

# Hospital Pharmacy

## Chapter 10

# Objectives

- Define the most common tasks performed by hospital pharmacy technicians.
- Identify hospital units according to their specialty.
- Explain the functions of various hospital pharmacies.

# Objectives (cont'd)

- List the patient information required for processing orders.
- Describe the functions of satellite pharmacies.
- Recognize the differences in floor stock depending on the area of the hospital.

# Objectives (cont'd)

- List special unit services and the type of stock they require.
- Explain the reasons for stock rotation, PAR levels, and ordering practices.
- Describe how ADS machines help to keep PAR levels, increase speed and control inventory.
- Describe the differences between horizontal and vertical laminar flow hoods.

# Objectives (cont'd)

- List the types of medications used on crash carts and the areas that stock them.
- Explain the increased use of gloveboxes as it relates to USP <797>.
- Describe how CPOE systems are used in medication ordering.

# Objectives (cont'd)

- List the types of medications used on crash carts and the areas they are stocked in.
- Explain why and how investigational drugs are used in a hospital setting.
- List 3 types of purchasing systems used in pharmacy.

# Introduction

- Hospital pharmacy: most challenging area to work
- Fewer job openings for technicians
- More highly skilled technicians required

# Introduction (cont'd)

- Tasks taken over by technicians:
  - IV medication preparation
  - Loading of patient medication drawers
  - Patient data entry

# Types of Hospitals

- Size of hospital: number of beds available for patients
  - Small: 50 beds or fewer
  - Large: 50 to 250 beds or more
- Other differences: capabilities of diagnosis, surgery, outpatient services

# Types of Hospitals (cont'd)

- Differences: layout of pharmacies
- Older hospitals: central inpatient pharmacy
- Larger, newer hospitals: central and satellite pharmacies
- Teaching hospitals: pediatrics, burn units, ICUs, cancer units

# Policies and Procedures

- Policies & Procedures Handbook is found in all pharmacies.
- It outlines facility's rules.
- Rules apply to all employees.
- Information concerns daily work activities, benefits, emergency situations, mandatory training.

# Hospital Protocol

- Term is used to define the guidelines within hospital settings.
- Committee—pharmacists, doctors, nurses, other healthcare workers, administrators—make changes in protocols.
- Purpose: to choose best medicine for patient.

# Hospital Standards

- Hospitals all must meet federal and state guidelines.
- Department of Public Health sets standards of safe operation.
- Board of Pharmacy inspects and ensures that personnel are working within guidelines.

# Agencies

- Agencies that govern operations
- The Joint Commission: accreditations and inspections
- Health Care Financing Administration
- Department of Public Health
- Board of Pharmacy

# The Flow of Orders

- Doctor visits patient; writes medication order (equivalent to prescription).
- Order: written on doctor's order sheet; placed in patient's record.
- Doctor, nurse, unit clerk: input admitting information in patient's record.

# The Flow of Orders (cont'd)

- As orders arrive, they are entered into the computer.
- If an order is unclear or if there is a question, the pharmacist calls the doctor.

# The Flow of Orders (cont'd)

- Patient information:
  - Full name
  - Date of birth
  - Medical record number
  - Room number
  - Diagnosis, weight
  - Drug allergies

# The Flow of Orders (cont'd)

- Orders arrive in pharmacy around the clock, 365 days a year.
- Various methods used to send orders: pneumatic tube system, computerized physician order entry, fax machine, staff or volunteers deliver to pharmacy.

# The Flow of Orders (cont'd)

- Name alert stickers used when two patients with same last name on same floor.
- As orders are entered labels are produced.
- Technician pulls off printer and fills order.
- Labels placed on small zipper baggies for delivery.

# The Flow of Orders (cont'd)

- STAT: “at once” orders to be delivered within 15 minutes.
- ASAP means “as soon as possible.”
- Orders filled immediately in emergency situations.

