Implementation of a Clinical Affiliation Education Program for DPT Students
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Disclosure
• The authors have no formal disclosures or conflict of interest.
• Portions of these data were presented at the 2019 Combined Sections Meeting and 2019 TPTA Spring Conference

Overview
• Introduce clinical reasoning concepts in academics and clinical affiliations
• Describe a model for a clinical affiliation education program implemented within outpatient orthopaedic physical therapy (PT) setting
• Discuss student and clinical instructor perspectives of the clinical affiliation program
• Analyze barriers and limitations to application
About Us

• Matthew Webb, PT, DPT, OCS
  – DPT School: University of Tennessee Health Science Center
  – University of Tennessee Health Science Center Orthopaedic PT Residency

About Us

• Shantel Phillips, PT, DPT, OCS
  – DPT School: Azusa Pacific University
  – Kaiser Permanente Southern California Orthopaedic PT Residency
  – Kaiser Permanente Southern California Movement Science Fellowship
  – Vanderbilt Sports PT Residency Mentor

Clinical Motivation

• The introduction of Vanderbilt Sports PT Residency program prompted reflection on our previous residency learning experiences
• Maybe the same framework could be utilized in DPT clinical education to improve orthopaedic specialty practice knowledge

Can we simulate an orthopaedic residency model during a DPT student’s clinical rotation?
Clinical Education

• Expanded role of clinical education and clinical instructors
  – Increased length of DPT clinical rotations coupled with increased level of competency and less supervision expected at graduation
• Length of rotation
  – 2001 29 weeks
  – 2007 33.6 weeks (range 20-55 weeks)
  – 2011 31.2% of physical therapy curriculum

Sass, K. Journal of Physical therapy Education 2011

Clinical Reasoning

• Highly complex and reflective skill and process involving critical thinking
  – Engages and encourages patient collaboration in mutual decision making
  – Develops over time
  – Requires substantial amount of practice
  – “RED FLAG” performance item on CPI

Huhn et al. 2018, Furze et al. 2015

Clinical Reasoning in Academia

• Christensen et al. (2017) explored how clinical reasoning is taught in entry-level PT programs
• 90.6% integrated clinical reasoning into coursework
• 29.2% had a separate clinical reasoning course
• 94.8% of programs used multiple methods

Christensen et al. Phys Ther 2017
Role of Clinical Instructors

- Clinical affiliations provide mentoring during patient experiences to improve performance
  - Developing clinical reasoning is “highly contingent on clinical experience.”
- Clinical Instructors (CIs) support the student’s clinical reasoning development

Clinical Reasoning in Clinical Affiliations

  - 91% of CIs reported they explicitly taught clinical reasoning to their students
  - 71% of CIs felt students were adequately prepared by academic programs in clinical reasoning
  - Respondents suggested PT education programs help students by providing more patient simulations, mentoring programs, more clinical fieldwork, specific courses, and other
- Additional methods suggested to facilitate clinical reasoning skills include: experience, learning in didactic curriculum, engaged discussion, and integration

Integration – The “Holy Grail”?

- “Collaboration between academic and clinical learning sites to meet common learning objectives”
- Consistency between classroom and clinic
- Accelerate clinical reasoning skills to/from classroom and clinic
The Challenge We Encountered

• DPT students were overwhelmed by a high-level and fast-paced environment
• CIs struggled with adequately covering orthopaedic content
• Disconnect between learning in PT school and clinical practice

The Purpose

• Develop and evaluate a clinical affiliation education program for improving DPT student clinical reasoning in orthopedic physical therapy

Vanderbilt Orthopaedics Nashville

• Part of level 1 trauma hospital and in close proximity to trauma, sports medicine, orthopaedic surgeon/physician offices
• Large staff divided into treatment teams
• Sports PT Residency program
  • 4/9 CIs mentor in program
Vanderbilt Orthopaedics Nashville

