

Pharmacy Technician Program

Chapter 9: Hospital & Institutional Pharmacy Practices

Coursework 101





Hospital & Institutional Pharmacy Practices

This chapter provides an overview of disease, sterilization, medication orders, home health care and pharmacy automation.



Pharmacy Classifications

A. State Classifications

1. Laws vary from state to state, go to <http://www.nabp.net/> and click on “Board of Pharmacy” and then click on United States for a list of all 50 State Boards of Pharmacy to find the regulations for your state.
 - a. Texas State Board of Pharmacy has five classifications of pharmacies:



Pharmacy Classifications

- i. Class A Community (Retail pharmacy).
- ii. Class B Nuclear.
- iii. Class C **Institutional (aka Hospital pharmacy).**
- iv. Class D Clinic Pharmacy.
- v. Class E Non - resident Pharmacy.



Institutional (Hospital) Pharmacy

A. Hospital Types a Pharm Tech may encounter:

1. Teaching hospitals...train MDs, interns, residents and other healthcare providers.
2. Pediatric Hospitals...care for and treat infants and children
3. Long term care facilities...require constant supervision and around-the-clock care.
4. Specialty Hospital (Burn, Psychiatric, Oncology units, etc.)



Institutional (Hospital) Pharmacy

B. Hospitals have two kinds of patients:

1. **Inpatient (admitted to hospital for more than 24 hours).**
2. **Outpatient (not admitted, or admitted and discharged in less than 24 hours).**



Institutional (Hospital) Pharmacy

C. Chain of Command as it relates to training a pharmacy technician.

- 1. The pharmacist manager**
- 2. Policy and Procedures**
- 3. Protocol**
- 4. State and federal guidelines**
- 5. Department of Public Health (Medicare or Medicaid)**
- 6. State board of pharmacy (TSBP)**



Institutional (Hospital) Pharmacy

7. DEA (Drug Enforcement Administration/ Agency)
8. OSHA (Occupational Safety & Health Administration)
9. **The Joint Commission (TJC) formerly known as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO).**
 - a. **Inspects hospitals to see if facility meets JCAHO standards; the rigorous inspection process by TJC/JCAHO is voluntary but necessary for payment by insurance. TJC/JCAHO awards accreditation status to hospitals that meet its standards.**



Institutional (Hospital) Pharmacy

10. Centers for Medicare & Medicaid Services (CMS), formerly known as the Health Care Financing Administration (HCFA), oversees Medicare, Medicaid, and HIPAA.



Institutional (Hospital) Pharmacy

D. Hospital Formulary ... A list of approved drugs, dosage forms, package sizes, and drug strengths, providing the basis from which physicians select the most appropriate drug for each patient.

1. Primary factors that determine inclusion of a drug on a formulary (list of medications approved for use in an institution) are:



Institutional (Hospital) Pharmacy

- a. Covered by insurance.
- b. Risk.
- c. Efficacy- effectiveness, meaning, does the drug produce the desired effect.
- d. Cost- some companies may bid for inclusion on formulary lists.
- e. Generic vs. brand name (trade, proprietary).



Institutional (Hospital) Pharmacy

E. Pharmacy and Therapeutics (P&T) Committee

1. Primary function: to formulate policies pertaining to pharmaceutical use in the hospital.
2. Made up of doctors, nurses, pharmacists, other healthcare professionals.
3. Changes in the drug formulary at a hospital must be approved by the P&T Committee.



Pharmacy Tech Responsibilities in an Institutional Pharmacy

A. Responsibilities

1. Chain of Command in a hospital pharmacy.
 - a. Answers to the Pharmacist in charge.
 - b. The Pharmacist in charge answers to a Hospital Administrator.
 - c. The Hospital Administrator answers to the hospital's President or Chief Executive Office (CEO).
 - d. The president or Chief Executive Officer (CEO) of a hospital reports to the board of directors.



Pharmacy Tech Responsibilities in an Institutional Pharmacy

2. Techs prepare parenteral IVs.
 - a. Large Volumes (250 ml and up), TPNs, IVPBs (100 ml and below), Chemotherapy.
3. Techs fill and deliver controlled substances to all areas of the hospital.
 - a. Techs order medications and supplies for the pharmacy, order specialty items for other areas of the hospital, handle returns and recalls, handle invoices and put stock away.
4. They fill prescription orders as patients are discharged from the hospital, and they fill STAT orders.