# Point of Entry

- Electronic systems that can quickly and clearly transfer patient information to and from the pharmacy
- Provide electronic access to medical information and drug information data, limiting errors of transcription

# Computerized Prescriber Order Entry

- Medication orders can be clearly identified and the computer systems check new medications against current medications for interactions or contraindications.
- Doctors can enter all labs, dietary requirements, medications and special notes in the computer.

# Barcode Point of Entry

- Each unit dosed medication is bar-coded and can be scanned with a handheld device.
- Nurses are alerted to any special notes or warnings as they verify each dose for the patient.

# Computerized Adverse Drug Event Monitoring

- Computerized systems can detect and monitor adverse drug events.
- Pharmacies must make sure all medications are bar coded for identification.
- The information in the computer must accurately reflect the way the dosage form is to be given.

# Responsibilities of an Inpatient Technician

- Some pharmacies open 24 hours a day, 7 days a week
- Technicians: flexibility needed to work all shifts; multifunctional for all shifts

# Common Job Descriptions

## Technician Responsibilities

IV room

Chemotherapy

Controlled substances

Patient medication filling

## Description

Prepares all parenteral IV preparations, including large-volume drips and parenteral nutrition.

Prepares chemotherapy and other medications that may accompany these agents.

Gathers all controlled substance inventory sheets from all areas of the hospital; technician may also fill and deliver all controlled substances; the pharmacist is required to verify pharmacy inventory on a daily basis.

Fills medication drawers on a pharmacy cart that will deliver medications to all hospital patients; may also deliver carts to all patient areas and restock any floorstock medications; if the hospital uses an automated medication dispensing system instead, the technician will need to fill this unit on all floors.

# Common Job Descriptions (cont'd)

## Technician

### Responsibilities

Filling requisitions

### Description

Fills all requisitions sent to the pharmacy; stocks inventory; may also be responsible for checking areas containing medications for out-of-date drugs or overstocked medications that need to be returned to the pharmacy.

Inventory

Orders all medications and supplies for the pharmacy; may also order specialty items for other areas of the hospital; handles all returns and recalled items that need to be sent back to the manufacturer; responsible for handling all invoices as well as putting all stock away in the appropriate bins.

# Common Job Descriptions (cont'd)

## Technician

### Responsibilities

Discharge pharmacy

### Description

Fills prescription orders as patients are discharged from the hospital; medications are either sent to the floor for the patients or patients may come to the pharmacy window to pick them up.

Satellite pharmacy

May be responsible for all tasks related to a small, isolated pharmacy such as answering phones, ordering and putting away stock, preparing parenteral medications, transcribing, pulling all medication orders, and making deliveries to nursing stations.

Miscellaneous duties

Ability to work in all areas of pharmacy as needed.

# Patient Cassette Drawers

- A long-standing daily task of a technician is loading the patient cassette drawer from a pick station.
- Medications that will be needed for the next day must be loaded in a cassette drawer.

# Patient Cassette Drawers (cont'd)

- The patient cassette drawers are held in large push carts so they may be delivered to the floor each day.
- A robot-dispensing machine fills each patient's medication cassette with 99% accuracy as the cassette moves along a conveyer belt.
  - Speeds up delivery of medication and helps ensure accuracy.

# Preparing Unit Dose Medications

- An important daily task technicians perform is the preparation of unit dose medications that are not available from the manufacturer or stocked by the pharmacy.
  - Pharmacist performs the final check.

# Unit Dose Liquids

- The Joint Commission now requires hospitals to make all medications patient-dose specific.
  - Every liquid dose is prepared in a unit dose package and labeled before sending it to the patient's room.

# Controlled Substances: Description

- Countng, dispensing, tracking narcotics is a critical job.
- Each hospital conducts actual count of controlled substances by two nurses every shift.
- All controlled substances counted three times daily.

# Controlled Substances: Description (cont'd)

- Periodic automatic replenishment (PAR) levels: amounts of medications kept on floors at all times
- Technician retrieves sheets daily from all units
- Controlled substances kept in locked room in pharmacy at all times

# Controlled Substances: Description (cont'd)

- Written records must be written in pen.
- All inventories are completed by registered pharmacist.

