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# **Teaching an Evidence-Based Problem-Oriented Physical Examination:**

**Integrating the Cornerstone of Clinical  
Medicine with the Power of Evidence**

# Physical Diagnosis – Strategies for Teaching and Learning

- Physician assistant educational programs universally provide skills in the art and science of the physical examination during the didactic phase of PA education
- Mastery of these skills is central to the development of competencies necessary for the safe and effective care of patients, and remains an integral component of the patient-provider relationship

# Physical Diagnosis – Strategies for Teaching and Learning

- Early skill development in physical diagnosis typically centers on the rote memorization and execution of techniques prior to the development of a foundation in clinical thinking
- This decontextualized approach results in data-gathering without appreciation for how a targeted application of exam techniques can identify findings relevant to a differential diagnosis

# Physical Diagnosis – Strategies for Teaching and Learning

- This PE immersion approach to physical diagnosis may enhance student recognition of “normal” leading to an improved ability to identify “not normal” - a beginning step in assessment
- But, it can also lead to frustration by students who want to understand the “whys” of clinical application prior to readiness and who are unable to understand the implications of their findings

# Physical Diagnosis – Strategies for Teaching and Learning

- An alternative approach is to utilize a decentralized sequence where the exam is taught piece-meal in conjunction with organ system curricula
- May result in a disjointed collection of component skills that do not cross organ system boundaries
  - OHSU SOM PE skills taught over a two year period of time

# Physical Diagnosis – Strategies for Teaching and Learning

- The memorization of a ‘Head-to-Toe’ screening physical examination secures the student’s ability to perform general data collection in clinical settings, but if PE techniques are not associated with a patient complaint, students do not easily develop an appreciation of the relationships between clinical signs and symptoms.
- Hence the difficulty in choosing relevant PE maneuvers

# Hypothesis-Driven vs. Non Hypothesis-Driven Physical Examination

- Anecdotally we know that learning in the clinical environment is cemented when associated with a patient, yet we do not have the luxury of access to multiple patients during the didactic phase
- Can clinical cases serve as proxy for the actual patient?
- Can those clinical cases help students choose appropriate exam techniques?

# Hypothesis-Driven vs. Non Hypothesis-Driven Physical Examination

- Diagnostic reasoning is enhanced when constituent skills include a focused history taking followed by the development of an initial D/Dx, which then results in anticipation of physical examination maneuvers likely to confirm or refute the working differential
- Early efforts by students often fail to link the PE to specific differentials

# Hypothesis-Driven vs. Non Hypothesis-Driven Physical Examination

- “PE signs more readily identified when the doctor has the correct differential diagnosis in mind – ‘co-selection’”

Norman et al.

- Assisting students in learning a step-wise process linking the differential to the PE may help focus the PE to “relevant” exams resulting in a hypothesis-driven examination

# Hypothesis-Driven vs. Non Hypothesis-Driven Physical Examination

- A hypothesis-driven exam reduces the possibility that students will perform unfocused examinations that miss critical areas of investigation and fail to identify key findings
- Once a differential is developed, students must then choose appropriate techniques directed at the differential, avoiding exams just because they are “in the neighborhood”

# Evidence-Based Physical Examination

- We've taught our students all of the techniques, but what is the diagnostic accuracy of the physical signs? Should they even do some of these techniques? Does anyone percuss the heart border anymore?
- We know that once students begin clinical training, their PE skills dwindle as they see shortcuts and omissions (some good, some not!)
- Can we bridge the divide between academic and clinical realities?

# Evidence-Based Physical Examination

- How do we reconcile “traditional physical diagnosis with contemporary diagnostic standards”? – McGee
- Extreme positions range from:
  - all traditional skills are relevant and should be taught TO
  - modern medicine has little to gain from traditional signs elicited during a physical examination; diagnostic data has replaced physical diagnosis in importance

# Evidence-Based Physical Examination – What We Do

- We attempt to enhance skills beyond rote performance of the physical examination by incorporating a longitudinal evidence-based problem-oriented physical examination series in conjunction with clinical medicine topics.
- Students work through more than sixty problem-oriented exams during the academic year – each of which includes the development of a differential diagnosis, identification of an appropriate problem-oriented exam and an exploration of the evidence (or lack thereof) behind the techniques they wish to incorporate.

# Problem Oriented Physical Examinations (POPEs)

- This instructional framework provides guided practice in diagnostic reasoning skills and assists students as they transition from rote performers to more sophisticated users of a menu of examination techniques.

