CARROLL UNIVERSITY
PHYSICIAN ASSISTANT PROGRAM

PHA 510: CLINICAL DIAGNOSTICS II
Syllabus – Spring 2017

Course Number: PHA 510

Course Title: Clinical Diagnostics II

Number of Credits: 2 Credit Hours

Day/Time: Monday 8:00-9:50 a.m. or AS POSTED

Prerequisites: Successful completion of PHA 509

Faculty: Course Director: Hannah Pincsak, MSPAS, PA-C
Office hours: By appointment
Telephone: 262-352-5266
Email: hpincsak@carrollu.edu

Course Description:
This two part course builds upon the information presented in PHA 509. Using a variety of teaching methods, it will give students the ability to appropriately select and interpret the results of basic clinical laboratory and imaging diagnostic tests and procedures essential to the physician assistant's role and responsibilities in formulating a preliminary diagnosis and management plan. Students will emerge with an understanding of the indications for various modalities and the significance of abnormal test results.

Course Content:
This course is designed to help prepare the physician assistant for entry level practice by providing them with the ability to select and interpret the appropriate basic laboratory and radiologic diagnostic tests. Class time will include the lecture learner format in each specific content area, but will also include case studies demonstrating the relationship of multiple diagnostic categories in formulating a differential diagnosis and treatment plan. Content will closely follow topics covered in Clinical Medicine II (PHA 506) and Clinical Decision Making (PHA 522) and will focus on the diagnostics associated with disease states and case studies as presented in PHA 506 and PHA 522. Information will be presented by PA program core faculty and guest lecturers.

The specific learning objectives for this course are to be used as a guide for reading, studying, and preparing for the course examinations. Students are expected to be independent, self-directed learners. Students are responsible for reading assignments and internet based assignments outside of scheduled class time.

Student Expectations

- demonstrates a positive attitude toward learning
- is on time for all scheduled classes, including timely return from breaks
- completes readings and assignments prior to class
- asks relevant and understandable questions
- takes full responsibility for learning and self-directed learning activities
- shows respect for self, other students, and faculty
- refrains from revealing negative feelings through tone of voice or body language
• refrains from disruptive activities during class including eating, talking, getting up and down, use of cell phone, etc.
• relies on personal resources before approaching others for help
• demonstrates cooperation with and mutual respect for peers
• responds to faculty, staff and peers readily and appropriately

Instructor Expectations

• demonstrates a positive attitude towards the facilitation of learning
• is on time for all scheduled classes
• should the need arise, reschedules class time with appropriate and timely notification to students, faculty, and staff
• provides appropriate course materials for class preparation prior to class
• is available for office hours or appointments to assist with questions; responds to faculty, staff, and students readily and appropriately
• listens attentively and initiates communication which is appropriate and timely
• identifies limitations in knowledge and provides appropriate resources for student learning
• provides timely and constructive feedback for assignments and assessments
• shows respect for self, students, and other faculty
• refrains from revealing negative feelings through tone of voice or body language
• demonstrates cooperation with and mutual respect for students, faculty, and staff

Required Texts and Resources:

Learning Radiology, Recognizing the Basics, William Herring, 3rd Edition

Grading:
The course grade for the spring semester will be based upon the following:

Exam 1: 100 points
Exam 2: 100 points
Exam 3: 100 points
TOTAL: 300 points

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Attendance and Professionalism

Attendance at all class periods, laboratories, and practical experiences are mandatory unless otherwise indicated. Poor attendance (unexcused absences, tardiness, and unauthorized early departures), lack of preparation, and unprofessional behavior may result in a lower or failing grade and/or be reported to the program progression committee. If you will be absent, tardy, or need to be excused early you must notify the course director via e-mail or phone prior to the scheduled meeting time. Tardiness and unauthorized early departures will be considered unexcused absences unless prior notification is submitted. Unexcused
Absences of more than 10% of class time may result in a failing grade. Absences are excused only at the discretion of the course director and/or the PA Program Director. Students may be required to make up missed laboratory time (excused or unexcused) at the discretion of the course director.

**Examinations**

There will be 3 exams during the semester. Please refer to the schedule for details. Exams are multiple choice exams and are closed-book. Challenges to examination questions will be accepted for 1 week after the return of scores. Challenges must be submitted in writing via email with two written sources, at least one from recommended course readings.