# Controlled Substances: Duties

- After confirmation of daily narcotic count, technician signs out each drug onto dispensing sheet used to deliver medications.
- In delivery: keep controlled substances nonidentifiable
- Controlled substances are placed in stapled brown bags.
- Never let these out of sight.

# Controlled Substances: Duties (cont'd)

- Counting of narcotics done by nurse and technician.
- Returned controlled substances to pharmacy validated in pharmacy.
- Signatures for controlled substances done by registered nurses, not licensed practical nurses (LPNs).
- Make sure all numbers are correct.

# Daily Iv Preparation Duties

- Daily routine:
  - Printing of IV labels
  - Keeping up with changes in patient status
  - Reconstituting and preparing all IV medications in horizontal flow hood
  - Delivers medications to nursing floors

# Aseptic Technique

- Method used to prevent contamination of an object by microorganisms
- Use is extremely important in preparing all IV medications, chemotherapy, ophthalmics
- Samples periodically tested for microbial contamination

# *USP <797>*

- Regulations for facilities who fill sterile products
- Regulations are now enforceable due to increased contamination and medication errors

# Intravenous Technician Description

- Responsible for preparing, labeling all antibiotics
- Large volume drips (heparin, aminophylline)
- Potassium drips
- Lactated Ringer's

# Intravenous Therapy and Chemotherapy Preparation

- Technician is responsible for preparation of both IV therapies and chemotherapies.
- Horizontal flow hood used for preparing IV medications.
- Vertical flow hood used for preparation of chemotherapy.

# Airflow



**Horizontal Flow Hood**

(Courtesy of NuAire, Inc. © 2011)



**Vertical Flow Hood**

(Courtesy of NuAire, Inc. © 2011)

# IV Therapy and Chemotherapy Preparation Description

- Chemotherapy: technicians must wear a gown and double gloves.
- Horizontal flow hood: orientation of hands must not block flow of air.
- Vertical flow hood: hands must not move over the top of any vial, needle, or IV bag.

# Labeling: Description

- Proper placement of labels ensures visibility of the solution and contents.
- Technician must initial all medications.
- Pharmacist checks each prepared medication before delivery to floors.

# Labeling: Description (cont'd)

- Additional information:

- Use of light-protected bags for light sensitive drugs
- Refrigerated drugs
- Storage requirements
- Medication stabilities

# Labeling Duties

- All drugs must be labeled before leaving pharmacy.
- Expiration dates extremely important.
- All IV medications returned to stock if not expired.
- Julian date: the day of the year that does not take into account the month.

# Labeling Duties (cont'd)

- Labels placed squarely onto medication; clear and easy to read
- Drug label initialed by technician; checked and initialed by pharmacist

# Inventory Control Technician: Description

- Technician maintains stock levels.
- Completes special ordering of medications.
- Is responsible for ordering, billing, restocking.

# Inventory Control Technician: Description (cont'd)

- Methods of keeping stock at necessary levels: ordering cards, bar codes, handheld scanner devices, manufacturer stickers

# Inventory Control Technician Duties

- Orders are placed using a computer.
- Turnaround times for shipments vary.
- Right time to order medications.
- Crucial to keep pharmacy completely stocked with necessary medications.

# Inventory Control Technician

## Duties (cont'd)

- Shipment verified against inventory list.
- Initial and write “received.”
- Medications sometimes backordered.
- Loan/borrow sheet used to obtain medications from another pharmacy.

# Inventory Control Technician

## Duties (cont'd)

- Placing stock on shelves
- Stock needs to be rotated
- Later expiration dates placed back on shelf
- Earliest expiration dates used first
- Return damaged items, expired agents
- Handle recalled items

# Supplying Specialty Areas

- For a list of primary units and clinics that require medication from pharmacy, see Box 10-1.
- Floorstock: supplies kept on hand in units
- Pharmacies: supply special preprinted forms with descriptions of commonly used drugs for specialty areas.
- Outdated medications must be checked monthly.