# Problem Oriented Physical Examinations (POPEs)

- Students sign up for unidentified cases in blocks of medicine
- Faculty email the chief complaint, HPI and vital signs
- Students generate a differential and proposed physical examination
- They meet with faculty to review their diagnostic reasoning and decision making regarding physical diagnosis

# Problem Oriented Physical Examinations (POPEs)

- Student and faculty member come to consensus and student chooses a relevant physical examination component to research and demonstrate in class
- They must find evidence of the technique's effectiveness and write a brief paper summarizing the evidence (or lack thereof)
  - “evidence-based physical diagnosis simply summarizes the best evidence available whether a physical sign is accurate or not”
    - McGee

# Problem Oriented Physical Examinations (POPEs)

- Resources for students
  - Clinical Medicine textbooks
  - Clinical resources such as Up To Date
  - Evidence-Based resources through PubMed including JAMAevidence
  - Our support librarians

# PROBLEM ORIENTED PHYSICAL EXAMINATIONS

## HEMATOLOGY / ONCOLOGY

- **CC:** “My legs hurt, my gums are bleeding and I keep getting nosebleeds” x several days.
- **HPI:** Jenny Busby is a 17-year-old girl who has been having leg pains for the past week. She states the pain is achy and concentrated in her thighs and knees. In addition, she has noted that her toothbrush has been bloody after brushing her teeth for the past 5 days, and she has developed several bruises. In addition, she has had two bloody noses recently. She has not previously been prone to bleeding or bruising. She denies any history of trauma, and has not begun any new physical activities. She has been feeling tired and run down, and has stayed home from high school this week, and feels too ill to go out with her friends. She denies fever, weight loss, nausea, vomiting or diarrhea, but has had a diminished appetite. Her past medical history is negative for recent illnesses, chronic illnesses, hospitalizations or surgeries.
- **Vital Signs:** Temp 99.8 F, Pulse 98 bpm, Resp 20/minute, BP 112/76 mmHg RA sitting

# Differential Diagnosis

**Identify the top 5 items on your differential diagnosis for this complaint:**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

# PE Based on the Differential Diagnosis

- Based on this list, indicate the most appropriate physical examination procedures to perform on this patient in order to rule in/out items from the differential diagnosis list:

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# Faculty Guide to the Differential

- **Identify the top 5 items on your differential diagnosis for this complaint:**
  1. Acute leukemia
  2. Thrombocytopenia
  3. Other platelet disorders (aplastic anemia /myelodysplasia)
  4. Chronic liver disease / Vitamin K deficiency
  5. Von Willebrand – innate or acquired (change in platelet adhesion)
  6. Meds – ASA / NSAIDS
  7. Pregnancy

# Problem Oriented Physical Examination

## COMMUNICATION

- Greet patient
- Introduce yourself
- Wash hands

## PHYSICAL EXAMINATION

### General Appearance

- Assess for acute or chronic illness, toxicity

### Skin

- Inspect skin for purpura / petechiae

### HEENT

- Inspect conjunctiva for pallor
- Inspect nares for bleeding / lesions
- Inspect oral cavity including gingival surfaces

### Lymph

- Palpate cervical nodes
- Palpate supra/infraclavicular nodes
- Palpate axillary nodes
- Palpate inguinal/femoral nodes

### Abdominal

- Palpate spleen
- Palpate liver

### Musculoskeletal

- Inspect legs and knees
- Palpate legs and knees for tenderness

### Unnecessary Exam components:

# Scoring the Student Presentation

## Overall preparation: \_\_\_/10

- Was the student well-prepared to give support for or against items on the differential list?
- Did the student present material in a confident and organized manner?

## Quality of d/dx list: \_\_\_/5

- Was the d/dx list comprehensive and appropriate without being unfocused?
- Were they able to prioritize the most likely diagnoses?

## Leadership skills: \_\_\_/5

- Did the student execute crowd control appropriately?
- Did they encourage questions and ask fellow students to explain their reasoning?
- Was the time limit adhered to?

## Problem oriented exam: \_\_\_/5

- Did the student offer support for the exam components listed on the white board?
- Was it an appropriate problem-oriented exam, including all pertinent components?

# Scoring the Student Presentation / Investigation

## Exam component demonstration: \_\_\_/5

- Was it supported by evidence?
- How much effort was made?
- Was it competently demonstrated?

## Exam component write up: \_\_\_\_/5

- Was it supported by evidence?
- Did it provide a reasonable justification for inclusion in the problem oriented exam?
- Was it clearly written in 2 pages or less utilizing at least 2 appropriate citations according to directions?

## Follow through with Faculty

Yes \_\_\_\_\_

No \_\_\_\_\_

- Did the student meet with faculty at the appropriate time having prepared in advance?

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