Hospital Pharmacy

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I. Introduction

1.1 Pharmacy and pharmacy careers

- **Pharmacy:** is the **responsible profession for appropriate use of medication**, and **to achieve optimum therapeutic outcomes**
  - Cure of a disease
  - Elimination or reduction of a patient's symptoms
  - Arresting or slowing of a disease process
  - Preventing a disease

- **Pharmacists:** are **highly-trained and skilled healthcare professionals** who perform various roles to ensure optimal health outcomes for their patients

- **Pharmacists deliver pharmaceutical services in a variety of settings**
  - Research institutions
  - Academic areas
  - Industries

- Regulatory body
- MOH and its branches
- Health institutions
- Community pharmacy
- Importer and wholesalers
- NGOs

- The ultimate goal of pharmacists is **to achieve optimum therapeutic outcome** at individual patient level.

1.2 Hospital pharmacy

Hospital Pharmacy

- Concerned with pharmacy service to all types of hospital

  DSM, pharmaceutical care, dispensing, compounding/manufacturing, teaching, research, etc.

Clinical pharmacy

- Deals with **patient-centered** pharmaceutical service:
  - In a hospital setting (OP, IP)
  - In community pharmacy
  - In patient's home

Historical development of hospital pharmacy

- The separation of pharmacy from Medicine took place in charitable health institutions operated under government

- **The division of labor took place in order to improve the quality of care.**

- **Apothecaries** – practice pharmacy
- **Physicians**-practice medicine

- Recognition of pharmacy as a separate profession (9th C).
- Since the division first occurred in hospitals, **hospital pharmacist is the first recognized practitioner of the profession of pharmacy.**
- The first hospital pharmacy was established by Jonathan Roberts in Pennsylvania hospital (Philadelphia) in1752

Factors contributed to the growth of hospital pharmacy

- **Pharmacological advances** led to more powerful medications **that required the pharmacist's expertise for control, distribution, and monitoring of use**.
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Objectives of a hospital pharmacy

1. To do pharmaceutical services in a professional way.
2. To ensure the availability of the right medication at the right time, in the right dose and at the minimum possible cost.
3. To serve as counseling department to patients and health professionals.

4. To act as a data bank on drugs utilization and pharmacokinetic aspects.
5. To manufacture drugs which are not available from outside source.
6. To implement decisions of DTC

Major abilities required from the pharmacist

- **General abilities**:
  - Materials management and inventory control.
  - Cost reduction
  - Storage and storing in various conditions.
  - Administration- planning and accounting
  - Knowledge about all related laws and legal regulations
  - statistics

- **Technical abilities on:**
  - Manufacturing techniques.
  - Testing knowledge, handling of instruments
  - Dispensing methods
  - Incompatibilities
  - Pharmacokinetics
  - Sustained action therapy
  - Intravenous drug admixtures
  - Research and development

II. Hospital and Its Organization

- **Hospital** is an institution which pools together all the health professionals, the diagnostic and therapeutic facilities and the physical facilities into a coordinated system for delivering health care to the public.

- Many hospitals also serve as centers for innovative research and medical technology.

2.1 Historical development of hospitals

- The term *hospital* derives from the Latin word ***hospitalis***, which relates to guests and their treatment.
- In older days, hospitals were not merely places for healing but were havens for the poor or for tired travelers.
- Hospitals has their origin in India and Egyptian culture during the 6th century B.C

Factors that contributed to the development expansion of hospitals

- Sociological development of individuals
- Religious influence
- Military influence
  - These lead to the development of formal medical education and public interest for hospital care.

- The first hospital established in the United States was Pennsylvania Hospital in Philadelphia, which was chartered in 1751 .
- Beyond the three basic essentials of human existene, the hospial has become a nesessary instrument for providing a 4th basic element for survival, *Health*.

2.2. Classification of Hospitals

- Hospitals can be classified in different ways

1) **Based on type of service**

a) ***General hospitals:*** provide general care to patients with any type of illness (medical, surgical, pediatric, psychiatric, maternity,.. .)

b) ***Specialized Hospitals:*** restrict the care they provide to special conditions (Cancer, psychiatric, pediatric, or maternity)

c) ***General Specialized hospitals:*** provide specialized care to many types of patients

2) Based on length of stay

a) ***Short-term hospital:*** the average length of stay of the patient is less than 30 days.

General hospitals are short-term hospitals

b) ***Long-term hospital:*** the average length of stay of the patient is 30 days or longer.

