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**From the Clinic to the Classroom: Nurse Practitioner to Nurse Practitioner**

Julee Waldrop, DNP, FNP-BC, PNP, CNE  
Diane Wink EdD, FNP-BC, ARNP  
Christopher W. Blackwell, Ph.D., ARNP, ANP-BC, CNE  
College of Nursing  
University of Central Florida

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**Objectives:**

1. Implement in-class case studies and in-class or on-line discussions which foster development of diagnostic reasoning skills, application of EBP guidelines to practice, and promote analysis and application of content to patient and practice specific topics.
2. Create examinations which evaluate competency and reflect best practice in test item design.



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**Presentation Outline:**

- **Part One:** Use of Case Studies – Dr. Waldrop
- **Part Two:** *Discussion Questions* to promote active learning and student engagement – Dr. Wink
- **Part Three:** *Testing* via examinations which evaluate achievement of course objectives and practice competencies - Dr. Blackwell
- **Part Four:** Skill practice



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## Using Cases to Teach Diagnostic Reasoning

Julee Waldrop, DNP, FNP, PNP, CNE  
*Associate Professor and Coordinator of Post MSN-DNP Program*  
College of Nursing  
University of Central Florida

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### New Skills for Nurse Practitioner Students

- Formulating an inquiry strategy includes
  - Thorough history (types of questions asked)
  - Thorough physical exam
  - Use of tests
- Differential Diagnosis (hypotheses)
- Diagnosis (best bet)
- Plan (evidence based)
- Evaluation (follow up)





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### Case Studies can help you do this

Options:

- Do as a whole class
- Divide into groups and come back to report out
- Do as a staged case online within discussion groups





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Case Example



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Case Example

- 16 year old female
- CC: "I have not yet had a period"
- HPI: Nothing pertinent\*
- PMH: Has "migraine" headaches about every other month. No surgeries, no hospitalizations.
- ROS: Pertinent positives – headaches as above. Admits to some vaginal discharge that does not have an odor.



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Case Example

- FmHx: Mom has migraine headaches. Mother started her period at age 15 and Sister at age 14. Father has HTN, high cholesterol and is obese.
- SHx: Denies smoking, using illicit drugs or ever having had sexual activity but does have a steady boyfriend. Lives at home with Mom and Dad and younger sister. Gets straight As in school. Participates on varsity track team. Reports good appetite.
- Allergies: NKDA
- Meds: Motrin prn



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Case Example

- PE: VS WNL
- Wt: 97 lbs; Ht: 61.5 inches; BMI: 18
- HEENT; Neck; Lungs; CV; Abdomen all WNL
- Tanner stage 4
- Skin: faint facial hair noted
- GU: normal external genitalia



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First Step:

Differential Diagnoses



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Next Steps:

- 2<sup>nd</sup> Step:
  - For each differential diagnosis
    - Identifying supporting and non-supporting data
    - Might need more history)
- 3<sup>rd</sup> Step:
  - Tests that will help rule in or out each diagnosis
    - Test results – your choice
- 4<sup>th</sup> Step: Final diagnosis
  - Based on your choice of results
- 5<sup>th</sup> Step: Plan –
  - Based on your diagnosis



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Guide table for working in class or online

Diff Dx	Supporting Data	Non-Supporting Data	More History?	Tests Labs	Results	Plan & F/U



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Resources

Banner, HS & Pickell,GC (1991). *Developing Clinical problem-solving Skills. A guide to more effective diagnosis and treatment.* W.W. Norton & Company, NY.

Bowen, J. L. (2006). Educational Strategies to Promote Diagnostic Reasoning. *NEJM*, 355, 2217-2225.



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Discussions to Promote Active Learning and Student Engagement

Diane M. Wink EdD, ARNP, FNP-BC, FAANP  
Professor and Hugh F. and Jeannette G. McKean  
Endowed Chair in Nursing  
Coordinator of Nurse Educator Program  
College of Nursing  
University of Central Florida

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### Why discuss?

