Designing Gross Anatomy Education for Athletic Training Students: Planning for a Continuum of Care

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Athletic Training: Overview

• Athletic training is recognized by the American Medical Association as a health care profession.

• Nationally certified and state credentialed health care professionals who collaborate with physicians to optimize activity and participation of patients and clients.
What are Athletic Trainers and What do They do?

Athletic training encompasses the prevention, diagnosis and intervention of emergency, acute and chronic medical conditions involving impairment, functional limitations and disabilities.
Scope of Athletic Training Practice

1. Injury/Illness Prevention and Wellness Protection
2. Clinical Evaluation & Diagnosis
3. Immediate & Emergency Care
4. Treatment, Rehabilitation, Reconditioning
5. Organizational and Professional Health & Well-being
Where can You Find Athletic Trainers?

- High schools & colleges/universities
- Professional sports teams
- Performing arts
- Hospitals and physician offices
- Rehabilitation clinics
- Industry
- Recreation settings
Common Foundation of Allied Health Profession Education

• All require anatomy
• All require other basic science coursework
• All have applied science/clinical courses
• All must apply basic science to clinical work with patients/clients
Current State of Anatomy Education in Athletic Training

- Must have anatomy coursework in curriculum

- Like some other allied health programs, some AT programs satisfy this requirement with one or two semesters of Anatomy & Physiology (A&P)
Current State of Anatomy Education in Athletic Training

- Most, though, use a devoted gross anatomy class but these are diverse
  - Applied Anatomy & Kinesiology
  - Applied Clinical Anatomy
  - Applied Anatomy
  - Clinical Human Anatomy
  - Gross Anatomy
  - Functional Anatomy
How is Anatomy Education Handled in Athletic Training Programs?

• Anatomy labs with cadaveric materials are rare at UG level

• Most AT programs that have cadaveric materials offer them by way of prosections
How is Anatomy Education Handled in Athletic Training Programs?

- Duquesne University is one of the very few programs to use full cadaveric dissection in AT anatomy education
Designing a Gross Anatomy Course for Undergraduates who are Athletic Training Students

Bearing in mind:

• Due to logistical constraints, allied health anatomy courses typically include students from >1 program

• Academic level of enrolled students may vary
  • Some at undergraduate level, while others at graduate level
  • Concerns: maturity, life experiences, and level of learning
Learning Styles of Students Dictate Teaching Methods

- Most undergraduate students demonstrate two learning stages:

<table>
<thead>
<tr>
<th>Concrete Operational Stage</th>
<th>Formal Operational Stage</th>
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<td>Logical manipulation of symbols related to concrete objects in same manner learned.</td>
<td>Ability to think abstractly, use deductive reasoning, critical thinking, and integrate information.</td>
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Learning Styles of Students Dictate Teaching Methods

- Most undergraduate students demonstrate two learning stages:

**Concrete Operational Stage**
- MEMORIZERS!

**Formal Operational Stage**
- THINKERS!
Learning Styles of Students Dictate Teaching Methods

Because they are mainly undergraduates, AT students, when compared to graduate students enrolled in gross anatomy, may not have developed skills to work independently or seek out answers to questions themselves.

Many of these students are stuck in the concrete learning stage.
Readiness for Learning

Classroom Learning
- Skills needed to succeed similar to past learning with this caveat: integrating information.

Laboratory Learning
- Self-directed cadaver work often difficult.
- Collaborative efforts required to accomplish work AND to learn.
- Difficulty with integration lessens comfort with new situations or cadavers.
Case Study in Designing an Effective Anatomy Course for AT Students: Duquesne University
Athletic Training at Duquesne University

- Entry-level Bachelor of Science – 3rd year students

- Human Anatomy taught by basic science faculty, not clinical faculty
  - Communication with AT faculty improves teaching of concrete and operational learning scenarios

- 5-credit, one-semester course
  - 5 ½ hours lecture, 4 hours cadaver lab

- Taken with masters level Occupational Therapy students in their 3rd year
- In accordance with AT scope of practice, course concentrates primarily on the limbs and spine but also includes overview of body cavities and neck

- HOWEVER, the scope of OT practice must also be considered in designing this anatomy course
  - The advantage is that it broadens learning for both groups!!!
Anatomy for Athletic Training
Students at Duquesne University

Concrete learners require:
- Heavy reliance on lots of visual aids during lecture, including YouTube videos!
- Weekly quizzes to force students to keep up
Anatomy for Athletic Training
Students at Duquesne University

- Transitioning students from concrete to formal operational learning:
  - Encourage students to design their own flashcards, tables & flowcharts rather than purchase them.
Anatomy for Athletic Training
Students at Duquesne University

- Transitioning students from concrete to formal operational learning:
  - Feed forward and feed backward the information
  - Interspersing clinical scenarios through lecture
  - Case studies region by region
Anatomy Laboratory Education at Duquesne

- Cadaveric dissection lab essential to learning!

- Groups of 6-8 students per cadaver

- Follow dissection guide on same cadaver for semester, BUT examinations require testing and knowledge of all cadavers in lab (eliminates concrete-only learning)
Anatomy Laboratory Education at Duquesne

- Alumni and graduating student feedback report that this is the setting where most of their learning occurs and is most valuable to them.

- This is the setting where they integrate didactic and practical information (formal operational thinkers).
Athletic Training Gross Anatomy at Duquesne University

- Students who are active learners in BOTH classroom and laboratory perform better in Anatomy AND in future clinical courses.

- Anatomy challenges them to become more advanced in their learning and clinical abilities than those who do not take Anatomy.
"Deniers" who avoid active learning and review opportunities both in lab and in the classroom struggle in the course and are reluctant to seek help.
Athletic Training Gross Anatomy at Duquesne University

Instructor dealing with “deniers”: Early intervention essential for success in the course (and program), work with department to develop strategies to promote learning and active participation.
Anatomy Education for Athletic Training Students at Duquesne University -- Challenges

- Lack of time management and/or organizational skills
  - Students in this course doing clinical rotations at the same time, which often interferes with study time.
  - Developing study strategies and conceptual frameworks for learning new material often difficult.
Anatomy Education for Athletic Training Students at Duquesne University -- Challenges

• Instructor: Provide examples for methods to organize material for learning, take class notes into lab to help with identification (concrete) and clinical significance (formal)
Anatomy Education for Athletic Training Students at Duquesne University -- Opportunities

- Most AT students interested in orthopedic and biomechanics topics.
- Most AT students are people-oriented, so their lab work typically is collegial, and productive.
- Due to involvement with clinical experiences simultaneously, able to bring more clinical situations to lab.
Thank You!

- American Association of Anatomists, Annual Meeting Program Committee

- Colby Shultz, Meetings Manager