No books, papers, notebooks, cellphones, smartphones, I-pods, I-pads, blackberry, etc. or backpacks/book bags will be allowed on/near your desk during an examination. Recommend keeping personal belongings in the back of the room or in lockers. **Hats** are prohibited during an exam. Cellphones, smartphones, I-pods, I-pads, blackberry, etc. must be turned off during an examination.

**Assignments**

Assignments will be required and will be outlined on the LMS course site.

**Statement on Academic Integrity**

The Carroll University Academic Integrity Policy is located in the Carroll University Student Handbook. Students are encouraged to familiarize themselves with it. If a student violates this policy in any way, the instructor(s) reserve the right to impose a sanction of failure on the assignment/assessment or failure in the course. If you have questions about appropriate citations, please ask your instructor.

**Accommodation for Disabilities**

Any requests for accommodation for physical or cognitive disability must be made through the Walter Young Disability Services Coordinator at Carroll University. Appropriate accommodations will be evaluated based on the program technical standards once notification has been received from the Walter Young coordinator. If an individual student has special needs or concerns about course requirements related to religious beliefs, cultural issues, or other issues, the student must contact the Program Director with a request for accommodation.

**Modifications to the syllabus**

The instructor and the University reserves the rights to modify, amend, or change the syllabus (schedule, course requirements, grading policy, etc.) as the curriculum and/or program require(s).

**Remediation**

Students who receive a D or an F in this or any physician assistant year 1 course will be placed on academic probation.

During the course, a student who scores more than 2 SD below the mean on an exam/assessment may be required to complete additional work. The student will be contacted by the course instructor and asked to meet to discuss the remediation requirements for that particular assessment. Remediation requirements will be determined by the course instructor. When an instructor requires remediation of a student it does not affect the exam/assessment grade, nor does it improve the semester or course grade. Remediation is
required to ensure that course objectives are met. It is expected that assigned work for the purpose of remediation be completed in a thorough, professional and timely manner. Satisfactory completion of remediated work will be determined by the course instructor. Students may be required to complete additional work if the original remediation is deemed unsatisfactory.

Students should make every effort to resolve remediation issues with the course director. If a student is unable to resolve such issues s/he may request a review by the Didactic Subcommittee. All decisions made by the subcommittee are final. If remediation is not successfully completed by the end of the course/semester a grade of "Incomplete" will be given until the work is successfully completed. Please note that an incomplete course grade may delay program progression and/or graduation. Information regarding incomplete grades is available in the Graduate Catalog.

**Course Goals:**
This course will help prepare physician assistants students for entry level clinical practice by:
1. Providing them with the skills necessary to formulate a preliminary differential diagnosis for a patient given a specific case scenario/presentation.
2. Demonstrating how to determine which diagnostic tests to order based upon a patient’s clinical presentation, risk vs benefit, cost, availability and turn-around time.
3. Providing the foundation necessary to correctly interpret the results of basic laboratory, radiologic diagnostic tests.

**Learning Outcomes:**
Upon successful completion of this course, the student should be able to:
1. Describe basic laboratory and radiology diagnostic tests.
2. Distinguish between diagnostic terms such as “gold standard”, “initial”, “least invasive”, “most cost effective” and “best” in determining which diagnostic test to order based upon a patient’s clinical presentation.
3. Explain positive predictive value, specificity and sensitivity as pertinent to diagnostic testing.
4. Formulate a preliminary differential diagnosis based upon clinical presentation.
5. Evaluate and triage the need for a diagnostic test based upon a patient’s clinical presentation.
6. Choose the most appropriate diagnostic test based upon clinical presentation, cost, risk, availability and turn-around time.
7. Interpret and evaluate diagnostic test results correctly.
8. Be familiar with risks and benefits of invasive diagnostic tests.
9. Evaluate the significance of abnormal results.
10. Distinguish between false positive and false negative results.
11. Practice cost-effective health care and resource allocation that does not compromise quality of care.
12. Apply medical information and clinical data systems to provide more effective, efficient patient care.