- Discussion as a learning activity
  - Develop collaboration skills
  - Develop criticism skills
  - Develop ability to
    - Analyze data
    - Synthesize data
    - Propose change or intervention based on conclusions
  - Faculty identification of student learning needs
- Discussion as an evaluative activity
  - Demonstration of expected competency



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### Where to discuss?

- In class
- On the web



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### What to discuss?

- Issues
  - Policy
  - Ethical
  - Practice Management
- Personal Development
  - NP role development
  - Personal Goals
- Clinical case
  - Pathophysiology Based
  - Pharmacology Based
  - Clinical Decision Making Based



Graphic from <http://log.capital.org>



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- ### Using the web for discussion
- Clear instructions
    - Clear goals
    - How it will work
    - How to do it
    - When to do it
- UCF

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- ### Sample web case discussion
- Clear Goals:
1. Collaborate with peers to plan primary care for adults.
  2. Integrate knowledge about the care of adults with common primary care health problems.
  3. Design, implement and evaluate primary care for adults
  4. Access knowledge needed to provide evidence-based primary care
- UCF

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Sample web case discussion

How it will work

1. Each student will be assigned to a case study group set up by the course faculty.
2. Each group will discuss a series of cases
3. Group members will be sent case information 7-10 days before their case is to start
4. All group members should have their initial post ready to post by the day the case discussion is to begin.
5. All group members will participate in the discussion but only selected students will write a report on one assigned case.



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Sample web case discussion

How to do it

- Log on to discussion at least three times during the case week (see schedule for dates)
- Read, analyze, respond to specific content of the posts of group members, ask questions, critique ideas and statements, make recommendations, suggest use of EBP and other practice resources
- Active engaged discussion is expected
- Include citations to EBP and other publications used.
- A citation is NOT required for every post.



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Sample web case discussion

- When to do it
  - Have initial post ready to post on day discussion starts
  - If assigned to write a summary of the case, post by date on course schedule



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### Ask good questions

- Student selection of question from a list
  - Pro:
  - Con:
- Faculty assignment of question
  - Pro
  - Con
- Same question for all
  - Pro
  - Con



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### Rubrics

- Should evaluate student preparation, participation
- Should not demand perfect performance



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### Problem rubric: Example A

Objective/Criteria	Performance Indicators			
	Above expectation	Meet Expectations	Below Expectation	Missing or not done
Initial post reflects thoughtful analysis and exploration of assigned topic	(2 points)	(1.5 points)	(1 points)	(0 points)
Active engagement in discussion throughout discussion week	(1 points)	(0.5 points)	(0.25 points)	(0 points)
Thoughtful responses which expand discussion	(2 points)	(1.5 points)	(1 points)	(0 points)
Resources clear/ APA	(1 points)	(0.5 points)	(0.25 points)	(0 points)

out of 6



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**Problem rubric: Example B**

Module Discussion Score					
Criteria	Ratings				Pts
Initial post identifies correct differential, diagnostic testing, and needed treatment based on information provided	No errors in post 1.5 pts	Few errors in post 1.25 pts	Many errors in post 1 pts	Post Missing or late 0 pts	1.5 pts
Gold standard EBP guideline used as a reference	Used gold standard EBP guideline 1.5 pts	Used good guideline but not gold standard 1.25 pts	Used resources from inappropriate sources. 1 pts	No resources used 0 pts	1.5 pts
Total Points: 3					




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**Problem rubric: Example B**

Module Discussion Score					
Criteria	Ratings				Pts
Initial post identifies correct differential, diagnostic testing, and needed treatment based on information provided	No errors in post 1.5 pts	Few errors in post 1.25 pts	Many errors in post 1 pts	Post Missing or late 0 pts	1.5 pts
Gold standard EBP guideline used as a reference	Used gold standard EBP guideline 1.5 pts	Used good guideline but not gold standard 1.25 pts	Used resources from inappropriate sources. 1 pts	No resources used 0 pts	1.5 pts
Total Points: 3					

This rubric would be appropriate only if student would be expected to be able to do these items before engaging in the discussion.  
**EVALUATION!!**




