

Lecture Objectives and Interactive Exercises

Aging Organ Systems Curriculum – Second Year Students

1. Aging and the Nervous System

Objectives:

- 1 - Distinguish the concepts of normal aging, age-related physiological changes, and age-related disease in the nervous system
- 2 - Give examples of physiologic heterogeneity as it relates to changes in the nervous system in older adults
- 3 - Describe changes in physiology and anatomy affecting the nervous system with age
- 4 - List expected clinical changes observed in cognition, motor function, and important sensory functions with age
- 5 - List potential lifestyle strategies to promote healthy aging of the nervous system
- 6 - Describe methodological challenges in studying aging physiology, particularly as applied to the nervous system

Interactive Student Response System Questions:

Facts on Aging Pretest: True or False?

- As people grow older, their intelligence declines significantly.
- The cognitive function most affected by age is short-term recall.
- Time to hit the brake pedal in response to sudden stopping of traffic increases with age.
- All neurological and cognitive functions decline with age.

2. Aging and the Musculoskeletal System

Objectives:

1. Describe the major changes that occur in tendons/ligaments, intervertebral discs, cartilage and muscle with aging, and provide clinical correlates
2. Discuss examples of the consequences of aging of the immune system and changes that occur in drug disposition with aging
3. Summarize how aging affects the presentation of gout, myopathies, rheumatoid arthritis and SLE

3. Aging and the Endocrine System

Objectives:

- 1 - On the basis of this lecture and other study material, the student should be able to describe the age-related changes that occur in:
 - Glucose metabolism
 - Thyroid function
 - Gonadal function

Adrenal function
Growth hormone secretion

- 2 - On the basis of this lecture and other study material, the student should be able to discuss the relative advantages and disadvantages in initiating therapy for the age-related changes in:
- Glucose metabolism
 - Thyroid function
 - Gonadal function
 - Adrenal function
 - Growth hormone secretion

Case: - Ted Williams

You are an endocrinologist at WFU. One Sunday afternoon, you receive a phone call from a colleague at the University of Florida, Dr. Richard Kerensky. Dr. Kerensky is a cardiologist who is the attending physician for baseball legend Ted Williams (known for his aggressiveness, and the last player to hit .400 in the major leagues). Mr. Williams, who is in his 80's has chronic heart failure and he is bedridden, debilitated, weak, listless, and going down hill rapidly. Dr. Kerensky has been confronted by Mr. Williams' son, who requests that his father be treated with growth hormone, based on research he has found that indicates that GH levels are low in the elderly, and that GH deficiency can be associated with generalized weakness, poor stamina, and debility. What would you recommend?

4. Aging and the Gastrointestinal System

Objectives

1. To determine whether physiological changes in the motility, secretory and absorptive functions of the GI/Hepato –Biliary- Pancreatic tract contribute to symptoms in the elderly.
2. To determine whether non GI conditions may induce GI symptoms in the elderly.
3. To determine whether common GI conditions behave differently in the young and the elderly.
4. To determine whether the management of these conditions should be different in elderly patients

5. Aging and the Hematologic System/Cancer Treatment

Objectives:

- 1 Describe the impact of aging on hematopoiesis as it relates to bone marrow function and peripheral blood counts.
- 2 Describe the clinical consequences of anemia in the elderly.
- 3 Define the relationship between age and risk of malignancy.
- 4 Identify theories of carcinogenesis related to aging.
- 5 Identify factors that influence cancer morbidity and mortality in the elderly.
- 6 Recognize the role of aggressive therapy in selected elderly cancer patients.
- 7 Identify treatment outcomes relevant to the elderly population.
- 8 Define and apply the concept of geriatric assessment as it pertains to elderly cancer patients.

9 Describe treatment guidelines designed to minimize toxicity for older adults receiving chemotherapy.

Case:

- Mr. P is a 79 year old who presented with low grade fevers and enlarging submandibular mass
- Biopsy revealed malignant Non-Hodgkin's lymphoma-large cell type
- Diagnosis – limited stage malignant NHL

What is the appropriate therapy for Mr. P?

- Does age play a role in your treatment decisions?
- Should age play a role in your treatment decisions?

6. Aging and the Renal System

Objectives:

1. Describe the structural and functional changes in the kidney which accompany aging
2. Describe acute and chronic kidney disease in the elderly
3. Recognize the impact of co-morbid conditions on the outcome of elderly patients with CKD
4. Be familiar with the secondary complications of reduced GFR in elderly patients
5. Describe the options for renal replacement therapy in the elderly

7. Aging and Cardiovascular Disease

Objectives:

1. To learn about cardiovascular disease in the elderly.
2. Understand the hemodynamic determinants of specific symptoms in valvular heart disease
3. Know the natural history of the most common valvular diseases
4. Be able to predict the specific valve lesion from the patients history and physical exam

Case:

History: Mr. Brisbain is a 78 year old man who presents at the emergency room with no syncope. This occurred with exertion and was preceded by a brief episode of substernal chest pain and dyspnea. He has not had a fainting spell before. He noted the exertional chest pain and dyspnea for the first time ever about six months ago. He has no previous cardiac history and has no risk factors for coronary artery disease other than age and gender.

Physical exam: Pleasant and alert older man. Blood pressure 160/90 in both arms in the seated position. Heart rate 80 and regular. Lung fields are clear to auscultation and percussion. Cardiac examination shows a regular rhythm. There is a III/VI harsh murmur heard at the left sternal border with a slight honking quality that is faintly heard in both carotid arteries as well. The first heart sound is normal, and the second heart sound is only faintly heard. The carotid pulses feel dampened.

The peripheral vascular examination is otherwise unremarkable. The abdomen is soft and nontender. There is no pedal edema.

EKG: Normal sinus rhythm, left ventricular hypertrophy with strain pattern.

Chest x-ray: Mild cardiomegaly.

8. Aging and the Pulmonary System

Objectives:

1. Describe changes in pulmonary physiology occurring with age
2. Discuss changes in pulmonary function tests over the lifespan
3. List expected changes in the arterial blood gas with age
4. Explain the impact of age on diseases of the lungs and their treatment

9. Aging and the Immune System

Objectives:

1. Define differences in immune responses of old vs. young adults.
2. Distinguish major differences in the presentation of older adults with infection vs. that of young adults.
3. Assess the accuracy of prognostic scoring systems for use in older adults.
4. Translate issues of geriatric care into management strategies for selected infections in older adults (pneumonia, prosthetic joint infection, FUO).
5. Define efficacious measures to prevent pneumonia in older adults.

10. Aging and the Integument

Objectives:

For the skin of elderly patients, after completion of this program, you should be able to:

- Identify and treat common inflammatory skin disorders
- Identify and treat psoriasis
- Identify and treat fungal disorders
- Identify skin cancers