Pharmacy Tech Responsibilities in an Institutional Pharmacy

5. Techs may be responsible for all tasks related to a small, isolated pharmacy such as answering phones, ordering and putting away stock, transcribing, preparing medications (oral and parenteral), pulling medication orders, make deliveries to nursing stations
 - a. They also fill patient medication drawers, deliver carts, refill crash carts, restock floor stock, refill automated medication dispensing systems, and they fill requisitions, stock inventory, check for out-of-date drugs.



Pharmacy Tech Responsibilities in an Institutional Pharmacy

6. Floor stock- supplies kept on hand in different units of the hospital.
 - a. **May be ordered by nursing staff, but is the responsibility of the pharmacy personnel to maintain, restock and check for out-of-dates.**
7. May be responsible for entering patient information in the computer, entering medication orders in the computer, entering and maintaining formulary and drug information into the computer.



Pharmacy Tech Responsibilities in an Institutional Pharmacy

B. PAR level-Periodic Automatic Replenishment.

1. Types of medications may vary by specialty unit (Anesthesia, ER).
2. May be contained in an automated drug delivery system (Pyxis, Suremed, Robot RX).



Disease

A. Micro-organisms and Disease

1. In ancient days, people had no understanding of the causes of illnesses and diseases, and generally attributed them to evil or malign spiritual influences.
2. Pathogens – disease-causing microorganisms.
3. Pathogenic – capable of causing disease.



Disease

4. Not all microorganisms cause disease.
 - a. Some microorganisms perform essential functions, such as creating by-products used as medicine, fermenting wine, or helping the body to breakdown various food substances.



Disease

B. Viruses

1. **Small microorganism, which need a living host to reproduce. Some examples include: Colds, Measles, Chicken Pox, Influenza (flu), & HIV (not AIDS, which is a disease).**



Disease

C. Bacteria

1. Small, single-celled microorganisms exist in three main forms:

- a. Round/ Spherical (cocci)
- b. Rod-shaped (bacilli)
- c. Spiral-shaped (spirilla)



Disease

2. Bacteria cause a wide variety of illnesses.
 - a. Some examples are: Salmonella poisoning, Strep Throat, Whooping Cough, Syphilis, Rheumatic Fever, Pink Eye, Boils, Bubonic Plague, Pneumonia, and Acne (Pimples).
3. Bacteriostatic means to inhibit growth of bacteria.



Disease

D. Fungi

1. Microscopic plants often exist as molds, mildews, mushrooms, rust, and smut, and act as parasites, feeding on both living organisms and dead organic material, and reproducing by means of spores.
2. Spores and many other fungi are microscopic and travel through the air.
3. Some are implicated in diseases such as athlete's foot and ringworm.



Disease

E. Protozoa

1. Microscopic animals which live in water or as parasites inside other creatures. Malaria is a good example.



Asepsis & Sterilization

A. Terms

1. **Universal Precautions – A set of standards that lower the possibility of contamination by pathogens (disease causing microorganisms) carried in blood and body fluids, i.e. procedures used to prevent infection caused by exposure to blood or other bodily fluids.**
2. **Asepsis - absence of disease-causing microorganisms.**



Asepsis & Sterilization

3. Aseptic technique - the process of manipulating sterile products to prevent the introduction of pathogens. (not the same as sterile).
4. Sterilization - any process that destroys the micro-organisms in a substance.
5. Gauge - size of the needle opening.
6. Laminar flow hood - environment for preparation of sterile products.



Asepsis & Sterilization

7. Horizontal flow hood - environment for preparation of sterile products, employing air flow from the back of the hood toward the front of the hood and out into the room.
8. Vertical flow hood - environment for preparation of chemotherapy medications employing air originating from the roof of the hood moving downward and captured in a vent located on the floor of the hood.
9. HEPA (High Efficiency Particulate Air) filter - filters 99.97% of particles, 0.3 microns or larger are removed.
10. Parenteral - medications administered by injection (IV, IM, ID, IA, SQ, etc.).



Asepsis & Sterilization

11. Hyperalimentation - Parenteral nutrition for persons unable to eat.
12. **Total Parenteral Nutrition (TPN) - Large volume IV nutrition administered through the central (subclavian) vein.**
13. Peripheral Parenteral - Injection of a medicine into the veins located on the periphery of the body instead of injecting a central vein or artery.



Sterilization

A. Heat Sterilization

1. Heat sterilization is the most common method for killing the most resistant microbial life form present.
2. Boiling - kills vegetative forms, many viruses, and fungi in about ten minutes.
3. **Autoclave** - a device that generates heat and pressure to sterilize (about 15 minutes); autoclaves sterilize using heat and pressure to kill pathogens and are **the most common piece of equipment used to sterilize instruments.**



Sterilization

B. Dry Heat Sterilization

1. Direct flaming.

- a. Practical for disposal of contaminated objects, which are often incinerated.

