Incorporating a Research Experience into a Professional Graduate Program

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Objectives

- Discuss the benefits of students conducting research
- Identify the challenges associated with students conducting research
- Summarize the pros/cons of a full master's thesis
- Consider alternatives to the thesis
    Questions are welcome throughout

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Importance of a Research Philosophy

- Clinicians must understand research concepts to practice evidence-based medicine (Keeley, 2016; VanLunen, 2015)
- More than just reading the results of a study (Arnold, 2017)
  - Need to understand how to judge the quality of the methods
  - Need to understand the statistics, at least at a basic level, to understand whether or not the findings are clinically meaningful
  - Need to discern if the findings can be generalized to the clinician's current patients

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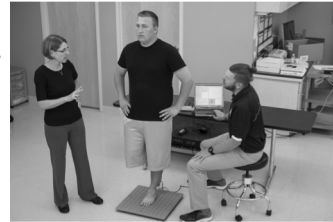# Research within the Curriculum

- Research should be woven throughout
  - Sensitivity/Specificity - evaluation
  - Numbers Needed to Treat – epidemiology
  - Cost analysis and healthcare informatics – management
  - Patient-reported outcome measures – therapeutic interventions
  - Formation of Clinical questions – PICO
  - Evaluation of research – PEDRO scale
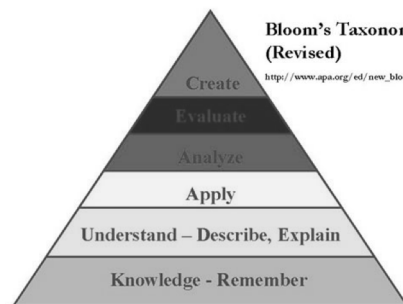
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Getting students involved

- Importance of Evidence-Based Practice
  - Systematic review of the evidence, combined with experience and expertise (Raab, 2016)
- One of the best ways to learn how to evaluate evidence is to learn how to conduct research (Arnold, 2005; Hurley, 2011)
  - Develop a clinical question
  - Design a research study to answer the question
  - Collect and analyze the data
  - Evaluate the study's limitations

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How to teach research

- How do we teach other skills?
- How do your students best learn?

Bloom's Taxonomy (Revised)
http://www.apa.org/ed/new_blooms.html

Create
Evaluate
Analyze
Apply
Understand – Describe, Explain
Knowledge - Remember

Based on an APA adaptation of Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001)

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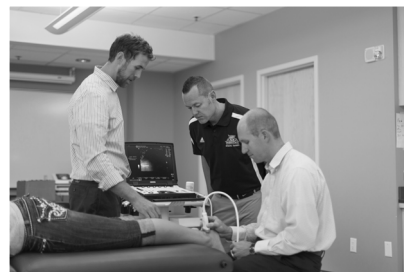
Need for Outcomes Research

- Who can best conduct patient outcomes research? Practicing clinicians!
- Why aren't practicing clinicians producing research on patient outcomes?
  - Time
  - Money
  - Knowledge of the process
  - Joy of research

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Many different options

- Full or Partial Master's Thesis Research Project
- Scholarly Projects
- Research embedded within the curriculum
  - CAT papers
  - Systematic reviews
  - Research methods course
  - Portions of the thesis

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Challenges of Requiring Research

- Sufficient number of faculty advisors
- Resources including equipment, supplies, faculty load
  - Research grants
- IRB timeline
- Delayed graduation = delayed certification/license
- Credit hours in program

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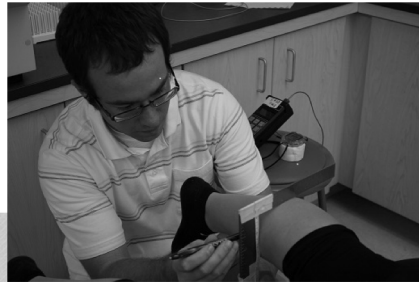
Challenges of Requiring Research

- Faculty Turnover/Sabbaticals
- Academic preparation of students
- Time-consuming for students
- Faculty expertise
- Getting other faculty (outside of AT) involved
- Required vs. optional
  - If optional, then other classes are likely needed
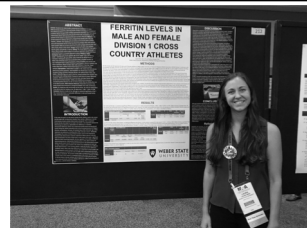
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Benefits of Required Research

- Challenging, graduate-level work
- Teach future clinicians how to conduct quality research studies
- Better understanding of and appreciation for the research process
- Opportunities for undergraduates to get involved in research

Benefits of Required Research

- Resume-builder – PhD
- Project to talk about during interviews
- Help faculty advance their research agendas
- Professional presentations
  - Bring recognition to program
  - Help faculty produce scholarship for tenure/promotion
- Networking
  - At conferences and with other researchers
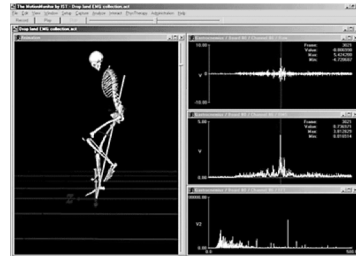
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Benefits of Required Research

- Research is FUN!
- Research is challenging!
- Research projects encourage faculty to collaborate between one another and across campus
- Provides an opportunity for Interprofessional Education (IPE) through collaborations

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Advanced Skill Application

- Phlebotomy
- Diagnostic Ultrasound
- Wireless EMG
- Video gait analysis
- Force plates for gait and balance
- Laboratory analysis
- Continuous Quality Improvement

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Group Research Projects

Independent work	Group work
• Each student writes own literature review	• Group defines the methods
• Beginning with data analysis, manages own dependent variable(s)	• Group writes IRB
	• Group collects the data together
• Writes own results/discussion	• Group may present data together or separately
• Individual oral defense	

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Alternatives:
Scholarly Project

- Very similar to the thesis, but students work in groups only – no individual projects
- Topics are assigned to each group based on faculty expertise
- Advantages – faculty manage fewer projects and all are in their area of expertise
- Disadvantages – may get less buy-in from students

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Alternatives: CAT Papers

- Critically Appraised Topic Papers
  – Students develop a focused clinical question
  – Use PICO to identify research studies
    Patients, Interventions, Comparison, Outcomes
  – Identify and search appropriate databases
  – Identify and use inclusion/exclusion criteria for studies, including level of evidence
  – Develop a clinical bottom line – implications for practice

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Other Alternatives

- Have students write a literature review, develop their methods, write an IRB, but then stop there.
- Provide students with a data set to analyze and develop results/conclusions
- Conduct small experiments in lab classes where everyone puts their data together and analyzes it as a group

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Conclusions

- There are many benefits to incorporating research into a professional graduate program
- There are many challenges to incorporating research into a professional graduate program
- A full thesis is one option
- Many other options are also viable
- The right option for your program depends on your faculty and your university

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Thank you

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