Specialized hospitals are long-term hospitals

3) Based on ownership

a) Government hospitals

b) Nongovernmental hospitals

i. Non-profit (Missionary hospitals)

ii. For profit

4) Based on bed capacity

Type of hospital	Number of beds
Small hospital	<100
Medium hospital	100-199
Big hospital	200-500
Very big hospital	>500

2.3. Functions of Hospitals

- Traditionally, the hospital's basic purpose for existence has been the treatment and care of sick and injured
- In conjunction with this basic function, hospitals has been concerned with other functions
- **The four fundamental functions of hospitals are**:
  - Patient care
  - Teaching/education
  - Research
  - Public health (preventive medicine)

I. Patient care

- Patient care is the basic purpose for the very existence of hospitals
- Involves **Dx, treatment of illnesses or injury and alleviation of pain and suffering**
- It includes emergency, OP and IP cares
- The other three functions exist because they contribute either directly or indirectly to patient care

Role of the pharmacist in patient care:

- Availing pharmaceuticals of the required quality and quantity
- Good dispensing practice
- Promoting GPP(Good Pharmacy Practice)
- Patient education
- Provision of drug information
- Pharmaceutical care (very important part of patient care)

2. Education

- Education is and important function of the modern hospital.
- Education as a hospital function has 2 major forms

i. ***Education of the health professionals and allied health professionals***

Health professionals:

physicians, nurses, pharmacists, laboratory technologists,

Allied health professionals:

- Medical social service workers
- Medical record librarians
- Dietarians

- **Educational programs**
  - Formal programs (Medical, nursing, pharmacy, laboratory..)
  - In-service trainings
  - On-job training (mainly for allied staff)

ii) *Education of the patient*

- Important hospital function
- **Less recognized by the public and professionals**
- Increase awareness of the patient (community) in the prevention and treatment of diseases
- **Increase community participation in disease prevention and treatment**
- Means of delivery: audio, audiovisual, posters, leaflets, face-to-face teaching

Role of pharmacists?

3. Research

- Hospitals carry out research activities to deliver better health care for the patient.
- Research activities in a hospital
- Devising new diagnostic procedures
- Developing new surgical procedures
- Evaluating investigational drugs
- Research to improve administrative procedures

- **Studies on customer satisfaction**
- Biopharmaceutical pharmacokinetic studies
- Drug supply management studies
- Designing and developing new medical equipments to improve patient care
- Pharmacoepdimological studies

Role of pharmacists?

4. Preventive medicine (public health)

- Relatively new hospital function
- Is assisting the community in **reducing the incidence of sickness and injury**.
- Increase the general health of the population
- **Decreased hospital patient burden**
- Increase quality of patient care

How?

- Teaching on routine hygienic practices
- Immunization
- Emergency campaigns
- Physical exercise
- Nutrition (feeding habit)
- Environmental sanitation
- Safe drug use
- Poison prevention measures

Role of pharmacist in public health services?

2.4 Organization and Administration of a hospital

- **Levels allow efficient management** of hospital departments.
- The structure helps one understand the hospital's **chain of command**.
- ***Organizational Structure*** refers to levels of management within a hospital.
- Large hospitals have complex organizational structures.

- Smaller hospitals tend to have much simpler organizational structures.
- Organizational structure varies from hospital to hospital.
- **Hospital departments are grouped in order to promote efficiency of facility.**
- Grouping is generally done according to similarity of duties.

Governing body/Board

- **In regional, zonal and city hospitals,** the governing body/board is usually from the **political subdivision** in which the hospital is located
- In the non-profit, nongovernmental hospitals, there is usually a governing board
- **The governing body/board assumes overall responsibility** for the proper operation of the sick and injured at affordable cost

- The governing body, acting on recommendations of the chief administrative office, must:
  - Select competent personnel
  - Control the hospital fund
  - Establish the working hours, salary schedules, proper checks on personnel

- Devise methods for obtaining income for the hospital
- Establish adequate accounting system and routine auditing system of the accounts
- Determine the needs for additional or replacement construction of the physical plant of the hospital

- **The governing body has its own organization, comprised of:**
  - A chairman
  - v/chairman
  - Secretary
  - On many boards the CEO of the hospital serves as secretary of the board.

Director/Chief Executive Officer (CEO)

- Appointed by the governing board
- Is secretary of the governing board
- **Produce a two-way channel of communication b/n the board and the hospital staff**.
  - Reports the governing board all essential facts concerning the operation of the hospital
  - Receives from the board all policies and directives issued and implements them

- **The director/CEO forms the following committees and chairs most of them:**
  - **Management committee**
  - **Drug and Therapeutics committee** (DTC)
  - Training and upgrading committee
  - **Tender committee**
  - Maintenance committee
  - Ethical committee

2.5 Departments

- Hospitals are typically organized into medical departments
- **The common clinical departments are:**

Medical
Surgical
ENT
Pediatrics
Ophthalmology
Pharmacy
Obstetrics & Gynecology
nursing
radiology
Dentistry
Psychiatry
Physiotherapy. . .

**Clinical departments can have sub-specialty units*

Department Heads:

- **Competent expert staff** are assigned as heads of departments
- Have the responsibility to operate the departments effectively and properly towards the mission and vision of the hospital within the overall policies and philosophies of the hospital

Specific functions of heads:

- Prepares annual action plan of their department
- Maintain the quality of service of the department
- Cooperate with other departments
- Send regular report regarding the activities of the department to the director
- Participate effectively in the various hospital committees to which he/she has been appointed as a member

2.6 Hospital staff

- ***Medical staff:*** responsible for providing all clinical services to patients
- ***Administrative staff/Supportive staff:*** support the medical staff by availing all necessary resource for clinical service

Medical staff comprises of:

- *Active medical staff:* involved in regular patient care
- *Consulting medical staff*
- *Honorary medical staff: physicians who have* been active in the hospital but who are retired
- *Resident* medical staff: provide specific patient care services from which they receive education and experience

