PHT 52B: ASEPTIC TECHNIQUE & IV PREPARATION

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2021
Units:	4
Hours:	3 lecture, 3 laboratory per week (72 total per quarter)
Prerequisite:	PHT 52A.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade Only
Repeatability:	Not Repeatable

Student Learning Outcomes

- Describe the main components of the infection cycle and factors affecting survival of bacteria and utilize various methods of preventing the spread of micro-organisms and contaminants.
- Introduction to aseptic compounding principles, techniques, precautions, and regulations governing preparation of sterile compounds.

Description

This course provides technician-focused instruction and training for the successful production of sterile parenteral preparations, a major responsibility of the pharmacy technician in hospitals, long-term care facilities, and home healthcare. This important work requires the mastery of aseptic technique: the procedures that avoid introducing pathogens into sterile products, ensure patient safety, and maintain product consistency. Intended for students in the Pharmacy Technician Program; enrollment is limited to students accepted in the program.

Course Objectives

The student will be able to:
A. Identify the ethical and legal obligations of sterile compounding personnel, including training and assessment requirements.
B. Identify supply items used in sterile compounding and describe appropriate technique to maintain the sterility of their critical sites.
C. Perform the calculations required for dosage determination and solution preparation.
D. Utilize various documentation in quality assurance; including process validation testing and identifying risk levels associated with CSPs.
E. Identify common pharmaceuticals that are administered parenterally and describe the characteristics, stability, incompatibilities, and patient complications of sterile compounded parenterals.
F. Perform sterile compounding procedures to prepare various vial-based, and ampule based large-volume and small-volume parenteral preparations.
G. Prepare specialty admixtures such as narcotic preparations and pediatric CSPs.
H. Display appropriate technique in the compounding of a TPN preparation.
I. Identify common chemotherapy agents, their uses, and procedures for handling hazardous CSP materials (chemotherapy).
J. Exhibit excellent aseptic technique during process validation testing for compounding a variety of sterile products.

Course Content

A. Sterile compounding as a pharmacy technician
1. Roles and responsibilities of IV technicians
2. Effects of aseptic technique on patient health and safety
a. Patient complications related to compounding of sterile products
3. The United States Pharmacopeia (USP)
a. USP 797
4. Training and testing requirements
5. Process validation
6. Quality assurance
B. Sterile compounding supplies
1. Correcting opening and placement of supplies
2. Needles and specialty needles
3. Syringes
4. IV base solutions
5. IVPB solutions
6. Premixed parenteral products
7. Vials
8. Ampules
9. IPA swabs, vented dispensing pins, IVA seals and sharps containers
10. Sterile IV tubing
11. Repeater pumps
12. Miscellaneous sterile compounding supplies
C. Calculations for sterile compounding
1. Calculations as part of anteroom protocol
2. Dosage calculations
3. Special considerations
4. Basic formula calculations
5. IV flow rate and drip rate calculations
6. Calculation skills in the sterile compounding environment
D. Quality control
1. In-process tests and inspections of personnel performance, equipment, facilities and product
2. Risk level considerations for CSP
a. Immediate Use CSP risk level
b. Low Risk Level CSP with 12 hour or less BUD
c. Low Risk Level CSP
d. Medium Risk Level CSP
e. High Risk Level CSP
3. Documentation
4. Batch record requirements
E. Compounding sterile products
1. Products commonly used in parenteral preparations
2. Characteristics of sterile products
3. Particulate matter and prevention of particulate matter
4. Pyrogens
5. Incompatibilities affecting sterile products
6. Stability and other factors affecting sterile products
F. Parenteral preparations
1. Compounding large volume parenterals (LVP)
a. Essential supplies
b. Compounding procedure
2. Compounding small volume parenterals (IVPB)
a. Essential supplies
b. Compounding procedure
3. Ampule-based preparations

a. Properties of ampule medications
b. Administration of ampule based preparations
c. Compounding procedures
1) Opening of ampules
2) Contents of ampules
d. Essential supplies
4. Vial based reconstitution
a. Proper reconstitution procedure
G. Specialty admixtures
1. Narcotic preparations
a. Properties of narcotic CSPs
b. Patient controlled analgesia
c. Controlled substance storage and record keeping
d. Compounding narcotic CSPs
1) Essential supplies
2) Compounding procedure
2. Pediatric preparations
a. Pediatric CSPs
b. Pediatric dosing
c. Pediatric formulations
d. Administration of pediatric CSP
e. Compounding pediatric CSPs
1) Essential supplies
2) Compounding procedure
H. Sterile parenteral nutrition solutions
1. Types of parenteral nutrition
2. Indications for TPN
3. Formulation of TPN solutions
4. Administration of TPN solutions
5. Cleaning and calibration of the ACD
6. Premixed TPN solutions
7. Special considerations for preparing TPNs
8. Compounding of TPN solutions
a. Additives
1) Incompatibilities of additives
b. Nutritional requirements
c. Standard mixing protocols for TPN preparations
d. Labeling and storage
I. Chemotherapy products and procedures
1. Common chemotherapy drug categories
2. Properties of chemotherapy CSPs
3. Compounding of chemotherapy CSPs
4. Handling risks for chemotherapy
5. Training for chemotherapy preparers
6. Administration of chemotherapy CSPs
7. USP 797 guidelines for chemotherapy preparations
5. Hazardous drug spills
J. Process validation testing for the following CSPs
1. Large volume parenteral
2. Small volume parenteral
3. Additives to CSPs
a. Powder reconstitution
b. Ampules
4. Narcotic CSP
5. Pediatric dilution
6. TPN

Lab Content

A. Large volume CSP production, labeling, and documentation
B. Small volume CSP production, labeling, and documentation
C. Reconstitution of drug product
D. Ampule manipulation and transfer
E. Narcotic CSP (narcotic PCA syringe) production, labeling, and documentation
F. Pediatric special dilution production, labeling, and documentation
G. Adult parenteral nutrition preparation, labeling and documentation
H. Chemotherapy theory and demonstration

Special Facilities and/or Equipment

A. Laboratory supplied with water and electricity, laminar flow hood, materials necessary for aseptic preparation of parenteral products and hazardous substances, admixture pump, hazardous substances/sharps disposal equipment, hazardous substances spill kit, labels.
B. Textbooks, overhead, video tapes, multimedia cart, and charts.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Objective exams
Process validation checklists
Lab practical exams
Quizzes
Homework assignments

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

Lecture presentations and classroom discussion regarding topics
Small group recitation sessions to discuss concepts

Representative Text(s) and Other Materials

McCartney, Lisa. Sterile Compounding and Aseptic Technique: Concepts, Training and Assessment for Pharmacy Technicians, 2nd ed.. 2018.

Ballington, Don, and Robert Anderson. Pharmacy Practice for Technicians, 6th ed.. 2017.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

Self-evaluation of experiential competency

Discipline(s)

Pharmacy Technology