Assessment of an Integrative Longitudinal Case-Based Learning Model as a Curriculum Strategy to Enhance Teaching and Learning

Indiana University
School of Health and Rehabilitation Sciences
Department of Physical Therapy
Doctor of Physical Therapy Program

Welcome to the “Family”

Integrated Longitudinal Case-Based Learning Team
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Acknowledgments
- Jamie Grogg, DPT
- Lynn Taylor-Glass, DPT
Outline

- Development of the instrument: “IU DPT Case Family Tree”
- Evolution of the model: “Integrated Case-Based Learning Model” (ILCBL)
- Outcomes (Phase I)
- Limitations and future directions (Phase II)

Overall Development & PRAC Support

**Instrument**
**Family Tree**
“PHASE I”
PRAC Grant 2010

**Model**
ILCBL
“PHASE II”
PRAC Grant 2012

**PRAC 2010 (Phase I)**
Course & Instrument Development
System Logistics
Individual Application & Dissemination

**PRAC 2011 (Phase II)**
Curricular & Model Development
Direct Assessment
Collaboration & Dissemination
The "Family" History

WHY?
Initially developed to help individual faculty with facilitating students':
•problem-solving & clinical decision making skills
•cultural & ethical competence
•preparation for entry-level clinical practice

The IU DPT Family Tree
An Integrated Case Series
Second Edition

2 families; 4 generations; 37→45 Inter-Related Cases
Copyrighted; Multi-cultural; Life Span; Practice Patterns

IU DPT Family Tree
**Biography Example**

**‘Troy Coleman’**

- **Age:** 25
- **Gender:** Male
- **Race:** Caucasian
- **Work History:** Troy is a factory worker and has been working with the same company since graduating from high school.
- **Living Environment:** He lived with his wife in a modest home in the country until the divorce. After his wife left, he moved into a friend’s third story 2-bedroom apartment.
- **Social History:** He had married his high school sweet heart right after graduation. After six years of marriage, his wife abruptly left him without an explanation.
- **Lifestyle:** He does not exercise because his job is physically demanding and he is worn out by the time he’s finished with work. The last thing he wants to do when he gets home is work-out. After his wife left, he started drinking up to 10 beers/day on the weekends, sometime alone and sometimes with friends.

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**Implementation Example**

- **Old scenario**
  - You new patient is a 25-year-old man who presents with a right anterior cruciate ligament autograft reconstruction. He is 5’11” and weighs 185 lb. His resting blood pressure is 116/76 mmHg and his lipid profile is total cholesterol of 185 mg/dL, LDL of 110 mg/dL, and HDL of 56 mg/dL. His fasting glucose is 89 mg/dL. His grandfather died of heart disease at the age of 75.

- **New scenario**
  - Troy Coleman is a 25-year-old man who presents with a right anterior cruciate ligament autograft reconstruction. He is 5’11” and weighs 185 lb. His resting blood pressure is 116/76 mmHg and his lipid profile is total cholesterol of 185 mg/dL, LDL of 110 mg/dL, and HDL of 56 mg/dL. His fasting glucose is 89 mg/dL. His grandfather died of heart disease at the age of 75.
  - **Work History:** Troy is a factory worker and has been working with the same company since graduating from high school.
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Evolution of the Innovative ILCBL Model

*Concept supported by the literature*

- **Single Case Methodology**
  - Valuable learning tool
    - Improved problem solving skills
    - Increased enthusiasm for learning
    - Greater independence
  - Talmage DA. *Journal Chiropractic Education*. 2001; Schwartz PL, Egan AG, Heath CJ. *Acad Med.* 1994

- **Longitudinal Case Design**
  - Single classroom application with progressive application of symptoms
    - More patient-centered analysis
    - High satisfaction with classroom interactions
    - Realistic continuity

- **Extended Family Case Design**
  - Family Tree Orientation
    - Students engaged in aspects dealing with Ethics, Psychosocial considerations, Social responsibility
    - Greater integration of curricular content
Integrative Evolution of the Model

- Psychosocial
- Multicultural
- The Whole Person
- Interpersonal
- Ethical

Longitudinal Evolution of the Model

- Health: Disease Progression, Aging, Secondary complications
- Personal: Familial relationships, Personal history, Ethical and social constructs