2.7 Financing Hospital Care

- The technological development and the rapid advances of the medical sciences annually increase the financial burdens of hospitals
- In order to provide the best care available hospitals must keep up with these advances by obtaining the newest diagnostic and therapeutics equipments, facilities and products
- Labor cost has also increased

Sources of income for hospitals:

- Government budget
- Patients (Paying)
- Third-party hospitalization insurance
- Donation (Voluntary contribution)
- Investment (income generating units)
  - Drug manufacturing/compounding
  - Special pharmacy
  - Special laboratory
  - Supermarket
  - cafeteria

III. Hospital Pharmacy and Its Organization

- **Hospital pharmacy** is that division of the hospital in which all hospital **pharmaceutical services are delivered by qualified, competent professionals**.
  - Selection/quantification
  - Procurement
  - Storage
  - Distribution
  - Compounding/manufacturing

- Promotion of rational prescribing
- Dispensing
- Provision of drug information
- Pharmaceutical care
- TDM
- Research
- Education/training
- Public health services

3.1 Location and layout of hospital pharmacy

- **The pharmacy should be located in the ground floor, easily accessible to all departments**.
- Branch of the pharmacy may be established in or near the OP block.
- OP pharmacy should have enough place for waiting pts and suitable seating arrangement shall be provided.
- Preparation of stock mixtures and dispensing areas should be adjacent

Considerations in designing the pharmacy:

1) The pharmacy must be located, so that it is
   - -accessible to the OP department
   - -convenient for dispensing and
2) Traffic within the department must be economical and flexible.
3) Its size is determined by its organization and operational policies.

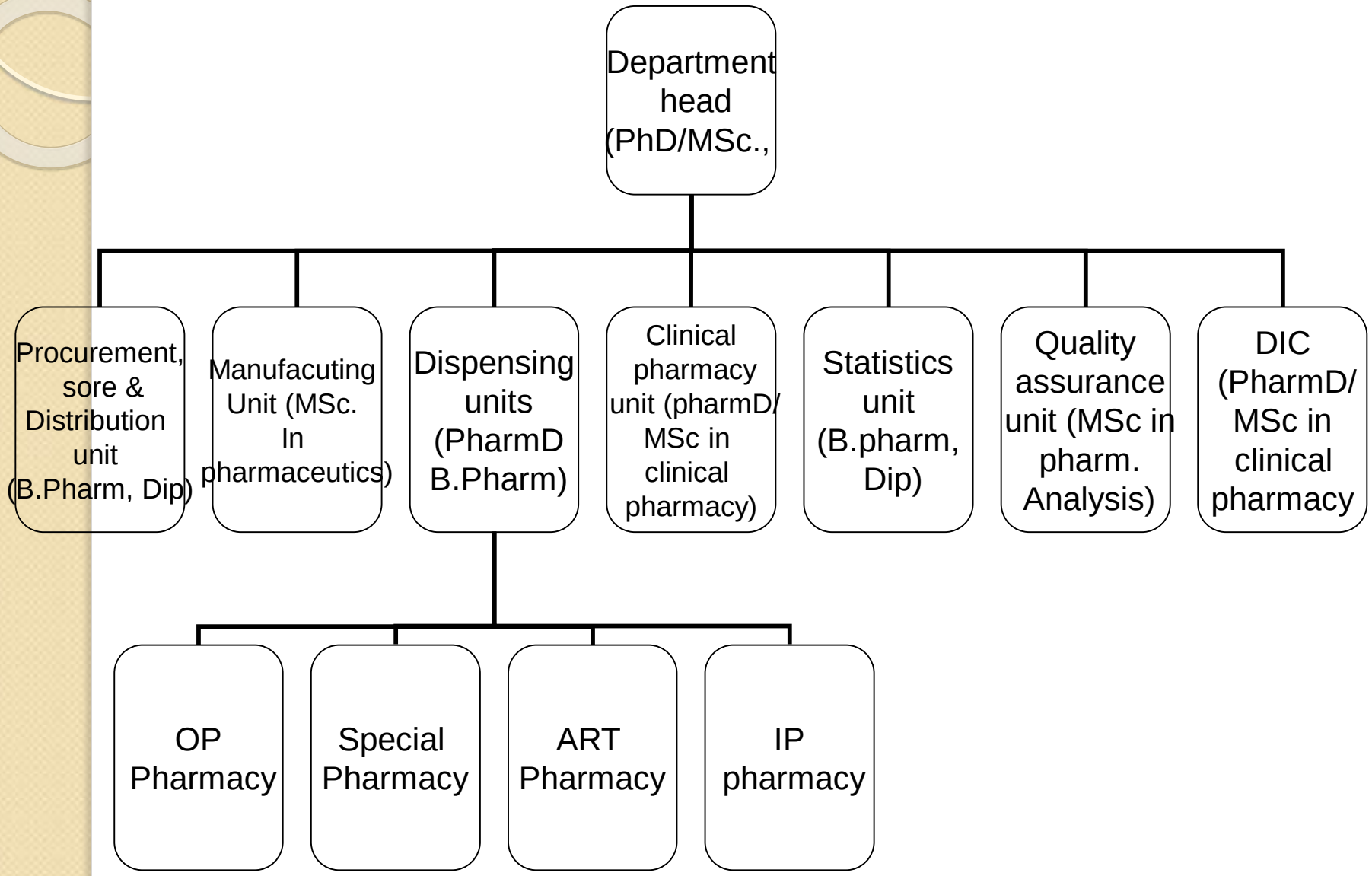
4) Provision for security of dangerous drugs and narcotic drugs must be ensured.
5) Provision for control of fire must be ensured, as many inflammable substances are stored there
6) The corridors must allow easy turning of wheeled vehicles.

