

# Enhancing Orthopedic Diagnostic Skills for Primary Care NP Students with an Interdisciplinary Cadaver Lab Experience

Andrea Wolf, DNP, CRNP  
Associate Professor and NP Program Director  
York College of Pennsylvania



# Objectives

- Present a strategy for using a cadaver to teach orthopedic skills to NP students
- Provide student perspective for improvement
- Provide lessons learned!



# HRSA Grant

This learning activity was made possible through an Advanced Education Nursing grant received from the Health Services and Resource Administration.

Grant #D09HP22595



# Anatomy Course

- Offered to undergrad pre-med students
- 3 credit undergrad course- anatomy lectures and cadaver labs presented by surgical residents
- Our CRNA students were attending a portion of the course
- How could NP students benefit from this opportunity?



# Objectives of Learning Activity

- Provide a unique learning opportunity often not available to NP students that enhances orthopedic diagnostic skills.
- Improve students' confidence in their orthopedic diagnostic skills.
- Make learning anatomy more relevant to clinical practice.



# Orthopedic Focus

- Lower Limb
- Upper Limb
- Back
- Neck

# Primary Care-related Orthopedic Conditions: Upper Limb

- ***Shoulder***: bursitis, adhesive capsulitis, rotator cuff tendonitis/impingement syndrome, dislocation/subluxation, AC joint separation, fractures
- ***Elbow***: Cubital Tunnel Syndrome, epicondylitis, olecranon bursitis
- ***Hand/Wrist***: CTS, DeQuervain's tendonitis, Trigger finger, ganglion, Duputryen's contracture, navicular and other fractures

# Primary Care-related Orthopedic Conditions: Lower Limb

- **Hip:** osteoarthritis, trochanteric bursitis, fractures, piriformis syndrome
- **Knee:** ligament injuries, meniscal injuries, IT band syndrome, patellofemoral syndrome, bursitis, synovitis, fractures, Baker's cyst
- **Ankle:** sprains, Achilles tendonitis, bursitis
- **Foot:** plantar fasciitis, tarsal tunnel syndrome, Morton's neuroma, tendonopathies, stress fractures





## Primary Care-related Orthopedic Conditions: Back and Neck

- **Back:** muscle strain, degenerative disease (facet syndrome, disc disease), disc herniation, radiculopathy, spinal stenosis
- **Neck:** cervical strain, Degenerative disease, radiculopathy, non-ortho (vessels- carotid disease, thyroid)



# Format

- Enhancement for the first diagnosis and management course
- Anatomy lecture and lab time not included in course credits
- Surgical residents for anatomy lectures
- Ortho residents for cadaver labs
- Lecture and lab sessions scheduled on different evenings



