Medication Dispensing and Distribution System

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Outline

- **Medication dispensing and distribution system:**

✓ **Dispensing to inpatients.**

✓ **Distribution of control substance.**

HOSPITAL DRUG DISTRIBUTION SYSTEM

- Traditional methods of distributing drugs in hospitals are now undergoing re-evaluation.

- Newer concepts in connection with hospital drug distribution systems are:

  - centralized or decentralized (single, or unit-dose) dispending.

  - automated (mechanical and/or electronic) processing of medication orders and inventory control.

  - automated (mechanical and/or electronic) storage and delivery devices.

HOSPITAL DRUG DISTRIBUTION SYSTEM

Traditional methods of distributing drugs in hospitals are now undergoing reevaluation, and considerable thought and activity is being directed toward the development of new and improved drug distribution systems. Some of the newer concepts and ideas in connection with hospital drug distribution systems are centralized or decentralized (single, or unit-dose) dispending, automated (mechanical and/or electronic) processing of medication orders and inventory control, and automated (mechanical and/or electronic) storage and delivery devices. Several investigators are at work in each of these areas, and the results of their studies may greatly alter current practices and procedures.

Because of the present state of uncertainty regarding the proper scope and optimum design of drug distribution systems for the modern hospital, and as an aid to pharmacists, nurses, physicians, and administrators who are faced with making decisions concerning drug distribution systems during this period of change, the following guidelines for evaluating proposed changes or new ideas or equipments are presented.

Though some of the practices recommended may not be widespread at the present, the adoption of these practices is believed to be a desirable and practical goal. Therefore, it is urged that they be given prime consideration in the design of new drug distribution systems and in modifications of existing ones (particularly where such changes would commit a hospital to a considerable financial investment in a system not including, or not easily altered to include, the recommended practices).

1. Before the initial dose of medication is administered the pharmacist should review the prescriber's original order or a direct copy.

2. Drugs dispensed should be as ready for administration to the patient as the current status of pharmaceutical technology will permit, and must bear adequate identification including (but not limited to); name or names of drug, strength or potency, routes(s) of administration, expiration date, control number, and such other special instructions as may be indicated.
3. Facilities and equipment used to store drugs should be so designed that the drugs are accessible only to medical practitioners authorized to prescribe, to pharmacists authorized to dispense, or to nurses authorized to administer such drugs.
4. Facilities and equipment used to store drugs should be designed to facilitate routine inspection of the drug prior to the time of administration.
5. When utilizing automated (mechanical and/or electronic) devices as pharmaceutical tools, it is mandatory that provision be made to provide suitable pharmaceutical services in the event of failure of the device.
6. Such mechanical or electronic drug storage and dispensing devices, as require or encourage the repackaging of drug dosage forms from the manufacturer's original container, should permit and facilitate the use of new package, which will assure the stability of each drug and meet the standards for the packaging and storing of drugs, in addition to meeting all other standards of good pharmacy practice.
7. In considering automated (mechanical and/or electronic) devices as pharmaceutical tools, the distinction between the accuracy required in accounting practices versus that required in dispensing practices should be clearly distinguished.

Drug Distribution systems or Dispensing to In-Patients

There are four systems in general use for dispensing drugs for inpatients:

(i) Individual Prescription Order System.

(ii) Complete Floor Stock System.

(iii) Combination of (i) and (ii).

(iv) The unit dose method.

Individual prescription order system

- This system is generally used by the small and/or private hospital because of the reduced manpower requirement and the desirability for individualized service.

- Advantages of this system:

(i) All medication orders are directly reviewed by the pharmacist.

(ii) Provides for the interaction of pharmacist, doctor, nurse and patient.

(iii) Provides closer control of inventory.