Medical Fitness Center

Conference Rooms

Vanderbilt Orthopaedic Institute

DPT Student Rotations

- Vanderbilt University Medical Center accepts an average of 15 PT/PTA students each year, among 3 outpatient orthopaedic clinics
- Vanderbilt Orthopaedics Nashville accepts an average of 8 full-time DPT students

Traditional Clinical Affiliation Model

CLINICAL INSTRUCTOR

@student

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Clinical Affiliation Education Program

- Program aimed to:
  - Enhance orthopaedic specialty practice knowledge, skills, and clinical reasoning
  - Promote evidence-based PT behaviors
  - Demonstrate effectiveness in spite of busy outpatient clinics
  - Provide a standardized framework that can be scalable across a variety of clinical settings
Program Emphasis

- Highlights key DPT education concepts
- Integrates:
  - Clinical Practice Guidelines
  - Current Concepts of Orthopaedic Practice
  - Treatment-based algorithms
- Standardize patient care across students
- Introduce movement-based concepts

Our goal for DPT students

- Provide DPT students with the essential clinical knowledge, skills, and reasoning for evaluating and managing patients with any orthopedic condition regardless of complexity

Program Characteristics

<table>
<thead>
<tr>
<th>PROGRAM CHARACTERISTICS</th>
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<tbody>
<tr>
<td>Clinical reasoning</td>
<td>• Pre- and post-curriculum quizzes</td>
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<tr>
<td></td>
<td>• Short clinical reasoning forms during patient evaluations for reflection in action</td>
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<tr>
<td></td>
<td>• Long clinical reasoning forms (CI prep forms) during case discussion classes for reflection on action</td>
</tr>
<tr>
<td>Content knowledge</td>
<td>• Weekly 1 hour power-point lectures with up-to-date clinical practice guidelines (Table 2)</td>
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<tr>
<td></td>
<td>• Clinical skills labs</td>
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<td>• Handouts provided each class</td>
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</table>
Program Implementation

- Lectures/labs conducted over lunch period
- Short Clinical Reasoning Forms used with CI
- Additional Reasoning Forms used with program facilitators

Weekly Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>12-Week Program</th>
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<tbody>
<tr>
<td>1</td>
<td>Clinical Reasoning #1</td>
</tr>
<tr>
<td>2</td>
<td>Shoulder</td>
</tr>
<tr>
<td>3</td>
<td>Movement Upper Quarter</td>
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<tr>
<td>4</td>
<td>Upper Cervical</td>
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<tr>
<td>5</td>
<td>Lower Cervical</td>
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<tr>
<td>6</td>
<td>Clinical Reasoning #2</td>
</tr>
<tr>
<td>7</td>
<td>Lumbar/SI</td>
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<tr>
<td>8</td>
<td>Knee</td>
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<td>9</td>
<td>Hip/Movement Lower Quarter</td>
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<tr>
<td>10</td>
<td>Gait</td>
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<tr>
<td>11</td>
<td>Chronic Pain</td>
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<tr>
<td>12</td>
<td>Clinical Reasoning #3</td>
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</tbody>
</table>

Clinical Reasoning Content

- What is clinical reasoning?
- Deductive and inductive reasoning
- Therapeutic alliance
- Identifications of SINSS and ICF classifications
- Practice clinical reasoning forms
- Grand Rounds
### Body Regions Content

- Shoulder, Knee, Hip, Lumbar Spine, SI Joint, Cervical Spine
- Key subjective information eg: red flags, clinical pearls, common descriptors
- Special tests utilizing test clusters
- Handling techniques
- Clinical prediction rules
- Treatment-based classifications

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### Movement Content

- **Upper Quarter**
  - Identification and nomenclature of scapular dyskinesis
  - Practice manual facilitation to improve specific scapular dyskinesis
  - Review treatment interventions for specific syndrome

- **Lower Quarter**
  - Identification and nomenclature of femoral glide
  - Practice manual and verbal cues
  - Review exercise interventions for movement coordination