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**Rubrics**

- May have a blend of preparation and perfect performance




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Problem rubric from Example A fixed

Objective/Criteria	Performance Indicators			
	At expectation	Meets some expectations	Below Expectation	Missing or not done
Initial post reflects thoughtful analysis and exploration of assigned topic	(2 points)	(1.5 points)	(1 points)	(0 points)
Active engagement in discussion throughout discussion week	(1 points)	(0.5 points)	(0.25 points)	(0 points)
Thoughtful responses which expand discussion	(2 points)	(1.5 points)	(1 points)	(0 points)
Resources clear/ APA citations accurate	(1 points)	(0.5 points)	(0.25 points)	(0 points)

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- Sample Discussions and Rubrics
- Professional Goals Discussion
  - Professional Issues Discussion
  - Case Discussion
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Professional Goals Discussion

Students assigned a topic to present:

- Introduce yourself to other's in the group.
- Let them know about your clinical background
- Tell others in your group about the type of site where you will be doing your clinical practice course.
- Discuss with group members how you will achieve three of your professional growth goals this semester. Base your goals on the 2012 statement of *Nurse Practitioner Core Competencies*  
<http://www.nonpf.com/displaycommon.cfm?an=1&subarticlenbr=14>




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### Rubric to evaluate professional goals discussion

Initial Discussion Post						
Criteria	Ratings					Pts
Initial post by stated date	Done 1 pts	Late but done 0.5 pts	Not done or over a week late 0 pts			1 / 1 pts
Included brief professional background and description of site	Excellent 4 pts	Very good 3 pts	Needs more detail 2 pts	Needs much more detail 1 pts	Not done or unacceptable 0 pts	4 / 4 pts
Discussed Professional growth goals based on competencies	Excellent 4 pts	Very good 3 pts	Needs more detail 2 pts	Needs much more detail 1 pts	Not done or unacceptable 0 pts	3 / 4 pts
Active participation in discussion	High level of ongoing discussion 3 pts	Good level of ongoing discussion 2 pts	Low level of ongoing discussion 1 pts	No engagement in discussion 0 pts		2 / 3 pts
Total Points: 10 out of 12						




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### Professional Issues Discussion Example A

Students assigned a question to post on the same general topic:

Access the web pages of the assigned professional organization. Summarize initiatives they have to support NP full scope of practice and how individual NPs can be involved.

- **Student A:** NOPNF
- **Student B:** AANP
- **Student C:** NAPNAP
- **Student D:** American Association of Nurse Anesthetists




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### Professional Issues Discussion Example B

Students assigned a question to answer on a variety of topics covered in the module:

- **Student E:** Identify a public policy that has a positive impact on the general health of the populace which is not described in the course text. What are the societal and political forces that brought this about?
- **Student F:** Identify currently proposed legislative bill being considered in the state legislature which is of significant consequence to advanced practice nurses, nursing practice or health care in general. Describe the legislation and its expected impact. Take a stand for or against the proposed legislation and why you have chosen that position. Include the number of the bill in our post.




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**Rubric to evaluate learning and competencies in issue discussion**

Objective/Criteria	Performance Indicators			
	Meets Expectations	Meet Most Expectations	Meets Few Expectations	Not done
<b>Initial Post reflects thoughtful analysis and exploration of assigned topic</b>	(2 points)	(1.5 points)	(1 points)	(0 points)
<b>Active Engagement in discussion throughout discussion week</b>	(1 points)	(0.5 points)	(0.25 points)	(0 points)
<b>Thoughtful responses which expand discussion</b>	(2 points)	(1.5 points)	(1 points)	(0 points)
<b>Resources clear/ APA</b>	(1 points)	(0.5 points)	(0.25 points)	(0 points)

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**Case Discussion Example**

Example:

- Students are sent a case study before the discussion starts. This includes the patient assessment and basic background information about the patient.
- Differential may be provided or could be relatively clear from this information and verified by faculty as the case evolves.