Complete floor stock system

- This system is used most often in governmental hospitals.
- Under this system, the drugs are given to the patient through the nursing station and the pharmacy supplies from the drug store of a hospital.
- According to this condition the nurses store the drug and administer them to the patient according to the physician's order.
- The drugs which are rarely used, or expensive drugs are omitted from floor stock but are dispensed upon the receipt of a prescription or medication order for the individual patient.
- In some hospitals the complete floor stock system is successfully operated as a **decentralized** pharmacy under the direct supervision of a pharmacist.

It is the responsibility of the hospital pharmacist, working in cooperation with the nursing service, to develop ways and means whereby adequate supplies of each are always on hand and, in appropriate situation that proper charges are made to the patients' account.

Complete floor stock system

- In this drug distribution system medications are classified under two separate headings:

- charge floor stock drugs: medicines which are stocked on the nursing station at all times and charged to the patient's account after they have been administered to them.

- non-charge floor stock drugs: the medicaments that are placed at the nursing station for the use of all patients on the floor.

DIFFERENCE BETWEEN CHARGED AND NON CHARGE FLOOR STOCK SYSTEM

Charged floor-stock	Non charged floor-stock
I. The charges are made patients account after they been administered.	I. The drugs are not made in the account directly even after the drug have been administered.
II. Every dose of the drug administered to the patient are charged.	II. Charges are made indirectly to the patient.
III. Only the dose of the drug charged which are expensive & rarely used.	III. The cost of the drugs are not as high as the drugs ued are tablets & capsules.
IV. Floor-stock list is prepared which is sent to make the drugs available at all the nursing stations.	IV. A pre-determined listis prescribed by the nursing station.

Complete floor stock system

- **Advantages of complete floor stock system:**

(i) Ready availability of the required drugs.

(ii) Reduction in the number of drug order transcriptions for the pharmacy.

(iii) Reduction in the number of pharmacy personnel required.

- **Disadvantages of complete floor stock system:**

(i) Medication errors may increase because the review of medication orders is eliminated.

(ii) Greater opportunity for pilferage (Theft of content).

(iii) Increased hazards associated with drug deterioration.

(iv) Lack of proper storage facilities on the ward.

(v) Greater inroads are made upon the nurse's time.

Combination of Individual prescription order system and complete floor stock system

- Falling into this category are those hospitals which use the individual prescription or medication order system as their primary means of dispensing, but also utilize a limited floor stock.

- This combination system is probably the most commonly used in hospitals today and is modified to include the use of unit dose medications.

- Requirement of drugs or surgical items are given to the patient who purchase and deposit these items in hospital wards or rooms under supervision of registered nurse.

Unit dose system

- Unit-dose medications have been defined as: *those medications which are ordered, packaged, handled, administered and charged in multiples of single dose units containing a predetermined amounts of drugs or supply sufficient for one regular dose application or use*.

- **Advantages of unit dose system:**

1. Patients receive improved pharmaceutical service 24 hours a day and are charged for only those doses, which are administered to them.
2. All doses of medication required at the nursing station are prepared by the pharmacy thus allowing the nurse more time for direct patient care.
3. Allow the pharmacists to interpret or check a copy of the physician's original order thus reducing medication errors.
4. Elimination excessive duplication of orders and paper-work at the nursing station and pharmacy.

Unit dose system

5. Transfers intravenous preparation procedures to the pharmacy.
6. Promotes more efficient utilization of professional and nonprofessional personnel.
7. Conserves space in nursing units by eliminating bulky floor stock.
8. Eliminates pilferage and drug waste.
9. Extends pharmacy coverage and control throughout the hospital from the time the physician writes the order to the time the patient receives the unit-dose.
10. Communication of medication orders and delivery systems are improved.
11. The pharmacists can get out of the pharmacy and onto the wards where they can perform their intended function as drug consultants and help provide the team effort that is needed for better patient care.

Unit dose system

- Unit dose dispensing procedure divided into:

(1) Centralized unit-dose dispending:

- The characteristic features of centralized unit-dose dispending are that all in-patient drugs are dispensed in unit-doses and all the drugs are stored in a central area pharmacy and dispensed at the time the dose is due to be given to the patient.

