

Macao Polytechnic Institute

School of Health Sciences and Sports

Bachelor of Science in Biomedical Technology

(Medical Laboratory Technology and Pharmacy Technology)

Module Outline

Academic Year 2021 / 2022 Semester 2

Learning Module	Pathophysiology			Class Code	BSPP1102
Pre-requisite(s)	Nil				
Medium of Instruction	Cantonese & English			Credit	4
Lecture Hours	60 hrs	Lab/Practice Hours	0 hrs	Total Hours	60 hrs
Instructor	Meng Li Rong		E-mail	lrmeng@ipm.edu.mo	
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Description

Pathophysiology emphasizes on discussing the mechanism and law about occurrence, process, prognosis in diseases, which is a science laying particular stress on theory at some extent. Knowledge about normal configuration and function as well as metabolism in human body should be used in pathophysiology by comprehensive analysis to understand disease. So there exists a close relationship between pathophysiology and biology, genetics, anthropotomy, histology, physiology, biochemistry, biophysics, pathology, pharmacology, immunology, microbiology.

Learning Outcomes

This subject helps students master the common mechanisms and nature of disease processes, including the core features of body responses e.g. metabolism. This study offers rationales for devising prevention and treatment of diseases. After completing the course, students will be able to understand:

1. Medical students in basic pathophysiology courses will find that this subject makes a useful contribution to their understanding of how disordered physiology produces common diseases and syndromes.
2. They will understand a general ideas about diseases
3. They will comprehend how and why the symptoms and signs of various disease states

appear.

4. The fundamental pathologic progresses or typical pathologic progresses.
5. The pathophysiology about particular systems or organs.
6. To encourage and help the students to learn actively.

Content

1. Introduction (2 class hours)
 - 1.1 Concept of disease
 - 1.2 Disease etiology, pathogenesis and outcome
 - 1.3 Prevention of disease

2. Disorders of water and electrolyte metabolism (6 class hours)
 - 2.1 Disorders of water and sodium metabolism
 - 2.2 Disorders of Potassium metabolism
 - 2.3 Disorders of magnesium metabolism
 - 2.4 Disorders of Calcium and Phosphorus metabolism
 - 2.5 Edema
 - 2.6 Case analysis

3. Acid-base disturbances (4 class hours)
 - 3.1 Generation of acids and bases
 - 3.2 Regulation of pH
 - 3.3 Simple acid-base disorders
 - 3.4 Mixed acid-base disorders
 - 3.5 Case analysis

4. Hypoxia (4 class hours)
 - 4.1 Parameters of blood oxygen
 - 4.2 Classification, etiology and pathogenesis of hypoxia
 - 4.3 Alterations of function and metabolism
 - 4.4 Oxygen therapy and oxygen intoxication
 - 4.5 Case analysis

5. Fever (4 class hours)
 - 5.1 Regulation of normal body temperature
 - 5.2 Etiology and Pathogenesis
 - 5.3 Alterations of function and metabolism
 - 5.4 Pathophysiological basis of prevention and treatment
 - 5.5 Case analysis

6. Cellular signal transduction and disease (2 class hours)
 - 6.1 Major pathways for cell signalling
 - 6.2 Dysfunction of cell signalling in diseases
 - 6.3 Pathophysiological basis of prevention and treatment
 - 6.4 Case analysis

7. Apoptosis and disease (2 class hours)
 - 7.1 Inducer of apoptosis
 - 7.2 Effectors and regulators of apoptosis
 - 7.3 The biochemical pathways in apoptosis
 - 7.4 Abnormal cell apoptosis in diseases
 - 7.5 Case analysis

8. Stress (2 class hours)
 - 8.1 Terminology of stress
 - 8.2 Stress responses
 - 8.3 Functional and metabolic responses
 - 8.4 Stress-related diseases
 - 8.5 Pathophysiological basis of prevention and treatment for stress disorders
 - 8.6 Case analysis

9. Disseminated intravascular coagulation (4 class hours)
 - 9.1 Etiology and Pathogenesis
 - 9.2 Factors influencing the development of DIC
 - 9.3 Clinical classification of DIC
 - 9.4 Alterations of function and metabolism
 - 9.5 Pathophysiological basis of prevention and treatment

10. Ischemia-reperfusion injury (2 class hours)
 - 10.1 Etiology and Pathogenesis
 - 10.2 Alterations of function and metabolism during ischemia-reperfusion injury
 - 10.3 Pathophysiological basis of prevention and treatment for ischemia-reperfusion injury
 - 10.4 Case analysis

11. Shock (4 class hours)
 - 11.1 Etiology, pathogenesis and classification
 - 11.2 Alterations of function and metabolism
 - 11.3 Pathophysiological basis of shock prevention and treatment
 - 11.4 Multiple organs dysfunction syndrome (MODS)
 - 11.5 Case analysis

12. Respiratory insufficiency (4 class hours)
 - 12.1 Etiology and pathogenesis
 - 12.2 Acute respiratory failure and chronic respiratory failure
 - 12.3 Alterations of function and metabolism
 - 12.4 Pathophysiological basis of prevention and treatment
 - 12.5 Case analysis

13. Cardiac insufficiency (4 class hours)
 - 13.1 Etiology
 - 13.2 Classification and pathogenesis
 - 13.3 Compensatory and adaptive response
 - 13.4 Alterations of function and metabolism
 - 13.5 Pathophysiological basis of prevention and treatment
 - 13.6 Case analysis

14. Hepatic insufficiency (4 class hours)
 - 14.1 Etiology and pathogenesis for hepatic insufficiency
 - 14.2 Hepatic encephalopathy
 - 14.3 Hepatorenal syndrome
 - 14.4 Case analysis

15. Renal insufficiency (4 class hours)
 - 15.1 Basic tache of pathogenesis for renal insufficiency
 - 15.2 Acute and chronic renal failure
 - 15.3 Uremia
 - 15.4 Pathophysiological basis of prevention and treatment for CRF and uremia
 - 15.5 Case analysis

16. Pro-presentation

17. Middle term test (2 class hours)

18. Review (4 class hours)

19. Final Exam (2 class hours)

Teaching Method

Lectures, video, discussion and case studies

Attendance

Attendance requirements are governed by the “Academic Regulations Governing Bachelor’s degree programmes of Macao Polytechnic Institute”. Students are not eligible to attend the final examination and re-sit examination, moreover, an “F” will be given as the final grade to students who have less than the stated attendance for the enrolled subject.

Assessment

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 the pass 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.

	Item	Description	Percentage
1.	Middle term test	Closed book test	40 %
2.	Final exam	Closed book examination	60 %
		Total Percentage:	100 %

Teaching Material(s)

TextBooks

王建枝、金惠銘（編）（2005）*Pathophysiology*（第1版）。北京：人民衛生。
金惠銘、王建枝（編）（2018）*病理生理學*（第9版）。北京：人民衛生。

Reference Books

McPhee , S. J., [Lingappa, V. R., & Ganong, W. F.](#) (2004). *Pathophysiology of disease.*(3rd ed.). New York: McGraw-Hill.
謝可鳴，王小川. 病理生理學復習與自測. (2008). 北京：人民衛生出版社