Across Courses Across Semesters Transitioning From Classroom to Clinic
ILCBL Strategic Development

1. Target curricular objectives
2. Identify specific cases for integration (6)
3. Develop longitudinal case progression
4. Attach specific learning objectives to the case progression
   - Consider all domains of learning
   - Consider course objectives
5. Identify course implementation
   - Develop an application matrix
   - Course instructor responsible for application

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### Case Family Integration & Implementation Across the Curriculum

#### The ‘Matrix’

<table>
<thead>
<tr>
<th>Case</th>
<th>Semester 1 Fall First-Yr</th>
<th>Semester 2 Spring First-Yr</th>
<th>Spring 3 Fall 2nd-Yr</th>
<th>Semester 4 Spring 2nd-Yr</th>
<th>Semester 5 Fall 3rd-Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course</td>
<td>P01 (Clinical Decision Making)</td>
<td>1911 Exam and Intervention I</td>
<td>1920 Exam and Intervention II</td>
<td>1908 Health Promotion</td>
<td>1932 Legal and Ethical Issues of PT</td>
</tr>
<tr>
<td>Content</td>
<td>Introduction</td>
<td>Carpel Tunnel Syndrome</td>
<td>Di = CMC</td>
<td>Risk factors for cardiac involvement</td>
<td>Benefits: Barrett</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Her son diagnosed with CP (Finn)</td>
</tr>
<tr>
<td>Course</td>
<td>Polo-Therapeutic Di &amp; Nutritional</td>
<td>1943 Pedobehavioral Interventions of PT</td>
<td>1924 Cardiology Practice</td>
<td></td>
<td>1969 Special Topics</td>
</tr>
<tr>
<td>Content</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Carpel Tunnel Syndrome</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Polypehrology</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Content</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td>Breast Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content</td>
<td></td>
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</tr>
</tbody>
</table>

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8/13/2018
A Targeted Case Sample
Daleela Jafari

<table>
<thead>
<tr>
<th>Class</th>
<th>Course Content</th>
<th>Learning Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>P511</td>
<td>Clinical Decision Making</td>
<td>Application of CDM models in POC design</td>
</tr>
<tr>
<td>P515</td>
<td>Examination I</td>
<td>Patient interview and functional mobility</td>
</tr>
<tr>
<td>P530</td>
<td>Clinical Pathophysiology</td>
<td>Pathophysiology of osteoporosis</td>
</tr>
<tr>
<td>P526</td>
<td>Examination II</td>
<td>Spinal tests &amp; measures</td>
</tr>
<tr>
<td>P646</td>
<td>Therapeutic Exercise</td>
<td>Treatment design &amp; prescription</td>
</tr>
<tr>
<td>P643</td>
<td>Psychosocial</td>
<td>Cultural competency</td>
</tr>
<tr>
<td>P622</td>
<td>Musculoskeletal</td>
<td>Spinal fusion, post surgical management</td>
</tr>
<tr>
<td>P660</td>
<td>Selected Topics</td>
<td>Complex management &amp; cultural proficiency</td>
</tr>
</tbody>
</table>

“It's all in the family...”
Outcomes (Phase I)

- Journal Article
  - Feitelberg Journal
  - Founders’ Award
- Multiple Presentations
  - Local
  - National
- At least 9 other university programs adopting case family

### COURSE RELATED OUTCOMES

Student Affirmative response rates for survey questions [Likert Scale (1-5)] concerning use of the Family Tree within individual courses across a single semester