- To operate the system effectively, electronic data processing equipment is not required, however delivery, systems such as

  - medication carts are needed to get the unit-doses to the patients

  - suction tube system (called pneumatic tube) or other means are required to send a copy of the physician's original medication order to the pharmacist.

Suction tube system

https://youtu.be/8AyqGwALd0g?si=Gufq073h9QOwL1l1

Unit dose system

(2) Decentralized unit-dose system

- The decentralized unit-dose system operates through small satellite pharmacies located on each floor of the hospital.
- The main pharmacy in this system becomes a procurement, storage, manufacturing and packaging centre serving all the satellites (a decentralised operating unit which has similar function with the central inpatient pharmacy).
- The delivery system is accomplished by the use of medication carts.
- This type of system can be used for a hospital with separate buildings or old delivery systems.

Step-by step outline of the procedure entailed in a decentralized unit-dose system

1. Upon admission to the hospital, the patient is entered into the system. Diagnosis, allergies and other pertinent data are entered on to the Patient Profile card.
2. Direct copies of medication orders are sent to the pharmacist.
3. The medications ordered are entered on to the Patient Profile card.
4. Pharmacist checks medication order for allergies, drug –interactions, drug-laboratory test effects and rationale of therapy.
5. Dosage scheduled is coordinated with the nursing station.
6. Pharmacy technician picks medication orders. Placing drugs in bins of a- Transfer cart per dosage.

Transfer cart

Step-by step outline of the procedure entailed in a decentralized unit-dose system

7. Medication cart is filled for particular dosage schedule delivery#
8. Pharmacist checks cart prior to release.
9. The nurse administers the medication and makes appropriate entry on her medication record.
10. Upon returns to the pharmacy, the cart is rechecked.
11. Throughout the entire sequence, the pharmacist is available for consultation by the doctors and nurses. In addition, the pharmacist is maintaining surveillance for discontinued orders

DRUG DISTRIBUTION AND CONTROL (UNIT DOSE SECTION)

- Medication distribution is the responsibility of the pharmacy.
- The pharmacist, with the assistance of the pharmacy and therapeutics committee and the department of nursing, must develop policies and procedures that provides the safe distribution of all medications and related supplies to inpatients and outpatients.
- For reasons of safety and economy, the preferred method to distribute drugs in institutions is the **unit dose system**.
- Elements of unit dose distribution:

1. Medications are contained in, and administered from, single unit or unit-dose packages.
2. Medications are dispensed in ready-to-administer form.
3. For most medications, not more than a 24-hour supply of doses is provided to or available at the patient care area at any time.
4. A patient medication profile is concurrently maintained in the pharmacy for each patient. Floor stocks of drugs are minimized and limited to drugs for emergency use and routinely used “safe” items such mouthwash and antiseptic solutions.

Procedure

- **Writing the Order.**
- **Medication Order Sheets.**
- **Special Orders.**

1. Writing the Order:

- Medications should be given only on the written order of a qualified physician or other authorized prescriber.
- Allowable exceptions to this rule (i.e., telephoned or verbal orders) should be put in written form immediately and the prescriber should countersign the nurse's or pharmacist's signed record of these orders within 48 (preferably 24) hours.
- Only a pharmacist or registered nurse should accept such orders.

Writing the Order

- Provision should be made to place physician's order in the patient's chart, and a method for sending this information to the pharmacy should be developed.
- Prescribers should specify the date and time medication orders are written.
- Medication orders should be written legibly in ink and should include:

✓Patient's name and location

✓Name (Generic) of medication

✓Dosage expressed in the metric system, (i.e., units)

✓Frequency of administration

✓Route of administration

✓Signature of the physician.

