Macao Polytechnic Institute

School of Health Sciences and Sports

Bachelor of Science in Biomedical Technology

(Pharmacy Technology)

Module Outline

Academic Year 2020 / 2021 Semester 2

Learning Module	Basic Dispensing Techniques II (調劑學 II)			**Class Code**	BSDT1102
Pre-requisite(s)	Nil				
Medium of Instruction	English / Cantonese			**Credit**	4
Lecture Hours	26 hrs	**Lab/Practice Hours**	34 hrs	**Total Hours**	60 hrs
Instructor	Lao Cheng Kin, Chatmann		**E-mail**	cklao@ipm.edu.mo	
Office	Room M708, 7/F, Meng Tak Building, Main Campus		**Telephone**	8599-3473	

Description

During this 60-hour module, students learn sterile compounding and aseptic technique through a series of lectures and practical sessions. This module also provides students with a broad overview of various compounding services including reconstitution services of cytotoxic drugs and total parenteral nutrition.

Learning Outcomes

After completing the learning module, students will be able to:

1. Provide the rationale for aseptic technique and clean room design.
2. Perform basic sterile compounding using aseptic technique.
3. Perform mathematical calculations required for the usual dosage determinations and solution preparations in the compounding and dispensing of sterile drug products.
4. Recognize the risks of exposure to cytotoxic drugs.
5. Describe how to compound and handle cytotoxic drugs appropriately.
6. Explain the method of designing a parenteral nutrition order and demonstrate the related compounding technique.
7. Explain and demonstrate the method of extemporaneous compounding and dispensing for suppositories.

Content

1. Introduction to sterile compounding (2 hours)
    1.1 Pharmaceutical compounding
    1.2 Parenteral routes of administration
    1.3 Compatibility of sterile products
    1.4 Tonicity of sterile products
    1.5 Aseptic calculations

2. Practical session 1: Aseptic calculations (2 hours)

3. Sterile compounding areas (2 hours)
    3.1 Concept of clean room
    3.2 HEPA filter
    3.3 Design of a clean room
    3.4 Airflow hoods
    3.5 Cleaning the hoods and the clean room

4. Aseptic technique and preparation of sterile products (4.5 hours)
    4.1 Introduction to aseptic technique
    4.2 Proper gowning and hand washing
    4.3 Compounding supplies
    4.4 Manipulation using aseptic technique
    4.5 Special preparations
    4.6 Seals and closures
    4.7 Labeling
    4.8 Product verification
    4.9 Storage and beyond-use date
    4.10 Quality assurance

5. Practical session 2: Proper gowning and basics of aseptic technique I (2 hours)

6. Practical session 3: Basics of aseptic technique II (3 hours)

7. In-class activity: Aseptic technique errors and omissions (1 hour)

8. Safe handling and reconstitution of cytotoxic drugs (4.5 hours)
    8.1 Terminology in oncology
    8.2 Introduction to treatments of cancers
    8.3 Basic introduction to cytotoxic drugs
    8.4 Preparing and dispensing cytotoxic agents
    8.5 Personal contamination

8.6 Management of cytotoxic spills
8.7 Waste management
8.8 Handling non-injectable cytotoxic dosage forms

9. Practical session 4: One-on-one aseptic technique training (4 hours)

10. Practical session 5: Reconstitution of nonhazardous and hazardous drugs (3 hours)

11. Theory and reconstitution of parenteral nutrition (7 hours)
    11.1 Introduction and indications of parenteral nutrition
    11.2 Nutrition assessment
    11.3 Estimation of a patient's nutritional requirements
    11.4 Compatibility of parenteral nutrition
    11.5 Types of PN preparations
    11.6 Aseptic compounding of parenteral nutrition
    11.7 Administration of parenteral nutrition
    11.8 Monitoring and complications
    11.9 Special requirements for pediatric patients

12. Practical session 6: Adult total parenteral nutrition (4 hours)

13. Practical session 7: Neonatal total parenteral nutrition (3 hours)

14. Compounding suppositories (4 hours)
    14.1 What are suppositories?
    14.2 Routes of administration that utilize suppositories
    14.3 Suppository bases
    14.4 Compounding methods for suppositories
    14.5 Suppository molds
    14.6 Packaging of suppositories
    14.7 Prescription example 1
    14.8 Prescription example 2

15. Practical session 8: compounding suppositories I (4 hours)

16. Practical session 9: compounding suppositories II (4 hours)

17. Practical test (4 hours)

18. Final exam (2 hours)

Teaching Method

Lectures, videos, case studies, and practice

Attendance

Attendance requirements are governed by the "Academic Regulations Governing Bachelor's Degree Programmes of Macao Polytechnic Institute".

Assessment

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 being the passing score. Any students scoring less than 35% of the total mark in the final examination will be given an "F" grade for the module even if the overall grade is 50% or higher. Also, students will need to take the re-sit examination if they miss the final examination due to unreasonable absence and their maximum final score will be 50. Students are allowed to take final examination only if their attendance rate in practical sessions of this module is over 90%.

Note: Students who fail the practical test must receive further training and pass an additional assessment test in order to be eligible for the final exam. The original practical test grade will be used for calculation of overall module grade. The additional assessment test will be evaluated on a pass/ fail scale and will not be counted in the overall module grade.

	Item	Description	Percentage
1.	Practical reports		30%
2.	Practical test	Read the note above	35%
3.	Final exam		35%
		Total Percentage:	100%

Reference

Reference book(s)

- Johnston M. Sterile products and aseptic techniques. 2nd ed. Boston, MD: Pearson; 2011.
- American Society of Health-System Pharmacists. Basics of aseptic compounding technique. Bethesda, MD: ASHP; 2006.
- American Society of Health-System Pharmacists. Compounding sterile preparations – video training program companion workbook. Bethesda, MD: ASHP; 2005.
- International Society of Oncology Pharmacy Practioners Standards Committee. ISOPP standards of practice. Safe handling of cytotoxics. J Oncol Pharm Pract. 2007; 13 Suppl: 1-81.
- Mirtallo J, Canada T, Johnson D, et al. Safe practices for parenteral nutrition. *JPEN J Parenter Enteral Nutr.* 2004;28(6):S39-70.
- Elder DE. A practical guide to contemporary pharmacy practice. 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2017.