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**Case Discussion Topics Example**

Students assigned a topic to address:

- Topic 1: Specific diagnostic tests, meds, teaching needed
- Topic 2: Collaborative needed with other health care providers
- Topic 3: Collaborative actions with community resources, family members / friends.
- Topic 4: Discussion of items related to client's race or culture, family status, work or other social items
- Topic 5: Health Promotion needs of the client/ family
- Topic 6: Summary of usual charges for the visit, labs, dx tests
- Topic 7: Up to five differential diagnoses
- Topic 8: Set of not more than 20 questions r/t the case




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### Case Discussion Example

UCF College of Nursing  
Case Study Sign up NGR 6201 Spring 2013  
Group Three: Focus of initial post

Student Name	Case One	Case Two	Case Three	Case Four
Student A Case One Report	Address Topic 7	Address Question 5	Address Question 3	Address Question 1
Student B Case One Report	Address Topic 8	Address Question 6	Address Question 4	Address Question 2
Student C Case Two Report	Address Question 1	Address Topic 7	Address Question 5	Address Question 3
Student D Case Two Report	Address Question 2	Address Topic 8	Address Question 6	Address Question 4
Student E Case Three Report	Address Question 3	Address Question 1	Address Topic 7	Address Question 5
Student F Case Three Report	Address Question 4	Address Question 2	Address Topic 8	Address Question 6
Student G Case Four Report	Address Question 5	Address Question 3	Address Question 1	Address Topic 7
Student H Case Four Report	Address Question 6	Address Question 4	Address Question 2	Address Topic 8

See courses schedule for date when each case starts and when final reports are due

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### Rubric to evaluate case discussion

Criteria	Ratings						Pts	
Initial post on first day	Done 2 pts	Day late 1 pts	Over one day late 0 pts			Not Done 0 pts	2 / 2 pts	
Initial post on assigned topic, Ongoing discussion	Outstanding 7 pts	Very well done 6 pts	Very Good but off topic 5 pts	Good 3 pts	Good but off topic 2 pts	Needs great improvement 1 pts	Not done 0 pts	6 / 7 pts
Active engaged discussion with substantive contributions view longer description	Outstanding 7 pts	Very well done 6 pts	Very good but needed more depth or scope 5 pts	Good but minimal engagement 4 pts	Minimal contributions in depth and scope 3 pts	Very low level participation/ contribution 2 pts	Not Done 0 pts	5 / 7 pts
Reflected review of relevant high quality resources view longer description	Outstanding use of resources 4 pts	Very good use of resources 3 pts	Good use of resources 2 pts	Course texts only 1 pts	None 0 pts		2 / 4 pts	
Citations in APA format	Minimal APA errors 2 pts	Multiple APA errors 1 pts	APA not reflected in citation 0 pts			2 / 2 pts		

Total Points: 17 out of 22

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### Using the web for discussion

- Clear instructions
- Ask discussion questions to promote engaged discussion
- Allow time to prepare, post, engage and respond
- Require engaged discussion
- Provide feedback along the way
- Rubric reflective of discussion type

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References

- Hsu, L., & Hsieh, S. (2006). An exploration of scenario discussion in a web-based nursing course. *Journal Of Nursing Research, 14*(2), 155-165
- Pinch, W., & Graves, J. (2000). Using web-based discussion as a teaching strategy: bioethics as an exemplar. *Journal Of Advanced Nursing, 32*(3), 704-712. doi:<http://dx.doi.org/10.1046/j.1365-2648.2000.01531.x>



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## Testing As an Evaluative Method

Christopher W. Blackwell, Ph.D., ARNP, ANP-BC, CNE  
*Associate Professor and Coordinator of Nurse Practitioner Programs*  
College of Nursing  
University of Central Florida

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Purposes of Evaluation

- Identification of learning
  - Allows students to demonstrate mastery of essential themes, content, and objectives
- Determination of grades
- Diagnosis of problems:
  - Learning Needs
  - Learning Deficits
- Prepares for Cert Exam



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### Achievement Tests and Assessments

- Test questions should measure learning outcomes and students' learning characteristics
- Results should be valid and reliable
  - Tests what it's meant to test and with results that are statistically reproducible
- Provides input for faculty about where content emphasis is needed or where misinterpretations possibly occurred



