Syllabus of _____ Pathophysiology _____Experiments
Shandong University School of Basic Medical Science

Writers: Xue Bing, Wang Jinali, Wang Jingjing

Time:

1. Basic information of the course

Course Name	Pathophysiology Experiments				
Course Code					
Teaching Department	Pathophysiology				
Experiment Type	√Professional basic experiment □Professional experiment □Comprehensive experiment □Innovative experiment □Open experiment				
Course Type	√ Compulsory □Elective				
Experimental Type	□Independent course √ Non-independent course				
For Which Major					
Credits		Lecture Hours	66	Experiment Hours	16
Prerequisite course	Physiology				
Website of the course					

2. Course Description

Laboratory studies in pathophysiology focus on the pathophysiological processes. It provides a strong support for the teaching of pathophysiology theory, and requires students to master basic animal experimental skills and observe the effects of pathological processes on the body, as well as the treatment principles. The completion of the course will strengthen the understanding and memory of the theoretical knowledge of pathophysiology. Trainings on problem-solving abilities in a laboratory are a focus of this course.

3. Course character and teaching objective

【Teaching objectives】

Pathophysiology focuses on the abnormal changes of body function and structure under different pathological conditions. The purpose of the course is to establish the pathological models with experimental animals , and then help students to observe and understand the effects of pathological processes on the body. On the other hand, the course also focuses on cultivating students' consciousness of caring for experimental animals and strictly abiding by animal experimental ethics. Case discussion is helpful to strengthen the students' clinical thinking ability.

【Teaching requirements】

1. Train the students’ practical ability.
2. Cultivating the Ability to use Knowledge solving Problems.
3. Strengthening the ethical concepts of laboratory animals.
4. Training the students’ clinical thinking.

4. Teaching content and teaching hour allocation

Experiment 1 Title: _Acute Asphyxia (4 credit hours)

【Teaching objectives and requirements】

1. To observe the effects of airway's different degree obstruction on respiration

2. To learn how to record and observe respiratory movement.

【Main instruments and medicines】

1. Animal: rabbit

2. Apparatus: operating table for rabbit, vascular clamp, holding forceps, trachea cannula (Y shape, one terminal is closed, another is connect to a rubber tube); Syringe (20ml), gloves, container, cotton ball; Power Lab system-420.

3. Reagent: 20% urethane, 0.2% heparin, procaine

【Experimental requirements】

1. Students need to master the skill of capturing rabbit and tracheotomy and record the curve of respiratory movement.

2. Students need to know that asphyxia effects on heart and blood pressure.

Experiment 2 Title: Stagnant Edema (4 credit hours)

【Teaching objectives and requirements】

1. Comprehend better the significance of increased CHP and obstruction of lymphatic return in the development of local edema.

2. Learn how to catch, fix and anaesthetize rat.

3. Learn how to isolate femoral vein.

【Main instruments and medicines】

1. Animal: rat

2. Apparatus: gloves, container, cotton ball, suture needle, suture thread, vascular clamp, holding forceps, thick string, ruler, operating table for rat.

3. Reagent: isoflurane, chloral hydrate 0.3-0.4mg/100g.

【Experimental requirements】

1. Students need to master the skill of capturing rats and separate femoral vein.

2. Students are able to model stagnant edema and correctly measure circumference of leg.

Experiment 3 Title: **Effects of hyperkalemia on the heart (4 credit hours)**

【Teaching objectives and requirements】

1. Observe the effects of hyperkalemia on the ECG.
2. Learn about the basic treatment principle of hyperkalemia.

【Main instruments and medicines】

1. Animal: rabbit
2. Apparatus: A set of instruments, a set of transfusion intravenous apparatus, operating table, ECG lead, injector(1ml、2ml、5ml、10ml、20 ml), Power lab system
3. Reagent: 20％urethane, 3% KCl, 5% $NaHCO_3$, 5%$CaCl_2$, 50% glucose, insulin.

【Experimental requirements】

1. Students need to master the skill to record the ECG and could explain the ECG.
2. Grasp the effect of hyperkalemia on the ECG.

Experiment 4 Title: _Acute ammonia intoxication (4 credit hours)

【Teaching objectives and requirements】

1. Comprehend better the detoxifcation effect of liver and the ammonia intoxication hypothesis.
2. Learn how to catch, fix and anaesthetize rabbit.
3. Learn how to isolate and ligate the liver.

【Main instruments and medicines】

1. Animal: rabbit
2. Apparatus: operating table for rabbit, vascular clamp, holding forceps, trachea cannula (Y shape, one terminal is closed, another is connected to a rubber tube); Syringe (20ml), gloves, container, cotton ball.
3. Reagent: 20% urethane, 5% ammonium chloride, 5% sodium chloride

【Experimental requirements】

1. Students need to master the skill of capturing rabbit and isolate and ligate the liver.

2. Students need to know the ammonia plays a role in the pathogenesis of hepatic encephalopathy.

4. Annual update of the experimental projects

5. The corresponding relationship of experimental teaching

	1.Practical Ability	2.The ability to use knowledge to analyze phenomena	3.Strengthen the ethical concept of experimental animal	4.Cultivating clinical thinking ability	
Acute Asphyxia	X	X	X		
Stagnant Edema	X	X	X		
Effects of hyperkalemia on the heart	X	X	X		
Acute ammonia intoxication	X	X	X		

6. Assessment and evaluation methods

【Examination contents】

Experimental operation and report

【Achievement evaluation】

Experimental reports (90%) ; attendance（10%）.

7. Textbooks and bibliography

【Textbooks】

Pathophysiology of Disease: An Introduction to Clinical Medicine. Edited by Gary D. Hammer, MD, PhD and Stephen J. McPhee, MD

【Bibliography】