**Learning Objectives By Section:**
At the conclusion of the course, the PA student will be able to:

**Radiology:**
**Musculoskeletal imaging**
1. Understand the importance of mechanism of injury
2. Know that in trauma, plain film would be done before any other modality
3. Know that a minimum of two views needed
4. Know when to order MRI or CT as next test
5. Fractures to recognize:
   a. C1, C2, C5-C6-C7
b. L1-L2  
c. Clavicular  
d. Scapular fx (know to do CXR to r/o pneumothorax)  
e. Supracondylar fx of humerus/radial head fracture (sail sign/fat pad sign)  
f. Know that radial n. & a. injury is most common with this fx  
g. Monteaggia fx  
h. Colle’s & Smith’s fx  
i. Boxer’s fx  
j. Scaphoid/navicular fx (repeat film or bone scan if first film is neg)  
k. Pelvic fx (know bladder injury is common)  
l. Uni-, bi-, tri-malleolar ankle fx  
m. Jones fracture  
n. Maisonneuve fracture (distal tib fx with (often missed) prox fib fx)  
o. Other: abdominal Series  
  i. Know the anatomic landmarks on a typical KUB  
  ii. Know the indications for a KUB/upright, and when other imaging modalities are better  
  iii. Know the anatomic difference (on film) between small bowel and colon  
  iv. Recognize SBO on a plain film and upright (air-fluid levels)  
  v. Be able to differentiate SBO from adynamic ileus (in a radiology report text)  

**Pediatric Radiology**  
1. Know Salter-Harris classification of fractures.  
2. Know when to obtain and how to interpret soft tissue lateral neck films  
3. Know that expiratory films may be useful when suspected foreign body aspiration  

**Neuroradiology**  
1. Recognize the utility and deficiencies of plain films of the skull  
2. Know when appropriate to order CT (when is contrast needed)  
3. Know when more appropriate to order MRI  
4. Understand the utility and special views needed for plain film of the sinuses  
5. Recognize on CT the differences between a subdural and epidural hematoma  

**CT vs. MRI vs. U/S vs. Plain films**  
Select the BEST imaging modality for the following suspected pathologies:  
1. CHF  
2. Pneumothorax  
3. Pneumonia  
4. Perforated ulcer  
5. SBO  
6. Foreign body in the trachea  
7. Nephrolithiasis  
8. Aortic aneurysm (acute rupture)  
9. Stable aortic aneurysm (follow-up)  
10. Ectopic pregnancy  
11. Ligamentous knee injury  
12. Inflammatory bowel disease  
13. Subarachnoid hemorrhage  
14. Pleural effusion  
15. Osteomyelitis  

**Miscellaneous:**  
Have a basic understanding of the indications for and the interpretation of the following:  
1. PET scanning  
2. IVP  
3. Fluoroscopy  
4. Barium studies of the GI tract
5. Nuclear medicine scanning  
6. Vascular interventional imaging and diagnosis  
7. CT with or without contrast  
8. MR with or without contrast  
9. DSA  
10. Ultrasound

**Laboratory Section:**

**Rheumatology**
1. List the role/rationale for the use of the following tests in the evaluation of suspected arthritis: CBC, erythrocyte sedimentation rate (ESR), CRP, uric acid, serum protein electrophoresis, immunoglobulins, rheumatoid factor (RF), antinuclear antibodies (ANA), serum complement, ANCA, HLA-B27, cryoglobulins, and ASO titers.
2. Differentiate the findings of joint fluid analysis for non-inflammatory, inflammatory, and septic arthritis, gout and pseudogout.
3. Discuss the significance/use of the SLE prep in the evaluation of rheumatologic disorders.
4. Discuss the use of the ANA titer when evaluating for suspected SLE.

**Neurology**
1. Apply principles of fluid analysis to CSF fluid obtained from an LP.
2. Order appropriate lab testing on CSF fluid.
3. Understand the limitations of CBC/differential in evaluating a patient who may have a CNS infection.

**Endocrinology**
1. Diabetes Mellitus  
   a. Identify the appropriate lab tests and criteria for the diagnosis if Diabetes Mellitus and the affects of fasting on these tests.  
   b. Recognize medications that may affect glucose levels and give a false positive result.  
   c. Identify when antibody testing is indicated for Diabetes Mellitus.  
   d. Review the role of glycosylated hemoglobin testing and apply it to a clinical case.
2. Thyroid  
   a. Review and apply an algorithmic diagnostic approach to hyperthyroidism and treatment monitoring.  
   b. Review and apply an algorithmic diagnostic approach to hypothyroidism and treatment monitoring.  
   c. Outline the laboratory findings associated with thyroiditis.  
   d. Outline the diagnostic evaluation of thyroid nodules.
3. Adrenal  
   a. Review and apply an algorithmic diagnostic approach to Cushing's Syndrome  
   b. Review and apply an algorithmic diagnostic approach to Adrenal Insufficiency
4. List the lab tests used to confirm a diagnosis of acromegaly.
5. Pituitary  
   a. Recognize the diagnostic tests used to evaluate for pituitary adenomas and neoplasms
6. Parathyroid/calcium  
   a. Review and apply an algorithmic diagnostic approach to hyperparathyroidism  
   b. Review and apply an algorithmic diagnostic approach to hypoparathyroidism
7. Recognize the appropriate clinical scenario and labs needed to suspect/confirm a diagnosis of Diabetes insipidus