C. Mechanical Sterilization

1. Achieved by means of filtration, which is the passage of a liquid or gas through a screen-like material containing pores small enough to block microorganisms.



Sterilization

D. Gas Sterilization

1. Ethylene Oxide gas is used in objects that are subject to destruction by other means of sterilization.

E. Chemical Sterilization

1. Destruction of microorganisms on inanimate objects by chemical means.
2. Few chemicals produce complete sterility. Instead, they reduce microbial numbers to safe levels.
3. A disinfectant is a chemical applied to an object or topical to the body for sterilization purposes. An example would be: Alcohol, Bleach, Iodine, etc.



Contamination

- A. Touch- under nails; touch is the most common source of contamination when preparing sterile products.
- B. Air- moisture droplet
- C. Water- Tap water



Syringe & Needle

A. Parts of a syringe:

1. Plunger flange
2. Flange
3. Barrel
4. Plunger
5. Tip

B. Parts of a needle

1. Point
2. Bevel
3. Lumen
4. Shaft
5. Hub



Medication Orders and Unit Dose Medications

A. Medication orders

1. **Prescriptions in a hospital are called medication orders or physician orders.**
2. The physician writes the order in patient's chart.
3. The healthcare provider proceeds to send it to the pharmacy.
4. The pharmacy enters the order into a computer and the order is filled.
5. The pharmacy sends the medication back to the unit.
6. A nurse will administer or in an outpatient the patient will pick up or take home.
7. Sometimes, the doctor will enter the order directly into the computer.



Medication Orders and Unit Dose Medications

B. Unit Dose

1. **Unit dose is an amount of drug prepackaged for a single dose (one unit equals one dose).**
2. **Hospitals dispense most patient medications in the form of a unit dose.**
3. **May include tablets, capsules, oral liquids, injectable drugs, and suppositories.**



Medication Orders and Unit Dose Medications

4. Many medications are prepackaged by drug manufacturers.
 - a. Typical unit dose packaging includes heat-sealed strip packages, blister packs, and adhesive sealed bottles (NOT amber prescription vials).
 - b. In order to be used in an automated system, some medications may be bar coded.
 - c. Ointments, creams, eye drops, nasal sprays, ear drops, and inhalers are not generally packaged in unit dose form (exceptions are Nitrobid ointment, Neosporin ointment).



Medication Orders and Unit Dose Medications

5. Tablets, capsules, oral liquids that don't come in unit dose form are repackaged by the pharmacy.
6. Repackaging - if a product on formulary is not available from the manufacturer in unit-dose packaging, the technician should order bulk and repackage in unit-dose packaging.
 - a. Repackaging refers to preparing unit doses of tablets, capsules, liquids, IV medications and suppositories not commercially available.
 - b. Repackaged items may be packaged in heat sealed zip-lock bags, blister packs, heat-sealed strip packages, plastic or glass cups, plastic oral syringes, heat-sealed aluminum cups.



Medication Orders and Unit Dose Medications

7. Oral syringes must be labeled “For Oral Use Only”.
8. A pharmacy must keep a log of all repackaged medication.



Medication Orders and Unit Dose Medications

C. The repackaging log should include:

1. internal control or lot number,
2. drug strength and dose form,
3. manufacturer's expiration and lot number,
4. concentration if it is an IV med,
5. quantity of units (how many packaged),
6. initials of the repackager and the initials of the RPh who checks the repackaging.

Note: The date the drug was repackaged is not required.



Medication Orders and Unit Dose Medications

7. Repackaging records should be kept for three years.
8. Records are for tracking recalls and quality assurance.
9. Expiration date for repackaged drugs is six months or $\frac{1}{4}$ of the manufacturer's expiration date, whichever represents the shortest date.
10. Most hospitals use the 6 month rule.



Medication Orders and Unit Dose Medications

D. Medication Fill List

1. Sometimes called a cart fill list.
2. Generated each day by computer.
3. List of all the current medications of all the patients in the hospital.



Medication Orders and Unit Dose Medications

4. Used to determine how many doses of a medication to send to the nursing unit for a 24-hour supply. (Stop and review Military Time Chart and Using Military Time handouts).
5. Also used for determining which drugs have been discontinued and need to be pulled from a patient's drawer or cassette.
6. Also used to determine which patients have been discharged and need to have their meds pulled.
7. May be used for billing and crediting purposes.