3.2 Minimum standard for Hospital pharmacy

- The first minimum standard for hospital pharmacy was set in 1953
- To meet at least a respectable basic quality of performance, a hospital pharmacy should fulfill the following **minimum standards**:
- **1-Organization**
- **2-Policies**
- **3-Personnel**

- 4-Facilities
- 5-Proper efficiency to discharge most of the responsibilities of the hospital pharmacy
- 6-DTC

I-Organization



Pharmacy case teams

- Based on the recommendations of the DTC, pharmacy service will be run by the following teams.
  - Drug purchasing, Distribution and Storage case team
  - Outpatient pharmacy case team
  - Inpatient pharmacy case team
  - ART case team

Drug purchasing, distribution and storage case team

- Maintain adequate stock of essential drugs
- Purchase drugs
- Distribute drugs to dispensing units and wards upon request
- Store drugs appropriately
- Discard expired/damaged drugs
- Disseminate stock information
- Undertake regular physical inventory of drugs

Outpatient pharmacy case team

- Maintaining adequate stock of essential drugs for ambulatory patients
- Compounding of dermatological preparations
- Checking appropriateness of drug orders
- Packing, labeling and providing drugs to ambulatory pts

- Counseling pts on drug use
- Monitoring drug therapy of ambulatory pts
- Maintain record of drug profile of pts
- Provide drug information

Inpatient pharmacy case team

- Maintain adequate stock of essential drugs for hospitalized patients
- Pack, label and provide drugs
- Maintain record of drug profile of patients
- Advise physicians on drug selection and dosage
- Advice nurses on IV admixture preparation and drug administration
- Provide DI to pts and health professionals
- Check appropriateness of medication order
- Monitor drug therapy of pts

ART case team

- Maintain adequate stock of ARVs.
- Maintain record of drug profile of ART pts and report
- Counseling the pts on drug use.
- Provide drug information.

2- Policies

i) Administrative policy

- If a **prescription comes from another source**, the question of dispensing this prescription
- **Dispensing of drugs to any staff of the hospital freely** or **with partial/full payment**
- Dispensing of drugs to patients (free/payment/credit
- Whether a non-pharmacy professional health professional staff should dispense, handle drugs. . .

ii) Professional policy

- Final checking of dispensed drugs by a pharmacist
- Handling and dispensing of opioids,
- Registration and filing of prescriptions . .

3- Personnel

- Professional staff
  - Pharmacists
  - Druggists
  - Junior druggists
- Nonprofessional staff
  - **Secretaries**
  - **Clerks**
  - **cleaners**

4- Facilities

i) All necessary equipments and rooms to perform planned professional functions

- Manufacturing
- Dispensing
- Storage
- Record-keeping
- DIC
- Clinical pharmacy service

ii) Stationery materials, recording books, models, stock control cards

iii) Technical library

Pharmacy department shall has access to the references.

- UP-to-date pharmacopoeias
- Martindel the extra pharmacopoeia
- DL, formularies, STG
- Journals
- Internet. . .

5- Adequate efficiency to discharge the responsibilities assigned to the hospital pharmacy department

- **Duties and responsibilities of a Hospital pharmacy division**

1. Manufacturing of drugs
   - Income generation
   - Increase availability at lower cost
2. Dispensing and compounding
3. Planned procurement of drugs
4. Stock management

Duties and responsibilities.....

5. Maintain adequate amount of essential drugs and supplies, especially emergency drugs and supplies
6. Control the quality of drugs (procurement, storage, dispensing)
7. Programmed drug distribution
8. Provision of drug information

10. Providing clinical pharmacy service
11. Planning and organizing the department
12. Maintaining existing pharmacy policies and proposing new ones
13. Participate in teaching and research
14. Maintain the facilities of the department
15. Implement the decisions of the DTC of the hospital
16. Record-keeping and reporting of activities

IV. Drug and Therapeutics Committee and Formulary system

4.1 Drug and therapeutics committee (DTC)

- Means a group of health professional that advice **on matters related to drug management**
- Represents the official organizational line of **communication and liaison b/n the medical & pharmacy staffs.**
- Assists in the **formulation of broad professional policies relating to drugs in institutions**, including **their evaluation, selection, procurement, storage, distribution and safe use**

Objectives of DTC

- To improve the long standing **poor drug supply management** and **irrational use of drugs.**
- To foster teamwork sprit among health professionals

Organization of DTC

- DTC shall be established at regional, zonal/woreda and health institution levels.
- **DTC established at hospital level shall have the following members:**
- **Medical director – Chair person**
- **Head of the pharmacy section – Secretary**
- **Head of the nursing section – member**
- **Heads of no less than 4 departments- member**
- **Head of administration & finance section** – Exofficio member