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### Week Topic Content

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction and Clinical Reasoning</td>
<td>Discuss student expectations, Subjective exam: taking an effective patient history, Establish pain behavior, Exam clinical reasoning items, ICF (Impairment, disability, activity, participation)</td>
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<tr>
<td></td>
<td></td>
<td>SINS (Severity, Irritability, Nature, Stage)</td>
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<td></td>
<td></td>
<td>Case study practice</td>
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<tr>
<td>2</td>
<td>Shoulder Special Tests</td>
<td>Review key subjective information, all that matters, red flag review</td>
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<tr>
<td></td>
<td></td>
<td>Practice hands-on techniques to become proficient in performing special tests</td>
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<td></td>
<td></td>
<td>Choosing manual skills</td>
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<tr>
<td></td>
<td></td>
<td>Identify the test clusters</td>
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<tr>
<td></td>
<td></td>
<td>Instability tests (SLAP, Bankart, MDI)</td>
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<tr>
<td></td>
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<td>Biceps tests</td>
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<td>Rotator cuff testing</td>
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<td></td>
<td></td>
<td>Abduction testing</td>
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<td></td>
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<td>Posterior muscle length testing</td>
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<tr>
<td></td>
<td></td>
<td>Upper arm</td>
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<tr>
<td></td>
<td></td>
<td>Forearm</td>
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<tr>
<td></td>
<td></td>
<td>Trunk</td>
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<tr>
<td></td>
<td></td>
<td>Pelvis</td>
</tr>
<tr>
<td>3</td>
<td>Evaluation and Treatment of upper quarter movement dysfunction</td>
<td>Identification and nomenclature of scapular dyskinesis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anterior tilt</td>
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<tr>
<td></td>
<td></td>
<td>Downward rotation syndrome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abduction syndrome</td>
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<tr>
<td></td>
<td></td>
<td>Depression syndrome</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Functional reach component specific scapular dyskinesis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Review treatment interventions for specific syndrome</td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
<td>Content</td>
</tr>
<tr>
<td>------</td>
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</tr>
</tbody>
</table>
| 4 | Evaluation and Treatment of neck pain with headaches and neck pain with movement coordination dysfunction | Review key subjective terms.  
Review red flag symptoms.  
Review movement coordination dysfunction.  
Practice TIPPS.  
Practice gapping.  
Practice active straight leg raise.  
Practice supinator sign.  
Practice minor muscle test.  
Practice contractile position.  
Practice analgesic position. |
| 5 | Evaluation and Treatment of neck pain with mobility deficits and neck pain with referred pain | Review key subjective terms.  
Review red flag symptoms.  
Review characteristics of neck pain with mobility deficits.  
Practice upper cervical C0–1 C2–3 spine joint mobilizations.  
Practice P–A mobilizations.  
Practice upglides.  
Practice down glides.  
Practice side glides.  
Review examination techniques for neck pain with referred pain.  
Spurlings.  
Distraction.  
ULTTA.  
Reflex testing.  
Hoffman's.  
Babinski.  |
| 6 | Evaluation and Treatment of SIJ and Low back pain with referred pain, mobility deficits, movement coordination impairments | Review key subjective terms.  
Review red flag symptoms.  
Review objective tests.  
Thigh spring.  
Sacral spring.  
Compression.  
Gapping.  
Active straight leg raise.  
Review treatment-based classifications for low back pain.  
Manipulation.  
Stabilization.  
Traction.  
Specific exercise.  
Self-care.  
Central sensitization.  
Self-care.  |
| 7 | Evaluation and Treatment of lower quarter movement dysfunction | Review key subjective terms.  
Review red flag symptoms.  
Identify movement dysfunction at the hip.  
Femoral anterior glide.  
Posterior glide and medial hip rotation.  
Adduction and medial rotation.  
External rotation syndrome.  
Discuss signs and symptoms of hip pain.  
Discuss hip pathology and hip pain.  
Discuss treatment strategies for hip pain.  
Practice verbal and manual cuing techniques.  
Practice exercise interventions to improve movement coordination.  |
| 8 | Chronic pain | Review Lorimer Mosley TED talk on chronic pain.  
Discuss signs and symptoms of chronic pain, fear avoidance beliefs, catastrophizing.  
Practice “Explain Pain” through role-playing techniques.  
Practice reflection.  
Practice misconceptions.  |
Clinical Reasoning Facilitation