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>PS11</th>
<th>P643</th>
<th>P532</th>
<th>AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The integrated case series facilitated consideration of multiple aspects of patient care.</td>
<td>96.8%</td>
<td>93.9%</td>
<td>88.0%</td>
<td>92.9%</td>
</tr>
<tr>
<td>2. The integrated case series facilitated consideration of psychosocial issues related to patient care.</td>
<td>80.6%</td>
<td>90.9%</td>
<td>92.0%</td>
<td>87.8%</td>
</tr>
<tr>
<td>3. The integrated case series facilitated consideration of diversity issues, including race, culture and lifestyle, involved in patient care.</td>
<td>67.7%</td>
<td>90.9%</td>
<td>92.0%</td>
<td>83.5%</td>
</tr>
<tr>
<td>4. Recommend use in this course in the future.</td>
<td>90.3%</td>
<td>69.7%</td>
<td>84.0%</td>
<td>81.3%</td>
</tr>
<tr>
<td>5. The integrated case series facilitated consideration of patient care across the lifespan.</td>
<td>64.5%</td>
<td>90.9%</td>
<td>73.3%</td>
<td>76.2%</td>
</tr>
<tr>
<td>6. Overall, the Integrated case series facilitated learning.</td>
<td>83.9%</td>
<td>72.7%</td>
<td>72.0%</td>
<td>76.2%</td>
</tr>
<tr>
<td>7. Recommend using the cases in other courses in the curriculum.</td>
<td>89.6%</td>
<td>66.7%</td>
<td>73.0%</td>
<td>73.4%</td>
</tr>
<tr>
<td>8. The integrated case series facilitated consideration of the legal, ethical and economic aspects of patient care.</td>
<td>58.1%</td>
<td>69.7%</td>
<td>92.0%</td>
<td>73.3%</td>
</tr>
<tr>
<td>9. The integrated case series facilitated development of clinical decision making abilities.</td>
<td>87.1%</td>
<td>57.6%</td>
<td>72.0%</td>
<td>72.3%</td>
</tr>
<tr>
<td>10. The integrated case series facilitated development of critical thinking and problem solving skills.</td>
<td>80.6%</td>
<td>51.5%</td>
<td>80.0%</td>
<td>70.7%</td>
</tr>
<tr>
<td>11. Cases from the case series were used frequently during this course.</td>
<td>71.0%</td>
<td>53.8%</td>
<td>84%</td>
<td>69.6%</td>
</tr>
</tbody>
</table>

**AVERAGE FOR INDIVIDUAL COURSES**

| AVERAGE | 78.2% | 73.5% | 82.0% |
**STUDENT CLINICAL EDUCATION COMMENTS**  
Clinical Education Outcomes from On-Line Discussion Forum

| "Using the case family book allows us to more specifically consider all aspects of a person’s life and health before trying to make decisions about the best plan of care for that patient...which greatly impacts how long they need to stay in the unit and what level of independence they need to achieve.” |
| "The most instrumental way that the case studies impacted my clinical rotation is learning how families, friends, and medical providers interact, and how the patient’s history with each of these could impact the course of therapy.” |
| "I feel the cases in the family tree helped me to practice pulling together a patient’s full picture. My initial instinct throughout the first year of school may have been to stay ‘within the box’ and only worry about what was physically wrong with a patient. Introduction to the person as opposed to the diagnosis is closer to real life situations. In my clinical now, I have noticed that it really takes an understanding of a patient’s psychosocial dimension to even effectively be able to initiate treatment.” |
| "In a way, using the case series prevented tunnel vision when looking at a patient’s condition.” |

**CONSTRUCTIVE COMMENT THEMES**  
Underuse; overuse; lack of consistent use

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**Faculty Based Outcomes**

1. Efficiency  
2. Authenticity (Realism)  
3. Multi-factorial considerations  
4. Student learning objectives  
5. Faculty collaboration
### Limitations

- Direct assessments of the model
- Difficult to isolate the true impact
- Without faculty buy-in it will not be successful
- Sustainability of the model – e.g. adjusting to curriculum changes, faculty turnover
- Consistent approach to application
- Purpose must be clearly introduced to students
- Does not replace “live patient” exposure

### Future Directions

**PRAC Grant 2012 (Phase II) ILCBL Learning Model**

- Continue to develop collaborative implementation of the ILCBL model and evaluate its effectiveness of promoting learning of material across a progressive curriculum *(case coordinator)*
- Strengthen exploration of “family ties”
- Evaluate classroom to clinic impact *(Phase III)*
- Add layers to interactive aspect – e.g. video clips, electronic clinical documentation records
- Assess use at other institutions
- Explore use as substrate for IPE→IPC
Thank You!

It's All in the Family!

Woohoo!!
Are we havin' fun!

If you have any questions, please do not hesitate to contact us!

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References