Functions of DTC

- Prepare guidelines for the selection, quantification, procurement, storage, distribution and stock control of pharmaceuticals in the hospital.
- Prepare and maintain DL, formulary & STG
- Involve in the clinical evaluation of investigational drugs
- Organize continuing education for the medical staff on drugs and their use

- **Establish ADR reporting & monitoring system**
- Advises the pharmacy department in the storage, distribution and control of pharmaceuticals
- **Advice the medical staff on issues related with drugs.**

4.2 Formulary services

Formulary system:

- Is a method by **which the medical staff of an institution, working through the DTC**, **evaluates** and **selects** from among the numerous available drugs those **that are considered most useful in patient care.**
- Is an important tool for assuring the quality of drug use and controlling its cost.

- Encompasses **drug selection, drug utilization review**, and other tools **to promote best practice** in **prescribing, dispensing, administration of drugs** and monitoring of outcomes.

To be effective, the formulary system must have;

- The approval of the organized medical staff
- The agreement of individual staff members
- Properly organized, functioning DTC of the medical staff

Benefits of an effective formulary system

A) Approved and efficacious drugs that all practitioners will have available for use

- Only the most effective and safe products
- Drugs that have been evaluated systematically
- Drugs that are chosen and approved to treat the diseases of the region or country
- Physicians develop greater experience with fewer drugs

B) Drug therapy at lower cost

- Ineffective, high-cost drugs will not be available
- Availability of most effective drugs leads to improved outcomes and lower cost
- Reduced inventory cost

c) Consistent supply of drugs

- Regulating the number of drugs will improve procurement and inventory management
- Essential drugs will be available from many sources at competitive price

Formulary system management:

- Is the application of various techniques to ensure high quality and cost-effective drug therapy through the formulary system.
- **Ensures the availability** of the following agreed upon, up-to-date, basic hospital documents.
  - Drug list
  - Formulary
  - STG

Guiding principles in formulary system management:

- The medical staff should appoint a multidisciplinary DTC.
- The formulary system should be supported by the medical staff based on the recommendations of the DTC.
- The medical staff should adopt written policies and procedures governing the formulary system as developed by the DTC.

- **Drugs should be included in the formulary by their non-proprietary names.**
- Limit drug procurement to formulary drugs sand ensure availability of formulary drugs
- The formulary system should be introduced to the medical staff

Formulary management principles:

- Select drugs on the basis of need (**diseases and conditions that have been identified locally**)
- Select **DOC**
- Maintain a limited number of drugs
- Use generic names
- Use combination products only in specific proven conditions

- **Selection criteria must be explicit and include:**
  - **Efficacy**
  - **Safety**
  - **Quality**
  - **Cost**
- Make sure that drugs are consistent with national and regional formularies and STG

Formulary

- Is a **list of drugs with associated information about each drug** that are considered by the professional staff in health setting to be the most useful for patient care.

The primary objectives of formulary:

- Information on the drugs approved for use
- Basic therapeutic information about each drug
- Information on organizational policies and procedures governing drugs and their use
- Special information about drugs

- In accordance with these objectives, the formulary should consist of three main parts

1. information on organizational policies and procedures
2. Drug product list with summarized information
3. Special information