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### Planning the Test

- Step One: Determine the best type of exam to administer for given objective
- Step Two: Define intended learning outcomes (can use Bloom's Taxonomy)
- Step Three: Decide the types of test questions to use
  - Multiple Choice
  - True/False
  - Matching
  - Fill in the Blank
  - Essay
- ANCC Examinations are all primarily multiple choice



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### Planning the Test

- Step Four: Develop the Test Blueprint:
  - Match the blueprint with the purpose of the test
  - Relate learning outcomes to content
- Indicate the weight needed for each item:
  - How much time was spend on each area for instruction?
  - Which outcomes are most essential for retention and transfer?



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### Planning the Test

- Testing Blueprint Example  
(Cardiovascular 50 Question Exam):

Content Area	Assessment	Diagnosis	Management	Outcome Evaluation
HTN	5	1	5	1
Dysrhythmias	2	2	2	1
Ischemic Dx	3	3	6	2
HF	5	5	1	1
Hyperlipidemia	0	0	2	1
Coagulation Dx	1	1	1	0



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### The Anatomy of a Question

- Multiple-choice questions typically have 3 parts: a stem, the correct answer – called the key, and several wrong answers, called distractors:
- Stem:
  - A 45 year-old female patient complains of shortness of breath. Which item in the patient’s history would indicate a risk for chronic obstructive pulmonary disease (COPD)?
- Distractors/Key:
  - a. mother with COPD
  - b. 25-year pack history (KEY)**
  - c. exercise-induced asthmatic episodes
  - d. fever and productive cough for one week



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### Procedural Rules: Stem Writing

- Use either the best answer or the correct answer format
- Best answer format refers to a list of options that can all be correct
  - Each has an advantage, but one of them is the *best*
- Correct answer format refers to one and only one right answer
- Use the active voice
- Have your questions peer-reviewed
- Avoid giving unintended cues such as making the correct answer longer in length than the distractors.



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**Procedural Rules: Stem Writing**

- Ensure that the directions in the stem are clear, and that wording lets the examinee know exactly what is being asked
- Avoid window dressing (excessive verbiage) in the stem
- Word the stem positively; avoid negative phrasing such as “not” or “except”
- Include the central idea and most of the phrasing in the stem
- Avoid giving clues such as linking the stem to the answer



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**Writing a Good Stem**

- BAD stem:  
Which drug would be best for pneumonia?
- WHY is this a bad stem?
  - Could reflect direct recall rather than critical thinking
  - There are multiple types of pneumonias with various evidence-based treatment approaches
  - There are no data in the question to assist the student in drawing any clinical correlations



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**Writing a Good Stem**

- Let's fix it!

A 79 year-old female presents to the emergency department from a skilled nursing facility with fever of 102°F and shortness of breath for 36 hours. Her SPO<sub>2</sub> is 86%, and the patient's chest x-ray reveals diffuse bilateral infiltrates. Which action would be best?



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**Procedural Rules: Options and Distractors**

- Place options in logical or numerical order
- Use letters in front of options rather than numbers
- Keep options independent; don't overlap options
- Keep the length of options fairly consistent.
- Avoid, or use sparingly, the phrase all of the above
  - NOT used on ANCC exams
- Avoid, or use sparingly, the phrase none of the above
  - NOT used on ANCC exams
- Avoid distractors that can clue test-wise examinees:
  - Absurd options, formal prompts, or semantic (overly specific or overly general) clues



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**Procedural Rules: Options and Distractors**

- Position the correct option so it appears about the same number of times in each possible position
- Make sure that there is one and only one correct option
- Use plausible distractors.
- Incorporate common errors of students in distractors
- Use familiar yet incorrect phrases as distractors
- Use true statements that do not correctly answer item
- Distractors that are not chosen by any examinees should be replaced; statistical analysis can show this



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**GOOD Question**

A 79 year-old female presents to the emergency department from a skilled nursing facility with fever of 102°F and shortness of breath for 36 hours. Her SPO<sub>2</sub> is 86%; and the patient's chest x-ray reveals diffuse bilateral infiltrates. Which action would be best?