**Nephrology/Urology**
1. List the expected and abnormal findings (and their significance) for the chemical analysis of the urine.
2. Recognize the expected, and unexpected, urine sediments associated with renal/urinary tract diseases.
3. List the likely causes of urine color changes, both in healthy patients, and those with acute and chronic renal disease.
4. Identify the significance/etiology of the various urinary casts in both health and renal disease.
5. Outline the laboratory findings associated with cystitis and pyelonephritis (serum and urine).
6. Delineate the causes of proteinuria, and the appropriate evaluation of patients with significant proteinuria.
7. Understand the role of a 24-hour urine collection in evaluating renal abnormalities; interpret 24-hour urine results in narrowing a broad differential diagnosis for a particular patient presentation.
8. Outline the characteristics (indications, advantages, limitations) of the labs/measures of renal function.
9. Delineate the causes, and clinical presentation of, electrolyte disturbances (hyper and hypo), including sodium, potassium, magnesium, calcium.
10. Match the signs and symptoms associated with abnormalities of the electrolytes.
11. Describe the conditions or factors that are associated with "pseudo" elevations (or reductions) of the serum electrolytes.
12. Recognize pre-renal azotemia and its most likely etiologies. Order appropriate testing in the patient presenting with an acute prerenal azotemia.
13. Identify the clinical settings in which the following laboratory tests would be useful: Urine to Plasma Creatinine Ratio, Fraction Excreted Sodium, and Renal Function Index.
14. Outline the relationship/correlation of the serum creatinine (Cr) and the Creatinine Clearance (CrCl) as related to the assessment of renal function.
15. Define GFR, and delineate its use in the assessment and management of renal disease.
16. Recognize the serum and urine lab findings for patients with end-stage renal disease, and other acute and chronic renal/urinary diseases (as discussed in Clinical Medicine and Laboratory Medicine).
17. Delineate the etiologies of both symptomatic and asymptomatic hematuria, and outline the evaluation strategies for further evaluation of the patient with hematuria.
18. Analyze PSA results; know what commonly causes false elevations; understand when PSA velocity and Free to Total ratios are useful in analyzing a borderline PSA result.

**Infectious Disease Testing:**
1. Be familiar with aseptic technique when obtaining samples for analysis.
2. Explain the terms "culture and sensitivity."
3. Interpret a basic sensitivity panel.
4. Recognize the signs and symptoms of sepsis.
5. List the causes of septicemia and septic shock.
6. Recognize the clinical indications for obtaining blood cultures.
7. Understand the role serial sampling plays in the accuracy of blood culture results.
8. Know the indications and proper technique for obtaining a clean catch urine.
9. Know the indications for obtaining stool studies for enteric pathogens, ova and parasite.
10. Know the methodology behind testing for giardiasis and cryptosporidium.
11. Be familiar with testing for Clostridium difficile infection.
12. Know the indications and proper technique for wound culture.
13. Know why, how and when to order testing for beta hemolytic strep group B in mother and newborn.
14. Be familiar with STD testing in male and female patients.
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<th>Date</th>
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<td>Jan 30</td>
<td>Musculoskeletal Radiology</td>
<td>Hannah Pincsak</td>
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<tr>
<td>Feb 6</td>
<td>Fractures/Dislocations</td>
<td>Hannah Pincsak</td>
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<td>Feb 13</td>
<td>Pediatric Radiology</td>
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<td>Feb 20</td>
<td>Rheumatology</td>
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<td>March 6</td>
<td>Neuro/Neuroradiology</td>
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<td>Endocrinology</td>
<td>Jessica Grusnick</td>
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<td>The week of April 3</td>
<td>Nephrology/Urology</td>
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