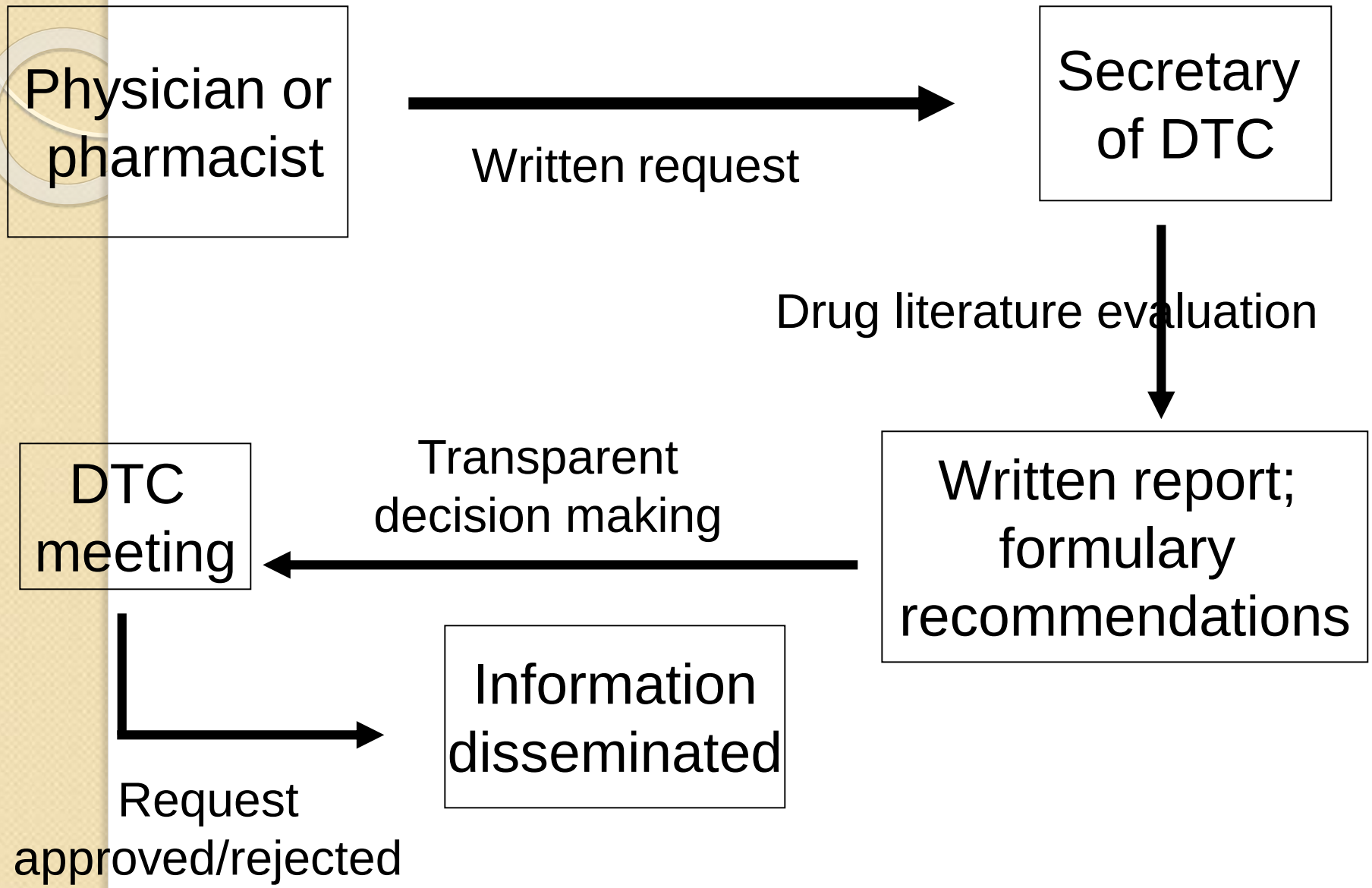
- List of formulary drugs are placed - alphabetically and/or therapeutic category
- The drug information section includes:
  - Generic name
  - DF(s) and strength(s)
  - Indications, contraindications, precautions, side effects
  - Dosage schedule
  - Drug interactions

- **Supplementary information for drugs includes:**
  - Price regulatory category
  - Storage guidelines
  - Patient counseling information
  - Labeling information
  - Brand names and synonyms
  - Other relevant drug information

Maintaining a formulary:

- Evaluate new drug requests and deletions
- Systematic review of therapeutic groups/classes on regular basis

- **Steps to add or delete a new drug**



- **Steps to evaluate a drug:**
  - Compile information resources
  - Perform evaluation using established criteria
  - Obtain expert opinion and recommendations
  - Write drug monograph describing the evaluation and results
  - Develop recommendations to present to the DTC

Criteria for evaluating and selecting drugs for the formulary:

- Disease patterns
- Efficacy
- Safety
- Quality
- Cost
- Well known drugs
- Health system personnel, expertise and equipments available to manage the drug
- Financial resources available to buy the drug

Information resources

- **Primary literature**
  - British medical journal
  - New England journal of medicine
  - Journal of the American medical association
- **Secondary literature**
  - Medical letter, newsletters or bulletins
  - Peer review journals
  - Electronic databases

- **Tertiary literature**
  - Martindale: The extra pharmacopoeia
  - British national formulary
  - USP drug information
  - American hospital formulary service (AHFS) drug information

Standard treatment guidelines (STGs)

- STG - a systematically developed, **disease-focused document designed to assist practitioners** in making decisions about appropriate health care for specific clinical circumstances.
- **Treatment of diseases may have many different approaches**
- Many practitioners will not remember the best method of treatment

- Applying the most effective treatment, benefits both the patient and the health care system
- Formulary management will have only limited impact if the drugs are used incorrectly

Advantages of STG

For practitioners:

- Provides **standardized guidance** to practitioners
- **Promotes high quality of care by directing practitioners to the most appropriate drugs for specific conditions**
- Provides best quality of care since patients are receiving optimal therapy

- Utilizes only formulary or essential drugs, so the healthcare system need provide only those drugs in the guidelines
- Enables providers to concentrate on making the correct diagnosis
- Provides a basis for evaluating quality of care provided by health care professionals
- Provides a system for controlling costs
- Provides information to patients concerning the institution's standards of care

For supply management:

- Utilizes only formulary drugs or essential drugs; therefore the health system need only provide drugs in the guideline
- Provides reliable information for forecasting and ordering
- Better availability of needed drugs

For patients:

- Patients receive optimal drug therapy
- Enables consistent and predictable treatment from all levels of providers and at all locations
- Allows for improved availability of drugs because of consistent and known usage patterns
- Helps provide good outcomes because patients are receiving the best treatment regimen available
- Lower cost

Establishing STG

- Establish STG committee
- Develop comprehensive plan for development
- Identify diseases that the STG will cover
- Determine appropriate treatments options
- Determine what information should be included in the STG
- Draft the STG for comments and pilot testing
- Publication and dissemination
- Revisions and updates