- admit the patient to a medical/surgical unit and begin levofloxacin (Levaquin®)
- repeat the chest x-ray in the emergency department to confirm the suspected diagnosis
- discharge the patient and prescribe azithromycin (Zithromax®) 250 mg per day for 10 days
- obtain sputum gram stain and culture and sensitivity and begin antibiotic therapy when the results are obtained



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**BAD Question**

A 5 year-old patient presents with otitis media. Which action is best?

- a. prescribe amoxicillin (Trimox®)
- b. educate parents about the use of acetaminophen (Tylenol®) for fever
- c. educate parents about the use of aspirin (Bayer®) for fever
- d. educate the parents about the importance of adequate hydration



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**Validity and Reliability of Tests**

- Validity:
  - Does exam measure what it is intended to measure?
  - Was the test properly constructed, administered, and scored?
- What was the correlation coefficient ( $r$ )?
  - Positive Relationship: High or low scores on one measure are accompanied by high or low scores on another
  - Negative Relationship: High scores on one measure are accompanied by low scores on another measure



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**Validity and Reliability of Tests**

- Reliability:
  - Degree of consistency of test scores
- Measured by Kuder-Richardson Formulas (KR-21)
  - KR-21 should be between .5 and .8



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### Validity and Reliability of Tests

- Factors That Lower Reliability of Test Scores:
  - Too few items
  - Too many too hard or too easy items
  - Inadequate test conditions
  - Poorly written items without discrimination
  - Scoring is subjective



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### Item Analysis

- Item Difficulty (*P* Value):
  - Percentage of group who answered item correctly
  - $P = .05$  (50%) = Good Discrimination Index
  - Upper limit = 1 (100% answered correctly)
  - Lower limits depends on # of possible responses and probability of guessing correctly
  - If 4 options (A, B, C, D) then  $P = .25$  (possibility of guessing right answer)



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### Item Analysis

- Item Discrimination: Who Knew it and Who Didn't!
  - Measured through point biserial correlation
  - Good discrimination item = Point biserial are highly positive for correct answer and negative for distractors
  - Indices  $> .3$  are good;  $> .4$  = VERY good



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### Item Analysis

- Distractor Evaluation:
  - Evaluate each individually
  - Should appeal to the non-learner
  - Point biserial = 0 = Students didn't select; needs revision/replacement
  - Negative discriminating power occurs when more students in lower group than upper group choose correct answer: Needs revision/replacement!



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### Item Analysis

- Compute Item Analysis:
  - Mean Score: Average score of test-takers
  - Median: The point at which 50% are higher and 50% are lower
  - Standard Deviation: Measures variability of test scores around the mean
  - Ideal = Item answered correctly by 1/3; answered incorrectly by lower 1/3



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### Item Revision

- P values are too high or too low
- Correct answers have low positive or negative point biserials
- Distractors have highly positive point biserials
- Items that correlate  $< .15$  with total test scores should be restructured; probably confusing or nonsensical to test takers



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**Examples**

1. Which of the following would be suggestive of heart failure?

- S3 and S4 audible at apex
- S2 sound louder at base
- S1 sound louder at apex
- S1 and S2 equal at Erb's point

Point-Biserial = -.27    Correct Answer = A    Total Group = 88.24%

Distractor Analysis:	A	B	C	D
Point-Biserial:	-.27	.27	0.00	0.00
Frequency:	88%	12%	0%	0%




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**Examples**

2. A patient presents to the primary care clinic with a new onset of cough? Which newly prescribed medication might be responsible for this new symptom?

- acetaminophen (Tylenol®)
- acarbose (Precose®)
- lisinopril (Zestril®)
- atorvastatin (Lipitor®)

Point-Biserial = -.61    Correct Answer = C    Total Group = 76.47%

Distractor Analysis:	A	B	C	D
Point-Biserial:	-.59	0.00	0.61	-.24
Frequency:	6%	0%	88%	6%




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**References**

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