

A location that allows movement of linen by the shortest route saves effort and time. The department should also be close to service elevators.

Some hospitals have chutes through which linen bags are dropped to a designated place from where they are picked up by laundry personnel.

Every time a load of linen is handled, the cost of laundry services goes up. The location and physical plan are important in keeping the cost down.

One way of doing this is to keep the traffic flowline as short as possible on vertical and horizontal transportation between the laundry and the user departments.

This can be more easily accomplished in a vertical multi-storeyed building where the services are in the basement.

5.4 Some Planning Elements

5.4.1 Size of Active Inventory.

In planning and maintaining linen stock, a stratified inventory system is generally used.

This means that for every piece of linen in use, there are four others either being processed or held in store.

Therefore, the active inventory consists of items used daily multiplied by five.

For example, for each hospital bed in use, one sheet or pillowcase will be found in the following places:

- A soiled one is use on the patient's bed.
- A clean one in the linen closet in the nursing unit.
- A soiled one in the hamper or dirty linen collection area.
- One piece being processed in the laundry.
- A clean one in the linen store or back-up store for replacing active store.

5.4.2 Laundry capacity and Load

A final assessment of the plant and machinery required for a laundry can be made only by compiling a list of types and quantity of articles to be laundered weekly.

At the planning stage, the information required can be projected by using the following guidelines:

1. **American Standard:** An average of 15 pounds (6.80 kilograms) per bed per day plus 25 pounds (11.33 kilograms) for each operation or delivery.
2. **British Standard:** 60 articles per bed per week at 0.39 kilogram per article.
3. **Indian Standard:** the rule of thumb is three to five kilograms per bed per day. All soiled linen in

hospitals can be classified into two categories:

- a) Ordinary or normally soiled linen
- b) Fouled or infected linen

All babies' soiled napkins should be treated as infected.

For arriving at the actual daily workload, the total load of seven days soiled linen should be washed on six working days of the week.

The laundry should have the capacity to process at least seven days collection within the regular six-day workweek.

Soiled and infected linen comprises large flats (sheets, etc.), small flats (pillowcases, etc.), tumble work (both towel, bedspread. Blankets, etc.), presswork (garments, etc.), operating room and obstetrical linen, nursing and paediatric linen, and isolated linen.

5.5 Design

- The laundry functions effectively only when it is planned strictly in accordance with the work sequence, namely, receiving, processing and dispatching.
- Fig. shows the flowchart of the laundry showing trends of traffic.
- The activities of the hospital laundry are in many ways similar to those in hotels and other institutions.
- However, the hospital laundry also handles speciality items and tasks.
- The most important of these being disinfection and infection control because hospital laundry processes not only ordinarily soiled linen but also infected or fouled linen.
- It should be designed for asepsis and for removal of bacterial contamination from linen.
- Hospital planners and administrations by and large fail to see that the layout and system of processing linen in a hospital laundry should follow the principles involved in the central sterilization and supply department.

- There should be a strict barrier separation between the normally soiled linen and fouled or infected linen on the one hand, and between the soiled area and the clean processing area on the other.
- The latter can be accomplished by installing double-door, pass through washing machines in the wall separating the soiled area and the clean processing area.
- Linen is loaded on the soiled side and unloaded on the clean side.
- This physical separation of soiled and clean areas has an important bearing on the design of laundry and infection control.
- Traditionally, the various steps involved in the processing of linen are carried out, in the same room as, say, in a hotel laundry.
- An enormous quantity of bacteria is released into the air of the processing area while sorting linen before wash.
- This airborne contamination pervades the whole area and eventually settles down on clean processed linen that is delivered to the patient care areas.
- This should be avoided by separating clean and soiled areas. The plan of a hospital laundry is given in following Fig. 5.1.