# Supplying Specialty Areas (cont'd)

- Outdated medications returned to pharmacy if expiration is within 3 months
- Manufacturer will credit
- Outside company contracted to do drug inventory on expired medications

# Supplying Specialty Areas Duties

- OR, PACU, Wards, Clinics stocked with own type of medications
- ED, OR, ICU stock many drugs in injectable form, also oral and injectable controlled substances

# Supplying Specialty Areas Duties (cont'd)

- Pediatrics use medications in lower doses and in suspension form,
- Labor & Delivery stocks injectables meant for labor, contractions, and cesarean births,
- Technician collects and fills all floor stock medications,

# Supplying Specialty Areas Duties (cont'd)

- Technicians also refill crash carts in all areas of the hospital.
- See Table 10-3, Crash Cart Medications.

# Nonclinical Areas the Pharmacy Stocks

- Anesthesia
- Respiratory
- Injection clinic
- Radiology or imaging department

# Central Supply

- Central supply stocks boxes of large volume IV drips and mixtures as well as dressing, tubing, and instruments used by various departments.
  - Pharmacy orders include sterile water and various strengths of premade KCL drips, lactated ringers.

# Glove Boxes

- Glove boxes added to all hospitals that prepare large volumes of IVs in order to decrease the possibility of contamination.
- They are used for higher risk IV admixtures per USP <797> regulations and are rated as Class III.
- Technician never comes in direct contact with the medication while manipulating it in the hood.

# Automated Dispensing Systems

- Pyxis MedStation 3000 system
  - User's fingerprint is scanned and verified before the system grants the user access.
- Other systems rely on passwords or identification swipe cards to control access.
  - Cards can be stolen.

# Automated Dispensing Systems (cont'd)

- The pharmacy can run reports to identify:
  - Who accessed the station
  - When it was accessed
  - Which medication was removed
  - How much of each medication was supposed to have been removed

# Automated Dispensing Systems (cont'd)

- ADMs hold all types of stock, which is useful for:
  - Inventory control
  - Decreased wait time
  - Accuracy

# Additional Areas of Pharmacy

- Satellite pharmacies are small specialty pharmacies that supply Emergency Department or entire floor.
- Many hospitals connect inpatient and discharge pharmacies together.

# Satellite Pharmacies

- Duties include:
  - Filling all medication orders
  - Being responsible for delivery
  - Answering phones
  - Stocking
  - Filling STAT orders

# Discharge Pharmacy

- Fills prescriptions like a community pharmacy but located in the inpatient pharmacy.
- Doctor's orders written on special discharge forms.

# Duties of the Technician Working in a Discharge Pharmacy

- Technician processes prescriptions same as outpatient pharmacy.
- Complete orders sent back to floor for nurse to dispense to patient.
- Controlled substances: nurse brings patient down to pharmacy to receive medications and for consultation.

# Pharmacy and Nursing Staff Relationship

- Pharmacy staff works more with nurses than anyone else in hospital.
- Nurses depend on pharmacy for all medications.
- Nurses make 80% of phone calls to pharmacy.
  - Instant messaging is growing in use.

# Pharmacy and Nursing Staff Relationship (cont'd)

- Inquiries about status of patients' medications, drug interactions, dosing ranges, calculations
- Most common question: “Where are the medications that I ordered?”

# STAT and ASAP Orders

- STAT orders:
  - Are filled within minutes.
  - Take precedence over others.
  - They can be filled within 15 minutes.
  - They can mean the difference between life and death.
  - Hand deliver STAT orders.

# STAT and ASAP Orders (cont'd)

- ASAP order:
  - ASAP not as urgent as STAT.
  - Should still be processed quickly.

# Specialty Tasks

- Assisting in clinical duties
- Anticoagulant therapy
- Nuclear medication pharmacy

# Investigational Drug/Biologic

- **Investigational drug is** an agent not yet approved by the FDA for use.
  - FDA must approve use in clinical trials.
- They are signed in by the pharmacist and stored separately from other drugs.
- Once the study is complete, the remaining drugs are to be returned to the sponsor along with the log records.