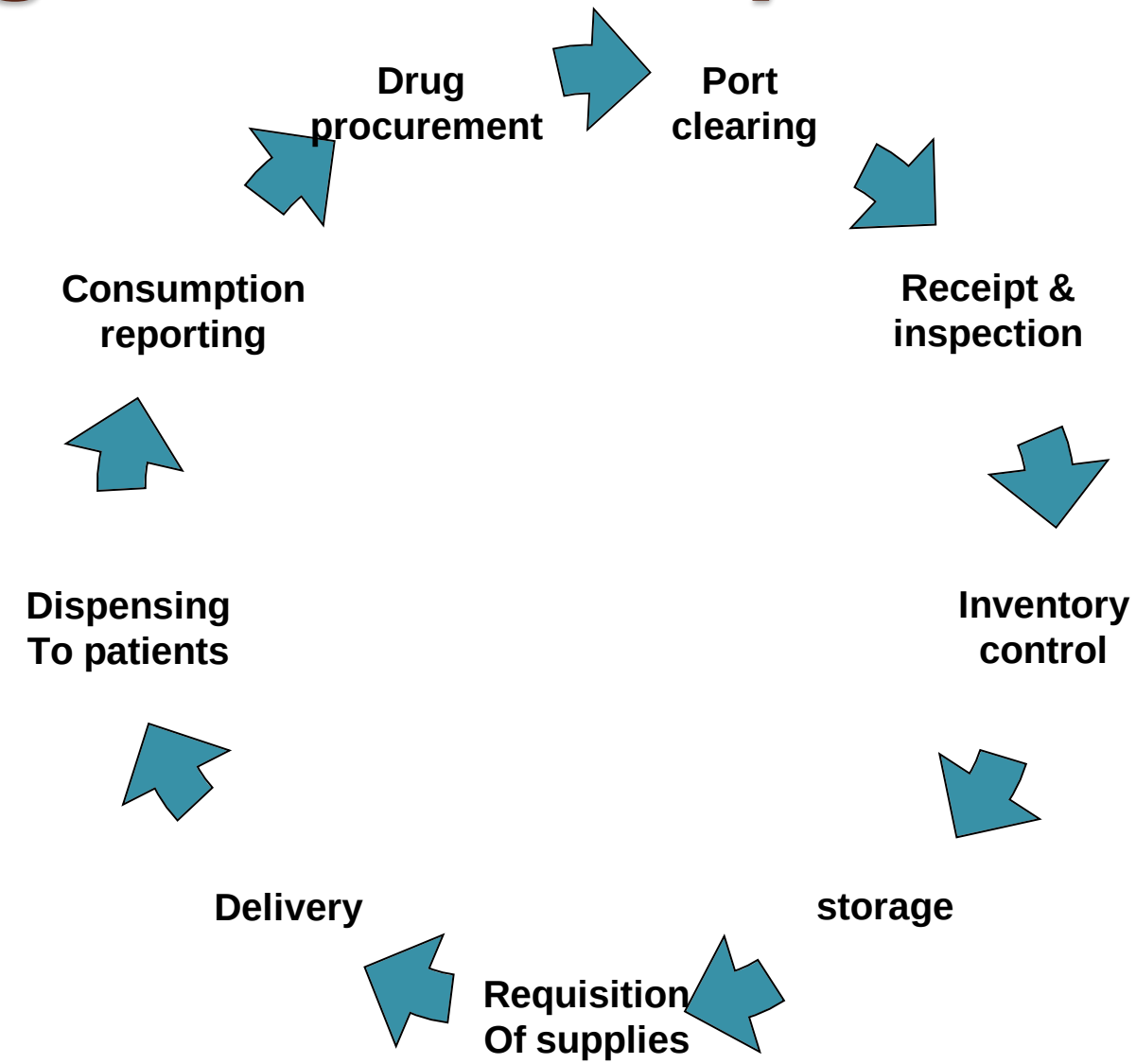
Key features of STG

- Simplicity
- Credibility
- Same standards for all levels
- Drug supply based on standards
- Use in training students
- Regular updates
- Provided in a durable pocket manual

V. Drug distribution system in hospitals

- **Drug distribution:** is a continuous process of receiving drugs from the supplier and moving them safely/securely to the many points in health care system at which the drugs will be dispensed to patients.

Drug distribution cycle



Requisition of supplies

- **Pull-system:** each level of the system determines what types and quantities of drugs are needed and places orders with the supply source.

- **Push-system:** supply sources at some level in the system determines what types and quantities of drugs will be delivered to lower levels.

5.1 Distributions to outpatients

- The OP services provide the main linkage of the hospital with the community.

- An outpatient is one who after consultation and Dx, receives treatment without being admitted

- Medicines are give to the OPs on the prescriptions.
- There shall be benches provided for the patients to sit during waiting period.
- Posters on health education and community health programs may be displayed in this waiting area.

5.2 Distribution to inpatients

- Inpatients are admitted patients in hospital, stay there for treatment till they are discharged

- The pharmacist's service to IPs will vary depending upon the departments.

