Introduction to Pathophysiology

Course
Pathophysiology

Unit I
History, Current Trends and Future

Essential Question
What are the different careers related to clinical pathology?

TEKS
§130.208 (c) (2) (E)

Prior Student Learning
None

Estimated time
3-4 hours

Rationale
The studies and tests performed in pathophysiology play an important role in diagnosing and treating disease.

Objectives
Upon completion of this lesson, the student will be able to:

- Evaluate information about careers in pathophysiology
- Correlate the relationship of pathology to the field of healthcare

Engage
Have students discuss the process of taking biological tissues for a biopsy. Next have the students discuss all the professional roles that are involved in the diagnosing and treatment of this patient.

Key Points

I. Pathophysiology involves the study of functions that result from disease processes.
   A. What is pathology? Pathology is the branch of medical science that treats the essential nature of disease, especially the changes of structure and function in tissues and organs of the body that cause or are caused by disease.
   B. Why is pathophysiology studied? In the clinical setting, pathologists, histotechnologists, and cytotechnologist study tissues and cells to establish the cause of diseases. Physicians use that information to form a treatment plan.

II. Careers in Pathophysiology
   A. What is a pathologist? A pathologist is a physician who is specifically trained and experienced in anatomical and physiological pathology.
   B. What is a histologic technician or histotechnologist?
      1. Histologic technicians and histotechnologists prepare slides of body tissue for microscopic examination.
      2. Career opportunities for both are excellent in hospitals, research institutions, industrial labs, and government agencies.
      3. A technician requires a 12-month, hospital-based, on-the-job training program or an AAS degree.
      4. A histotechnologist requires a BS degree and one year of additional laboratory experience.

   C. What types of studies are performed in the clinical pathology

laboratory?

1. Gross Exam
    a. Tissues of all types are sent to the histology department for studies into the disease process.
    b. The pathologist studies the tissues by performing a gross examination.
    c. Tissues are looked at closely and all observations are recorded.
    d. Each tissue is then prepared for microscopic studies by placing it in a tissue cassette.
2. Microscopic Exam
    a. Tissues are prepared by the histotechnologist.
        i. This is done by using the embedding center. The tissue is placed in paraffin wax in order to cut thin slices of it.
        ii. The histotechnologist pours paraffin wax over a tissue specimen.
        iii. Once the tissue is embedded in paraffin, the block of wax is cooled. The histotechnologist then cuts ribbon-like sections for placement on slides. The instrument used is called a microtome.
        iv. A water bath is used for spreading the paraffin ribbons, and sections are placed on microscope slides to be stained.
        v. Tissues are stained at the staining center. The basic stain for all tissues is the Hematoxylin and Eosin (counterstain) stain.
        vi. Special stains are used for particular details. They include
            - AFB – Acid Fast Bacilli Stain
            - PAS – Periodic Acid Schiff Stain
            - Trichrome Stain
            - Iron Stain
    b. The pathologist then studies the slide to determine pathological states within the tissues.
        i. A written report is then given to physician to aid him or her in the diagnosis and treatment of the client.
        ii. Pathologists also perform frozen sections for clients in surgery on the Cryostat.

D. Exciting opportunities await students who want to explore the physiology of tissues and cells under the microscope!

Activity

I. Research pathophysiology career information, including where the programs are offered in the state, admission requirements, and the occupational outlook. Present the findings to the class. See the activity sheet.

Assessment

Oral Presentation Rubric

Materials

Introduction to Pathophysiology PowerPoint Presentation

www.texashotjobs.org

Accommodations for Learning Differences

For reinforcement, the student will define the following terms:

- pathophysiology
- pathologist
- histotechnologist.

For enrichment, the student will visit a local pathology laboratory and report on the technology used in the facility.

National and State Education Standards

National Healthcare Foundation Standards and Accountability Criteria:

Foundation Standard 4: Employability Skills

4.3 Career Decision-making

4.31 Discuss levels of education, credentialing requirements, and employment trends in healthcare.

4.32 Compare careers within the health science career pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

TEKS

§130.208 (c) (2)The student uses scientific methods and equipment during laboratory and field investigations. The student is expected to

(E) Plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology.

Texas College and Career Readiness Standards

English and Language Arts

I. Writing

A. 2. Generate ideas and gather information relevant to the topic and purpose, keeping careful records of outside sources.

II. Reading

A. 11. Identify, analyze, and evaluate similarities and differences in how multiple texts present information, argue a position, or relate a theme.

Pathophysiology Career Investigation

Name of the Career –

What are the college degree(s) you must have to achieve this career goal?

How many years of college does it take to earn the degree(s)?

What college(s) can you attend locally to achieve or begin to achieve this career goal?

Name 3 activities of interest to you that someone in this career does on a regular basis.

Name 3 skills you need to be successful in this career.

Which skill do you believe is the most important?

Why?

Name 3 traits you have that would make this career a good fit for you.

What is the average annual pay for a career like this?

Name 3 careers that go hand-in-hand with the one you have selected

Is this career growing in the U.S.?

Based on what you discovered about this career, is it still one you think you would like to pursue?

Why?

Oral Presentation Rubric

Student: _____ Date: _____

Scoring criteria	4. Excellent	3. Good	2. Needs Some Improvement	1. Needs Much Improvement	N/A
Clearly and effectively communicates the main idea or theme.					
Presenter is self-confident and clearly expresses ideas.					
Presenter answers questions with well thought out responses.					
Holds audience attention and maintains eye contact.					
Visual aids are clear and add to the presentation.					

NOTE: N/A represents a response to the performance which is "not appropriate."