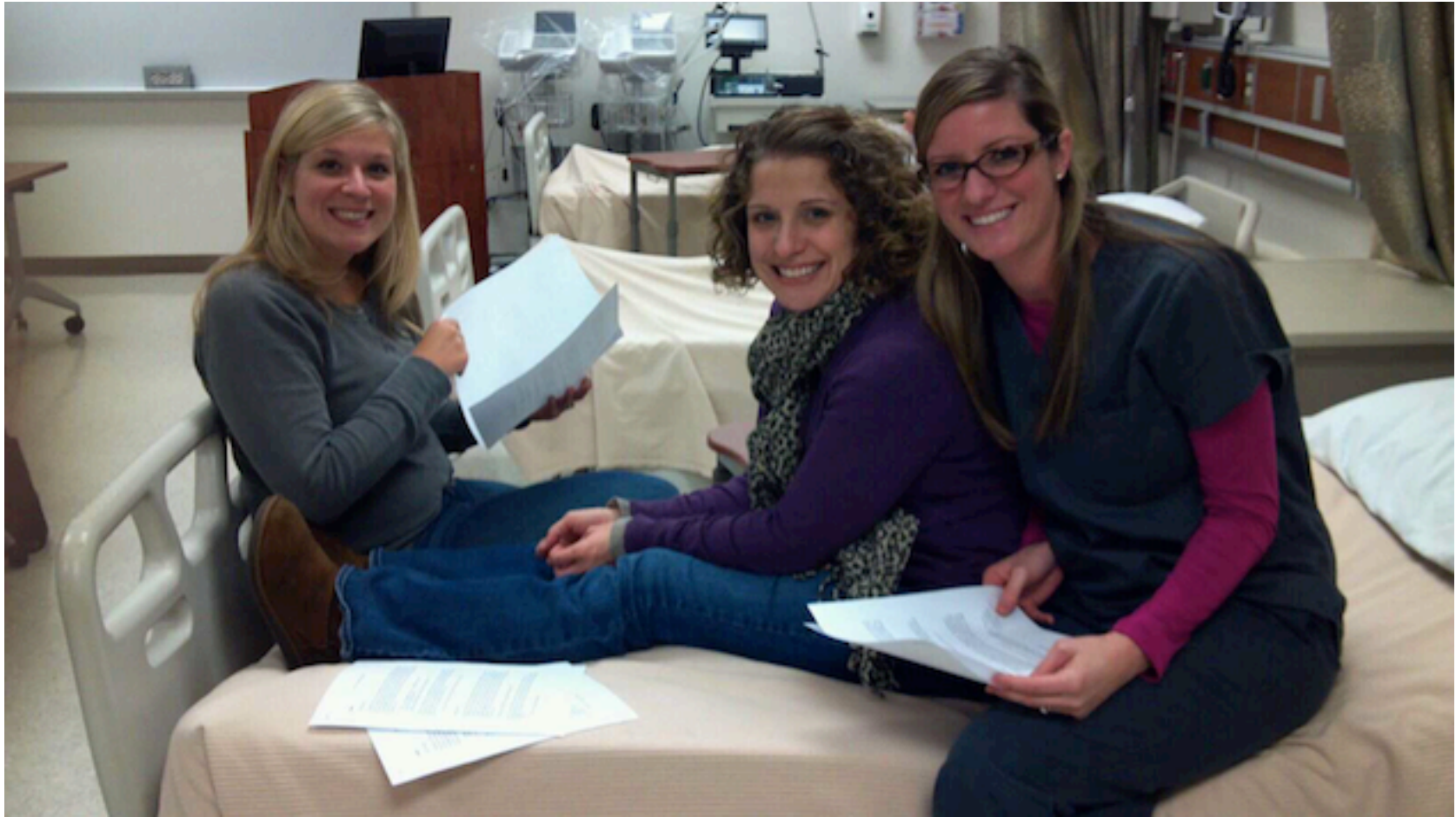




# Format

- Texts not required but encouraged
- No formal grade; pre and post written exam plus practical exam
- Coordinated with class lectures and lab practice of exam techniques using case studies
- 14 students















# Evaluation

- Pre-cadaver lab survey of students
- Pre-experience anatomy quiz
- Post-experience anatomy quiz
- Lab practical graded by resident
- Post-cadaver lab survey to provide feedback from students

# Pre-cadaver Lab Experience

- *Do you have previous experience with a cadaver?*
  - Yes-36%; No- 64%
- *Do you have previous exposure with a dead body?*
  - Yes- 86%; No-14%
- *I believe that my current knowledge of M-S anatomy is adequate for assessment and diagnosis of orthopedic conditions*
  - Disagree- 57%; Strongly Disagree- 21%

# Pre-cadaver Lab Experience

- *I am expecting the cadaver lab experiences to be relevant to my current and future practice*
  - Strongly agree- 36%; Agree- 50%; neither agree nor disagree- 14%
- *I am expecting the cadaver lab to be a very stressful experience*
  - Strongly agree- 7%; Agree- 29%; Neither- 21%; Disagree- 43%