Home Health Care and Long Term Care Settings

- A. Home Health Care - Delivery of medical, nursing, and pharmaceutical services to patients who remain at home.**
 - 1. Techs provide educational material, may compound medicines, may deliver medications, may package unit dose medications and prepare IV solutions.**



Home Health Care and Long Term Care Settings

- B. Long-Term Care - Provides institutional services to elderly patients and/or others who cannot take care of themselves.**
- 1. A nursing home is an example of a long term care facility.**
 - 2. May include adult day care services for people with psychiatric disorders or medical disorders.**
 - 3. May employ a pharmacist on staff or may use an outside consulting pharmacist.**



Home Health Care and Long Term Care Settings

4. Tech may log prescriptions in the computer, do billing, package and label medications, deliver medications to nursing stations, maintain records, work in the nursing home alongside the consultant pharmacist, reviewing medication carts and storage areas.



Hazardous Materials

A. Hazardous Materials... information on how to handle hazardous substances at your facility may be found in a policy and procedure manual.

1. More risk in a hospital than retail.
2. Corrosive materials (can dissolve or eat away at bodily tissues).
3. Cytotoxic materials (materials that are poisonous to cells).
4. Anti-neoplastic drugs (used to treat cancer).



Hazardous Materials

B. Four routes of exposure

1. Trauma (needle stick or cut).
2. Inhalation (Broken bottle may release a fine mist).
3. Direct skin contact.
4. Ingestion (Dust from crushed tablet or cleaning a counting tray).

NOTE: The first thing a pharmacy technician should do when a body area is exposed to a hazardous substance is to always wash the contaminant off yourself first (flood area with water and thoroughly clean with soap and water); then seek help and medical attention, then notify the director of pharmacy.



Hazardous Materials

C. Storage of Hazardous Materials (Hazmat)

1. Storage bins should have a barrier at the front.
2. Carts should have rims.
3. Should be stored at eye level or lower.
4. Gloves worn when checking in the order.
5. Hazardous substance needing refrigeration should be stored separate from other drugs in bins that prevent breakage and control leakage.



Hazardous Materials

D. Protective clothing (Demo)

1. Inspect damaged packages under a vertical hood.
2. Eye protection, respirator, gloves, disposable gown, hair covers, shoe covers.
3. Double glove, change gloves every 20 minutes or immediately if they tear or get holes.
4. Wash hands before and after.
5. Take protective clothing off in the area of the spill and discard it in a hazardous waste container.



Hazardous Materials

E. Spills

1. A spill kit should be used during spills up to 1000mL.
2. An incident report must be filled out.
3. Skin should be flooded with water, and Poison Control should be contacted for further instructions.
4. Normal saline for irrigation to cleanse eyes.
 - a. Note: The spill kit is a specialty kit that contains absorbent material, protective gear, and cleaning supplies for specific drugs spills, e.g. chemotherapy drug spill.



Automation in the Pharmacy

A. Automation overview

1. In order to reduce errors February 24, 2004 the FDA began requiring bar coding on all prescription drugs, blood products and some OTCs.
2. Automation includes entering orders or prescriptions into the computer, robotics, repackaging, cart fills, floor stock, counting pills for Rx, ordering, and billing.



Automation in the Pharmacy

- B. Technology in the pharmacy increases the efficiency of the staff in the pharmacy, which should increase the amount of time spent on clinical and direct patient care.
1. **All work done by a pharmacy technician, even if automation is involved, should be double checked by the pharmacist.**
 2. Although expense for the automation may be considerable, it should save money in the long term.



Automation in the Pharmacy

C. Automation in the community pharmacy

1. Parata robotic dispensing system - processes a prescription every 18-25 seconds.
2. ScriptPro tracks and dispenses prescriptions.
3. Baker Universal and Baker Cells- automatic counters that have the ability to automate compounding.
4. Automated inventory and order systems.



Automation in the Pharmacy

D. Automation in the institutional pharmacy

1. Pyxis automated drug delivery system - ATM for drugs
 - a. usually touch-screen
 - b. dispenses meds in a way like a vending machine
 - c. some pyxis machines require a fingerprint to access



Automation in the Pharmacy

- d. be sure to carefully select and chart accurately the amount (number) of meds given as a check is done daily and you will answer for any discrepancies**
 - i. the system alerts and saves you from miscounting**
- e. some hospitals put all the PRN medications in the pyxis**
 - i. select your patient from a list and pick the PRN, you choose which med to give and it dispenses only as many as you choose.**



Automation in the Pharmacy

2. Other Automation

- a. SureMed
- b. Robotics fill cart fills for inpatients
- c. Scanners and barcodes
- d. IV mixing machines
- e. Drug and medical references available on computer and online.
- f. Passport- Automation in Long Term Care-Dispensing system connected to the pharmacy which allows for unit of use meds to be dispensed in the nursing home.