- **In radiology department:**
  - Medicines required for Dx purposes.
- **In operation theatre:**
  - Anesthetic liquid/inj.,
  - infusion solutions,
  - surgical gauges &cotton,
  - antiseptic solutions, and some injectable
- **In wards:**
  - apart from medicines, catheter, cotton lint and bandages, etc are called medical supplies

5.3 Types of drug distribution

A) Floor or ward stock system:

- In this system, all but the most unusual drug items are stocked on the nursing stations.

- Drug products which require **special control** (e.g., **antineoplastic agents**) **are often omitted from floor stock**, and are sent to the nursing unit **upon receipt of a prescription order** for the individual patient.

- All containers used for floor stock must meet specific labeling requirements as addressed in these rules.

B) **Individual prescription order system:**

- In this system, all medications are dispensed by the pharmacist on individual prescription orders.

C) **Combination of floor stock and the individual prescription order system:**

- In this system, most drugs are dispensed on an individual prescription basis.
- The remaining drugs are obtained via limited floor stock.

D) Unit dose dispensing system:

- In this system, medications are contained in single unit packages;
- **they are dispensed in as ready-to-administer form as possible, for most medications.**
- All doses will be labeled properly to include name, strength, expiration date, or lot number or control number, or both.

VI. Other vital hospital services

6.1 Pharmaceutical care (PC)

- Ground-breaking concept in the practice of pharmacy
- Emerged in the 1970s
- The responsible provision of drug therapy for the purpose of achieving definite outcomes that improve or maintain a patient's quality of life
- A patient-centered pharmaceutical service
- New mission of the pharmacy ;profession
- Component of the health care services

Why PC?

- Medicine-related problems cause harm and discomfort to patients and society
- Different attempts have been made by professionals to avoid medicine-related problems
- PC is one professional strategy dealing with detection and assessment of medicine-related problems in a systematic way.
- Pharmacists are in an excellent position to resolve drug therapy problems

- Pharmacists' involvement in patient-centered care has been associated with:
  - Improved health and economic outcomes
  - Reduction in drug-related adverse events
  - Improved quality of life and
  - Reduced morbidity and mortality

Steps in the delivery of PC

1. Data collection
2. Evaluation of information
3. Formulating a plan
4. Implementing the plan
5. Monitoring and modifying the plan to ensure +ve outcomes
6. Follow- up

Barriers to PC

- Individual pharmacist characteristics
- Practice-setting constraints
- Interprofessional barriers
- System impediments

6.2 Prepackaging services

- **Prepackaging** is the packaging of medication using either manual labor or automated dispensing systems, where larger quantities of existing inventories from a manufacturer's original commercial container or quantities of unit dosed drugs are repackaged into smaller quantities consistent with dosing regimens commonly prescribed by authorized health care professionals

Advantage of prepacking

- ***Improved case management*** - doses given according to weight.
- ***Improved compliance*** - easy to understand and easy to remember instructions; more effective counseling.
- ***Reduced waiting times*** in dispensaries.
- ***Sustainability*** - cheap, readily available materials.
- ***Acceptability*** - to both staff and patients

6.3 Drug information service

- Drug information (DI): is the provision of unbiased, well-referenced, and critically evaluated information on drug related issues.

Functions of DI service:

1. Responding to DI questions
2. DTC and formulary support
3. Drug utilization review

4. ADR reporting

5. Patient counseling

6. Continuing education programs

7. Investigational drug studies

8. Research

9. Drug information education

Major users of DI services

- Health care providers
- Patients and/or the general public
- Students
- News agency and lawyers

Steps in delivering DI services

1. Obtaining the necessary background information
2. Interpreting and classifying the drug information request
3. Systematically conducting a literature search
4. Evaluating the literature in an accurate and unbiased manner

4. Formulating a relevant, coherent and informative response
5. Communicating the response in a verbal and/or written form
6. Follow-up

6.4 Manufacturing services:

- The hospital pharmacy in large and advanced institutions has evolved from a simple storage and distribution unit into a highly specialized manipulation and dispensation center, responsible for the handling of hundreds of clinical requests, **many of them unique and not obtainable from commercial companies**.

- It was therefore quite natural that in many environments, a manufacturing service was gradually established, to cater to both conventional and extraordinary demands of the medical staff.

The need for manufacturing services in hospitals

1. Private companies do not supply certain drugs
2. private manufacturers do not supply certain medicines due to short life period
3. Cost factor
4. Assurance of supply
5. To some extent, unfair practices of outsiders makes the hospitals opt for making, rather than buying

Types of manufactured drugs:

- drugs similar to commercially distributed products,
- exclusive formulations for routine consumption, and
- special demands related to clinical investigations.

Control of manufacturing services:

- The modern hospital pharmacy engages in drug packaging and compounding in much **the same way that pharmaceutical manufacturers do.**
- But, **the FDA has chosen to exempt hospital pharmacies from the close regulation to which drug manufacturers are subjected.**

- According to FDA, **registration is not required by the hospital pharmacy that compounds medication for**:
  - IP dispensing, OP dispensing (sale or free),
  - mailing to a patient within the region or out of the region,
  - or for transferal to another unit of the same hospital (within the region or in another region) for dispensing by that unit of hospital.

- However, if the hospital pharmacy compounds medication which it sells to another hospital or a drugstore, such sale is not at "retail" and registration is required.

THANK YOU!