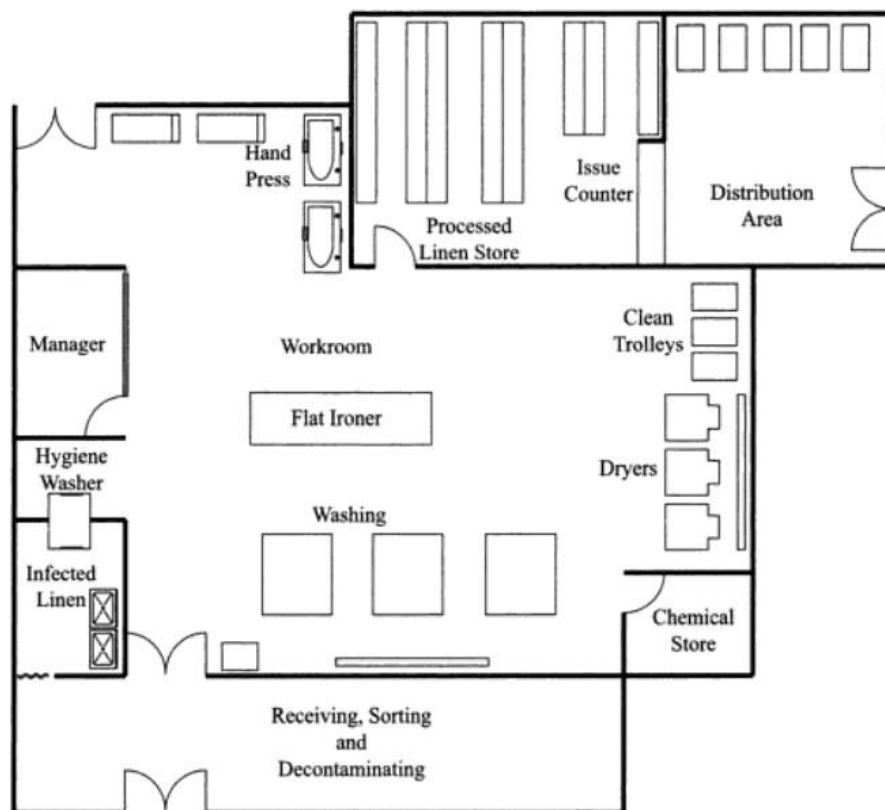


Fig. 5.1 Plan of a Laundry

5.5.1 Disinfection Area

- Fouled or infected and normally soiled linen should be handled and washed separately.
- Fouled and infected linen goes to one section of the reception-control area where it may be temporarily stored and later sorted and loaded into washing machines.
- This area should be separated from the rest of the reception area and from the post-wash clean area of the laundry.
- This latter separation is best done by double-door, pass-through washer-extractor machines installed in the barrier wall.
- Some laundries provide a separate slicing machine for sluicing and disinfecting before they are loaded into the washing machine on the clean side of the reception-control area.

• The normally soiled linen is stored, classified and loaded into the washing machine on the clean side of the

reception control area.

- Some hospitals use a double door pass through a hygiene washer for infected or fouled linen at the initial decontaminating stage of washing.

5.5.2 Utilities

- Early in the planning and design stage, a careful study and projection of the utility and services needed for the laundry should be made.
- The important requirements are water, power, steam and compressed air. Laundry consumes a great deal of water.
- There should be a source sufficient to meet the entire need. Discharge of effluents should also be dealt with at the earliest stage.
- Adequate power must be available. Hundred percent of the normal power should be provided as standby.
- Adequate quantity of steam and correct temperature are also important.
- Steam should be delivered by the shortest route to minimize line losses and at the same time provide ample heat to flat work ironers and presses.
- The laundry also needs compressed air to operate these flat work ironers and presses.

5.6 Organization

- The operational chief of the laundry is a laundry manager who may have been trained in laundry operation or has adequate experience in the field.
- He reports to one of the associate or assistant administrators. Many laundry managers come up through the ranks.
- However, with increased automation and better opportunities to train people in technical schools, more and more hospitals are recruiting ITI-trained personnel to head their in-house laundries.
- No formal training is required for the other personnel and most of them learn their responsibilities on the job.
- Hospitals will do well to recruit personnel who are able to read and understand simple instructions.

5.7 Facilities and Space Requirements

1. Reception control area with facilities for receiving, storing, sorting and washer loading of soiled linen.
2. Sluicing and disinfecting/decontaminating area.
3. Clean linen processing room.
4. Laundry manager's office with provision for an unobstructed view of the laundry operation.
5. Sewing, inspection and mending area. A light table is necessary for inspection.
6. Staff facilities.
7. Supply storage room.
8. A lockable store to accommodate materials for re-clothing calendars and presses.
9. Solution preparation and storage room.
10. Hand washing facilities in each room where clean and soiled linen is handled or processed.
11. Provision for supply of water, power, steam and compressed air.
12. Cart washing and cart storage area.
13. Clean linen storage room.
14. Clean linen issuing counter.

15. Electrical distribution switchgear room.

16. Water recovery and recycling plant, if necessary.

17. Water softening plant, if necessary. The

following facilities are required off-site:

1. A central clean linen storage and issuing room.
2. Clean linen (lockable) storage in every nursing unit and user department.
3. Separate room(s) to receive and hold soiled linen from the wards and departments until ready for pick up by the laundry personnel.

5.8 Selection of Equipment

- Automatic machine and labour saving devices have resulted in economics in the number of personnel and operational time, increased productivity, better utilization of water, heat power, steam and washing materials, and maximum utilization of men and machines.
- Some of the features commonly focused are automatic formula dispensers, automatic operation controls, sorting and counting devices, machines combining washing, rinsing and extraction, and flat work folding machines for automatic folding.
- The solution of equipment of a proper size is of utmost importance for balanced and economical production.
- Laundry equipments should be carefully selected. The following factors should be kept in mind:

1. Reasonable capital cost.
2. Reliability of design and compliance with the Bureau of Indian Standards.
3. Availability of spare parts and ease of maintenance.
4. Efficiency in working under normal conditions.
5. Economy in consumption of utilities like water, power, steam, etc. and in washing materials and other consumables.
6. Continuity of workflow and reduction of manual effort.

5.8.1 List of Equipment

1. Washer-extractor sluicing machine.
2. Double-door washing machine.
3. Hydro-extractor.
4. Machines combining washing, rinsing and extraction.
5. Flat work ironer, also called rotary iron or calendar.
6. Tumble dryer.
7. Utility press.
8. Mushroom press.
9. Table trolley.
10. Hand iron.
11. Dry linen trolley.
12. Wet linen trolley.
13. Linen hamper.
14. Hanger trolley.