✓Date and hour the order was written

Writing the Order

- Any abbreviations used in medication orders should be agreed to and jointly adopted by the medical, nursing, pharmacy, and medical records staff of the institution.
- Any questions arising from a medication order, should be refer to the ordering physician.
- It is desirable for the pharmacist to make (appropriate) entries in the patient's medical chart pertinent to the patient's drug therapy. Also, a duplicate record of the entry can be maintained in the pharmacy profile.
- In computerized patient data systems, each prescriber should be assigned a unique identifier; this number should be included in all medication orders.
- Unauthorized personnel should not be able to gain assess to the system.

Medication Order Sheets

- The pharmacist (except in emergency situations) must receive the physician's original order or a direct copy of the order before the drug is dispensed.

- This permits the pharmacist to resolve questions or problems with drug order before the drug is dispensed and administered.

- It also eliminates errors, which may arise when drug orders are transcribed onto another form for use by the pharmacy.

Medication Order Sheets

Several methods by which the pharmacy may receive physician's original orders or direct copies are:

A. Self-copying order forms:

- The physician's order form is designed to make a direct copy (carbon or NCR), which is sent to the pharmacy.
- This method provides the pharmacist with a duplicate copy of the order and does not require special equipment.

There are two basic formats:

a. Orders for medications included among treatment orders. Use of this form allows the physician to continue writing his orders on the chart as he has been accustomed in the past, leaving all other details to hospital personnel.

b. Medication orders separated from other treatment orders on the order form. The separation of drug orders makes it easier for the pharmacist to review the order sheet.

Medication Order Sheets

B. Electromechanical:

- Copying machines or similar devices may be used to produce and exact copy of the physician's order.
- Provision should be made to transmit physician's orders to the pharmacy in the event of mechanical failure.

C. Computerized:

- Computer systems in which the physician enters orders into a computer, which then stores and prints out the order in the pharmacy.
- Any such system should provide for the pharmacist's verification of any drug orders entered into the system by anyone other than an authorized prescriber


CARBONEX


eMAR
(Electronic-Medication Administration Record)
Provides Detailed Information
To improve efficiency and safety
Start and Stop Dates
List Trade and Generic name
List dosage, route, and frequency
List when the medication was last given
List when the medication is next scheduled
Associated Data
The user can access related information from nursing assessments and labs.
Monograph
Detailed information regarding the use of the medication

Special Orders

- Special Orders include:
  - emergency orders
  - those for nonformulary drugs
  - investigational drugs
  - restricted-use drugs
  - controlled substances
- Should be processed according to specific written procedures meeting all applicable regulations and requirements

Dispensing of controlled substances

- Addict: Any individual who habitually uses any narcotic drug so as to endanger the public morals, health, safety or welfare, or who is so far addicted to the use of narcotic drugs as to have lost the power or self-control with reference to his addiction.
- Administer: The direct application of a controlled substances to the body of a patient or research subject by a practitioner or his agent or by the patient or research subject at the direction and in the presence of the practitioner.
- Controlled Substances: A drug or other substance, or immediate precursor, included in schedule I, II, III, IV or V of Part B of this title. The term dose not includes distilled spirits, wine, malt beverages or tobacco.

Dispensing of controlled substances

[A] A drug which contain any quantity of (1) barbituric acid or any of the salts of barbituric acid; or (2) any derivative of barbituric acid; or

[B] A drug which contains any quantity of (1) amphetamine or any of its optical isomers; (2) any salt of amphetamine or any salt of an optical isomer of amphetamine; or

[C] Lysergic acid diethylamide; or

[D] Any drug which contains any quantity of a substance which has a potential for abuse because of its depressant or stimulant effect on the central nervous system or its hallucinogenic effect.

Dispensing of controlled substances

Narcotic Drug: means any of the following, whether produced directly or indirectly by extraction from substances of vegetable origin, or independently by means of chemical synthesis, or by a combination of extraction and chemical synthesis.

[A] Opium, coca leaves and opiates.

[B] A compound, manufacture, salt, derivative, or preparation of opium, coca leaves or opiates.