# Pre-cadaver Lab Experience

*Note any concerns you have prior to experience*

- “I fear the experience is going to be aimed at pre-med students.”
- “I fear I do not remember enough human anatomy to do well in cadaver lab.”
- “I am hoping I can handle the odor.”
- Concerned about time commitment
- “What is expected of me?”
- Number of students in the lab at one time
- Lab practical

# Pre-cadaver Lab experience

*Please indicate any suggestions you have prior to beginning the experience*

- Hoping the anatomy will be relevant to diagnosis
- “Want to know... exactly what we will be doing and how we will be doing it... definitely not prepared for the first experience.”
- “Fewer sessions, longer in length.”
- “Teach relevant things (for) primary care.”

# Pre-Cadaver Lab Experience

*Please discuss any barriers to learning you expect to have that are influenced by previous experiences either in your personal or professional life*

- Most could think of none
- “I have never seen the inside of a dead body before. I think the curiosity of figuring out the muscles, etc. will override the thought of what we are actually looking at and working with.”
- The amount of time this experience will take – needing to leave clinical early to get there, travel time, busy schedules, etc
- “Odors are a problem for me.”

# Post-cadaver Lab Feedback

- *I feel the cadaver lab experience contributed to my ability to assess and diagnose orthopedic conditions in a way that class lectures, journal articles, and lab practice could not*
  - Strongly agree- 28%; Agree 36%; Neither- 36%
- *I found that attending anatomy lectures prior to lab were helpful in getting more out of the lab experience*
  - Strongly agree- 7%; Agree-28%; Neither- 21%; strongly disagree- 7%

# Post-cadaver Lab Feedback

- *I found the entire experience (lecture and lab) to be relevant to current and future practice*
  - Strongly agree- 21%; Agree- 43%; Neither- 29%; Disagree- 7%
- *The experience has contributed to my overall confidence in diagnosing orthopedic conditions*
  - Strongly agree- 21%; Agree- 21%; Neither- 29%; Disagree- 29%



# Post-cadaver Lab Feedback

- *Overall, this experience is worth the time invested*
  - Strongly agree- 21%; Agree- 29%; Neither- 36%; Disagree- 14%
- *I recommend this experience for future NP classes*
  - Yes- 71%; No- 29%

# Post- cadaver Lab Experience

*Please explain what would make this a more meaningful experience for other students*

- “It would be better placed with health assessment or pathophysiology classes because it is a lot of extra time for an already busy semester.”
- “We did very little with cadaver ourselves...just stood and watched. Lectures were over my head...”
- Better preparation for assignment, (e.g.) lab practical final
- “Students need to be more aware of the time commitment ahead of time”.
- “More focus on appropriate testing and exam and less on anatomy and surgical implications.”

# Post-cadaver Lab Feedback

## Additional comments

- Lectures not helpful at all
- Lab very good
- “Overwhelmed with details and can’t recall much of anything.”
- “Should be in all NP programs... grateful for the experience and it did enhance my learning.”
- Should be more hands-on lab
- “Excellent class and enjoyed every minute of it!”
- “Receiving no credit for this time very discouraging...lack of impact on grades... created negative attitudes”
- Unfortunately, most of my classmates felt like guinea pigs, though I thoroughly enjoyed it...wonderful look at structure form and function”



# My Perspective

- Lectures too detailed, overwhelming, need more emphasis on ortho conditions
- Too many students in lab at same time
- Condition of cadaver poor but not critical
- Surgical residents lacked primary care perspective
- Ortho residents critical to the success of experience
- Schedule was counter-productive
- Too fragmented



# Future Plans

- Design course to better suit our needs
- Eliminate lectures; provide students with anatomy modules to complete at home
- Substitute time spent in lectures with ortho resident-led demo and practice of exam techniques immediately following lab
- Include simulated injection techniques in practice sessions
- Schedule 2 groups for lab
- Consider offering prior to start of semester