- Modified from orthopaedic PT residency forms
- Quick and easy to integrate in a fast-paced setting (2 to 5 minutes) – debriefing session
- Students know questions CI will ask
- Provides organization and structure to overwhelming and complex conditions
- Allows CIs to GET A COMMITMENT from the students
- Builds student confidence having an agreed plan

Clinical Reasoning Short Forms

<table>
<thead>
<tr>
<th>Patient Name</th>
<th>Date of Birth</th>
<th>Allergies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jane Smith</td>
<td>1990-01-01</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>History:</td>
</tr>
<tr>
<td>Presenting Complaint:</td>
</tr>
<tr>
<td>Medical History:</td>
</tr>
<tr>
<td>Physical Examination:</td>
</tr>
<tr>
<td>Diagnostic Tests:</td>
</tr>
<tr>
<td>Treatment Plan:</td>
</tr>
</tbody>
</table>

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Clinical Reasoning Case Discussions

Clinical Reasoning Facilitation
Pre-visit discussion

SUBJECTIVE
Subjective form and discussion

OBJECTIVE
Objective form, reflection, and discussion

TREATMENT

Preliminary Evaluation of Program
Evaluation Metrics
• Pre- and post-quiz scores (knowledge)
• Student perceptions (reasoning/value)
  – 22-item survey
• CI perceptions (value/barriers)
  – 14-item survey

Participants
• Students
  – 19 DPT (53% female, 62% private institution, 46% R1 institution)
    • Data available from 10 students
• CIs
  – 10 CIs (60% female, 40% clinical specialists)

Orthopaedic Knowledge
Pre-curriculum score average=6.1. Post-curriculum score average =7.1.
Student Perceptions

- “The classes were beneficial in that they created good discussion about difficult patient cases while utilizing the CI prep forms.” (Student 3)
- “The cases you review help us critique our own reasoning skills and it also gives us a foundation in which we can build from as we go forward.” (Student 7)
- “I also enjoyed being challenged with different scenarios to think critically about different tissue involvement, primary impairments, and relaying all of this to the ICF model.” (Student 17)
- “The second part of the course aided in completing the [reasoning] form to see that I was on the right track in preparing a plan for a difficult patient.” (Student 19)

CI Perceptions

- Reflect the overall benefit and helpfulness of the program on reasoning and knowledge.
CI Perceptions

- Beneficial aspects of program
  - "Clinical reasoning has been much improved even if it’s just the students first exposure to things like ICF classifications, etc..."
  - "Hands-on skill labs is another component that is beneficial for students... sometimes students do not have time during patient care to go over these skills."

- Program Integration
  - "Getting other CIs involved. This would help with clinician buy in. They would be more willing to integrate it into their patient care."
  - "We need all CIs to be on the same page as what you are teaching and using the same clinical reasoning process... really need CIs to be brought up to this level of clinical reasoning and use the same lingo, etc, to better reinforce what is being taught to them."
CI Perceptions

• Program Barriers
  – “Inability to get an eval related to most recent class…”
  – “Schedules are sometimes full and hectic.”

