Clinical Education: Developing Clinical Reasoning

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Why doesn’t the student see the problem?

Clinician

It’s clear to me!

Student
“Novices are rule-governed. Experts learn to break rules.”

Gail Jensen, PT, PhD, FAPTA
Novice
- Rule Driven
- Analytic Reasoning
- Inability to filter or prioritize info

Advanced Beginner
- Determines relevant info based on past
- Analytic reasoning & Pattern Recognition
- Sees the Big Picture

Competent
- Emotional buy in feels responsibility
- Pattern Recognition of common problems
- Analytic reasoning for complex/uncommon problems
- Sees the Big Picture

Proficient
- Pattern Recognition – clinical problem solving seems intuitive
- Resorts to analytic reasoning for managing problems
- Comfortable with evolving situations
- Can tolerate ambiguity

Expert
- Intuitive problem solving, situational responses and management
- Notices the unexpected
- Clever
- Perceptive – discriminates misfit features for pattern

Master
- Practical Wisdom
- Beyond big picture
- Concern for right/wrong decisions
- Emotional Engagement
- Reflects in, on, for action

Dreyfus & Dreyfus Model of Skill Development Applied to Development of Physician Competence Carraccio, 2008
PT Students also evolve in their development!
Clinical Reasoning Models

Hypothetico-Deductive Reasoning
• Gather evidence
  • Hypothesis Testing
• Information Processing

Inductive Narrative Approach
• Pattern Matching (Chunking)
• Illness script

ANALYTICAL
Backward Reasoning

NON-ANALYTICAL
Forward Reasoning
Clinical Reasoning

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<th>EXPERIENCED CLINICIAN</th>
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<td>Non-Analytical Pattern Recognition (Chunk)</td>
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<td>Thinking</td>
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Prolonged effort/practice

Knowledge Organization: CI Role

• Build effective chunks (associate info)
• Optimize cognitive load to “free up” working memory
  • Provide worked examples (e.g. “solved” cases)
  • Start with common (classic) & gradually increase complexity
  • Limit feedback
• Be explicit: Explain How/Why of your pattern recognition
  • Make Invisible -> Visible
  • Think out loud -> Pause  *Slow down your thinking
• Have student identify errors/mistakes: Where is the lesion in the chunk?
  • Diagram their thinking
• Deliberate practice: See/Touch/Feel
  • Breakdown component parts
  • Give feedback

Working memory is needed for learning!
Knowledge Organization: Teaching Strategies to address faulty chunks

• Give time for the student to think (cognitive load)
  • “Pause for the cause”

• Find “common ground” & “point of departure”
  • Intermediate steps: signs/symptoms, problem lists, summary

• Create algorithms/flowcharts/concept maps

• Compare and contrast assignments

• Create prototypic patient assignments
  • Textbook case presentation

• Change key features in patient presentation: *What if?*

• Discuss essential concepts multiple times and in *differing* ways

• Use near peer instruction
Facilitating Clinical Reasoning in your students

• Communication of expectations
  • “strike zone”

• Pre-session Planning
  • Chart review
  • Summary of prior sessions
  • Patient goals for session
  • Student goals for session

• Signal for help
  • Predetermine a sign/word/look

• Think “Out loud”
  • Student
  • Therapist
Tools for Facilitating Clinical Reasoning

• ICF Model

• Reflection

• 5 Micro Skills for Clinical Teaching

• The 5-Minute Clinical Manager

• The Physical Therapy Clinical Reasoning & Reflection Tool
International Classification of Functioning, Disability and Health (ICF) model of functioning and disability
The Reflective Practitioner: Donald A. Schon (1982)

Key questions to facilitate reflection

• Reflection on-action – following an event and thinking back upon the encounter

• Reflection in-action – during the event making changes in behavior in response to the situation

• Reflection for-action – making changes for the future based upon previous
Gibbs’ reflective cycle encourages systematic thinking about the phases of an experience or activity using the headings to structure the reflection.
Five Microskills for Clinical Teaching


- Get a commitment – what is the pt’s problem?

- Probe for supporting evidence – why? What is the evidence?

- Teach general rules – teach pattern recognition

- Reinforce what was right

- Correct mistakes – create an environment where it is safe to admit to a mistake
THE 5-MINUTE CLINICAL MANAGER
A Method for Efficient Evaluation and Feedback

Strategy for efficiently structuring an interaction with a learner.

• **Step 1:** 1-minute learner commitment; establishing goals

• **Step 2:** 1-minute rationale evaluation: probe for supportive findings/evaluate the thinking leading to that commitment

• **Step 3:** Step 3: 1-minute praisings: reinforce what was correct/give positive feedback

• **Step 4:** 1-minute reprimands; constructive guidance about errors or omissions

• **Step 5:** 1-minute take home lesson; teach a general principle


Reflection Points: (Questions)
I. Initial Data Gathering/Interview
II. Generation of Initial Hypothesis
III. Examination
IV. Evaluation
V. Plan of Care
VI. Interventions
VII. Reexamination
VIII. Outcomes
IX. Mentor Feedback

Guide to Physical Therapist Practice + ICF
II. Generation of Initial Hypothesis
a. Body Structures/Function
b. Impairments
c. Activity Limitations
d. Participation Restrictions

Reflection Points:
• Can you construct a hypothesis based on the information gathered?
• How did you arrive at your hypothesis?
• What is your strategy for the examination?
• How might the environmental factors affect your examination?

IV. Evaluation
a. Diagnosis
b. Prognosis

Reflection Points:
• How did you determine your diagnosis?
• How did you examination findings support/negate your initial hypothesis?
• What factors might support/interfere with the patient’s prognosis?
• How can you determine capacity for progress toward goals?
MENTORSHIP

Ongoing self-assessment and reflection on teaching abilities in mentors is important to advance mentorship

• Questions to ask self:
  • Am I intervening too often or too little
  • Am I providing clear feedback
  • What can I do to make the student more comfortable with the mentoring process
  • Am I creating a collaborative mentoring environment
  • Did I consider the background information on the learner
  • Am I utilizing the teaching tools effectively
    • Modeling my clinical reasoning – Talking out loud
    • Facilitating clinical reasoning of the student
References


• Carraccio C, Benson B, Nixon J, Derstine P. From the educational bench to the clinical bedside: translating the Dreyfus developmental model to the learning of clinical skills. Acad Med. 2008; 83:761-767.