[C] A substance (any compound, manufacture, salt, derivative, or preparation thereof) which is chemically identical with any substance referred to in [A] or [B] above.

- Excluded are decocainized coca leaves or extracts of coca leaves, which do not contain cocaine or ecgonine.

Schedules for controlled substances

(1) SCHEDULE I

[A] The drug or other substance has a high potential for abuse.

[B] The drug or other substance has no currently accepted medical use in treatment in Jordan.

[C] There is a lack of accepted safety for use of the drug or other substance under medical supervision.

(2) SCHEDULE II

[A] The drug or other substance has a high potential for abuse.

[B] The drug or other substance has recurrently accepted medical use in treatment in Jordan or a currently accepted medical use with severe restrictions.

[C] Abuse of the drug or other substances may lead to severe psychological or physical dependence.

Schedules for controlled substances

(3) SCHEDULE III

[A] The drug or other substance has a potential for abuse less than the drug or other substances in schedules I and II.

[B] The drug or other substance has a currently accepted medical use in treatment in Jordan.

[C] Abuse of the drug or other substances may lead to moderate or low physical dependence or high psychological dependence.

(4) SCHEDULE IV

[A] The drug or other substance has a low potential for abuse relative to the drug or other substances in schedules III.

[B] The drug or other substance has a currently accepted medical use in treatment in Jordan.

[C] Abuse of the drug or other substances may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in schedule III.

Schedules for controlled substances

(5) SCHEDULE V

[A] The drug or other substance has a low potential for abuse relative to the drugs or other substances in schedules IV.

[B] The drug or other substance has a currently accepted medical use in treatment in Jordan.

[C] Abuse of the drug or other substances may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in schedule IV.

Schedules for controlled substances

Prescriptions

The following requirements should be considered with prescriptions:

1. Drugs may be dispensed on the oral prescription in an emergency situation.
2. Controlled substances in Schedule III or IV may not be dispensed without a written or oral prescription in conformity.
3. Such prescriptions may not be filled or refilled more than 6 months after the date there of or be refilled more than 5 times after the date of the prescription unless renewed by the practitioner.
4. No controlled substance in Schedule V that is a drug may be distributed or dispensed other than for a medical purpose.
5. Prescriptions filled with controlled substances in Schedule II may be written in ink and must be signed by the practitioner issuing them.
6. Prescriptions for narcotic substances in Schedules III, IV and V, must be kept in a separate file.

Schedules for controlled substances

Registration of doctors who can prescribe Controlled Drugs

- Doctors (Practitioners), in order to prescribe narcotics for or order administered (dispensed) to their patients in the hospital, must be licensed to practice under the laws of Jordan.

Responsibility for controlled substances

- The administrative head of the hospital is responsible for the proper safeguarding and the handling of controlled substances within the hospital.
- Responsibility for the purchase, storage, accountability and proper dispensing of bulk controlled substances within the hospital is delegated to the Pharmacist-in-Chief.
- The Head Nurse of a nursing unit is responsible for the proper storage and use of the nursing unit's controlled substances.

Schedules for controlled substances

Preparation of orders

All controlled substances orders and records must be typed or written in ink or indelible pencil and signed in ink or indelible pencil.

Telephone orders

- A doctor may order a controlled drug by telephone in case of necessity.
- The nurse will write the order on the doctor's order sheet, stating that it is a telephone order and will sign the doctor's name and her own initials.
- The controlled drug may then be administered at once.
- The order must then be signed by the doctor with either his signature or his initials within 24 hours.

Verbal orders

- A verbal order may be given by a doctor in an extreme emergency where time does not permit writing the order.
- The nurse must write the order on the doctor’s order sheet.
- The doctor must sign the order with either his signature or his initials within 24 hours.

Schedules for controlled substances

Information on daily controlled drug administration sheet is as follows:

1. Date.
2. Amount given.
3. Patient’s full name
4. Patient’s hospital number.
5. Name of doctor ordering.
6. Signature of nurse administering.

Thank you

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