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Evaluation Summary

• DPT students demonstrate improvement in orthopaedic knowledge
• DPT students report value with the curriculum and reflect improvement in clinical reasoning
• CIs report their students benefit from the program, however, are not directly involved with the program or facilitators

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### 2019 Updates to the Program

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>2016-2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Progressively build lecture material based on Current Concepts and Clinical Practice Guidelines</td>
<td></td>
<td>• Updated “Clinical Reasoning” and “Chronic Pain” powerpoints to stimulate more interaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Added “Knee” lecture</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre- and Post-Quizzes</th>
<th>2016-2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 9 questions for both pre- and post-rotation quiz</td>
<td></td>
<td>• Two sets of different 20 pre-rotation and 20 post-rotation quizzes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Reasoning</th>
<th>2016-2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Maintained previous short clinical reasoning forms and CI prep forms</td>
<td></td>
<td>• Revamped short clinical reasoning forms to add “Stability” into SINSS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Created a “Chart Review” form</td>
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<td></td>
<td></td>
<td>• Added Pre- and Post-Self-Assessment forms</td>
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<table>
<thead>
<tr>
<th>Student Feedback</th>
<th>2016-2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Feedback questions on each lecture class and overall</td>
<td></td>
<td>• Changed feedback form to assess changes in clinical reasoning and knowledge</td>
</tr>
</tbody>
</table>

### Added Pre- and Post-Assessment Forms

**Rate your performance in the following skills:**

- Professionalism
- Interview/history taking
- Differential diagnosis
- ICF classification
- Clinical reasoning
- Special testing
- Manual therapy
- Movement analysis
- Plan of care management
- Patient education
- Exercise prescription
- Chronic pain management

### Updated Student Feedback Form
I don't know if these next 3 slides are necessary but I put it in there. We can take it out if it is not needed.

Phillips, Shantel L, 6/14/2019
Limitations of Data

- Small sample size
- Lack of formal clinical reasoning assessment
- No measurement of clinical behaviors or outcomes

Limitations in Implementation

- Limited time
  - CIs unable to participate in class series
  - Limited time to debrief students and practice techniques
- Inconsistent use of same tactics and terminology between CIs and what is taught in program
- CIs used varying clinical reasoning strategies

Proposed Enhanced Clinical Affiliation Model
**Enhanced Clinical Affiliation Model Reality**

**Lessons Learned**
- Amount of personal time devoted to development
- Higher level of engagement from students than anticipated
- Interaction with CI and student did not carry through as anticipated
- Less interaction between CIs and program facilitators

**Future Implications**
- Enhance CI participation
  - CI attendance in program lectures/labs
  - Review clinical reasoning forms with CIs
  - Provide summaries of content covered to CIs following each module
  - Engage with administration to improve integration
  - Communication regularly (i.e., instant messages) with CI regarding DPT student performance/needs
Future Implications

• Assessing outcomes
  – Compare student outcomes with satellite clinics
  – Compare student outcomes to acute care DPT students

• Scalable?
  – CI willingness to take personal time to develop curriculum
  – Mentoring/residency experience

Conclusion

• Implementing a structured clinical affiliation education program in a high-volume outpatient clinic is feasible

• Students demonstrated an average improvement of 1 point from the beginning of the curriculum to the end of the curriculum

• Preliminary feedback indicates the program is beneficial for DPT student clinical reasoning especially for complex patients

Conclusion

• CIs express support for student involvement and perceive the program to be beneficial

• There is a need to integrate educational content into clinical care to enhance student learning and address barriers for CI participation
Student Participation Survey

- Students were provided with a twenty-two-item survey consisting of:
  - Eleven items from a Likert scale (strongly disagree to strongly agree)
    - Pertaining to the benefit of each class that the students participated in
  - Eleven items were open ended questions to provide descriptive feedback on ways to improve each class
CI Survey

- Clinical instructors were provided a 14-item questionnaire to assess their perceptions of the student curriculum.
- Included questions regarding:
  - the level of involvement in the program and with clinical coordinators
  - Perceived helpfulness of the clinical of the program improving student specialty knowledge and reasoning
  - Overall student benefit
- Open ended questions asked about important aspects of the program, suggestions for better integration, and barriers for CI and student involvement.

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