Shaping Clinical Reasoning:
A Collaborative Approach Using Varied Case Reports and Vignettes for Entry-level and Fellowship Students.
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Objectives
• By the end of this presentation, the learner will:
  • Describe metacognition and explain techniques that the student can use to develop metacognition.
  • Explain several ways to incorporate clinical reasoning case reports into entry level and fellowship curricula.
  • Describe how videotape and interactive learning platforms can be utilized to give feedback on clinical reasoning processes.
  • Recognize the role of clinical instructor, clinical faculty, and small group facilitators in guiding clinical reasoning.
  • Identify pitfalls and errors in student reasoning and what to do to ensure a helpful learning environment.

Clinical Reasoning
• Clinical Reasoning: thinking and decision making associated with clinical practice that enables therapists to take the best-judged action for individual patients
  • Hypothetico-deductive: Hypothesis testing for diagnosis/management
  • Pattern recognition: Associate current problem with pattern for management
  • Narrative: Collaborative reasoning between patient and clinician for management

Jones and Rivett, 2004

Metacognition
“Being aware of one’s cognitive processes and exerting control over these processes” (Higgs and Jones, 2000)

The ability to think about one's clinical reasoning, and being able to modify one's behavior based upon this awareness.

Often seen as a progression toward mastery level and indicates that the student is able to use a hypothetico-deductive model reasoning process (Rushton, 2009)
However, today we want to:

• Explore how to improve clinical reasoning and metacognition through pattern recognition and the "lowly" case report
• Show that pattern recognition really is more of a mastery level skill when you reason in different hypotheses categories simultaneously
• Outline how to integrate case reports into Physical Therapy education—at entry level, residency, and fellowship level.

Hierarchies of Evidence—Why the Case Report?

1. Case reports allow for individual patient considerations whereas they may be excluded from an RCT.
2. Case reports can give more detail to examination and treatments.
3. Case reports can explore more of the "why did I pick this specific diagnostic test, treatment procedure, etc., to fit the patient case."
4. Case reports can "tell the patient’s story".

Narrative Reasoning

• The patient’s interpretation of his/her unique story
• "Construction of Meaning"
• Choice of what is expressed, what is emphasized, and what is not expressed
• Gains insight into the patient’s experiences of disability, pain, beliefs, feelings, health behaviors.
• Affects patient’s ability to learn and their learning styles
• Affects treatment choice
• Validated by consensus between patient and therapist.

How does your student learn?

3 Broad Categories

• Three categories of mental representation
  1. Basic science
  2. Formal knowledge of disease probabilities, scripts, and schemas

• Conclusion: “the more important finding is that focusing instruction on one processing strategy or another may be less important than engaging students with many problems, which are carefully sequenced to optimize learning and transfer.”

Another story.....

• Determining irritability is a skill that develops with clinical reasoning and experience.
Entry Level DPT Years 1-3

- Didactic Learning through “paper” or virtual patients
  - Use of Learning Platform like D2L, Blackboard

- Pattern Recognition Notebooks
  - Based on didactic material/textbooks/Clinical guidelines
  - Additional Pattern Generation during clinical rotations

- Selection of Case Report patient during clinical rotations
  - Guided by clinical instructor
  - Written case report 2nd year
  - Oral defense case report 3rd year

“Paper” patients

- Designed case based upon a real patient or a well known clinical pattern or common diagnosis.
- “Learn as you go” format
- Reproducible and low cost
- Limited visual unless videos are incorporated into the case

- Use of 2nd year students to simulate paper patients for 1st year
  - Refines interview skills with practice
  - Transfers to clinical practice with real patients

- Second year students then have more in depth discussions for examination and management, home setting, etc.
- Meet with expert clinician and peers to discuss case as it progresses.
  - Can be interdisciplinary peers

Virtual Patients in Primary Care

- Swedish Qualitative Study of 3rd year medical school students
- Interactive case study on a virtual learning platform
- Videos of standardized patient and primary care MD embedded in case
  - 5 sections (see next slide)

- Reflections in each section
  - Generally positive learning experience reported
  - Intermediate activity between didactic theory and real patients

Pattern Recognition Notebooks

- Use of clinical reasoning forms for visualizing pain referral patterns, reasoning in different hypothesis categories, and management
- Common diagnoses and patterns at first → didactic
- Clinical patients when student goes on rotation → reflection on action
  - Allows organization of patterns
    - Visual learners and mathematical/logical learners

Virtual Patients Key Points cont.

1. Preformulated comments based on EBP presented as text for case
2. Text and video used for learning and collaboration
3. Hyperlinks embedded in case
4. Open ended questions allow free text answers by student
5. Reflective thought guided by a virtual “tutor”.
6. Student able to visualize and read communication (both verbal and nonverbal) between patient and health care provider
7. Reflection-in-action emphasized throughout culminating in reflection-on-action

[Salminen, 2014]
Another Story.....

- Identifying motivation for the patient and psychological factors may be more important than the impairment itself.

Hypotheses Categories

- Activity and Participation Capabilities/Restrictions
- Patient's perspectives and beliefs/psychosocial factors
- Physical impairments and associated structure/tissue sources
- Pathobiological Mechanisms
- Contributing factors
- Precautions and Contraindications
- Management and Treatment
- Prognosis

Jones and Rivett, 2004

Case Report

- Actual writing of case report
- Can fulfill CAPTE requirements (entry level) and also demonstrate clinical reasoning in clinical setting
- Merging of didactic and clinical education
- Case report selection is critical
- Promote professionalism
- May need to assist student by finishing case and/or data collection
Selection of Case Report (cont.)

• What can you do as a clinical educator to ensure student success with case report selection?
  • Unique diagnosis or presentation or treatment approach
  • As complete course of care as possible
  • Use an outcome measure
  • Take good notes/records while maintaining HIPAA
  • Guide selection of tests and treatments with evidence if possible
  • This is where we shape clinical reasoning
  • “What makes this case interesting? What is my angle to discuss?”

Writing Case Reports

• Break into sections
  • Lit Review
  • Case Description, Outcome Measures, Examination, Intervention
  • Clinical Impression(s)
  • Background and Purpose
  • Outcomes, Discussion, and Conclusion
  • Abstract when case is final/complete
• Mixed media to introduce writing technique/material
  • Meet to review with peers and/or faculty facilitator
  • Weekly, Biweekly, Monthly
  • Writing on a Timetable

Case Defense

• Oral defense of case that is based upon written report
• Case report selection during clinical rotations
• Displays oral communication skills in entry level, residency, and fellowship trained students
• Presented to peers, clinical faculty, and clinical educators
• Can be poster presentation at conference

Errors in clinical reasoning in entry level and beyond

• Faulty perception or elicitation of cues
• Deficiency in basic clinical skills
• Incomplete factual knowledge about a disease process or clinical condition
• Deficiency in content knowledge
• Misapplication of known facts to a specific problem
• Incorrect use of heuristics
  • i.e. Mechanical Diagnosis and Therapy applied to all patients with low back pain.

A final story

• Second year student with a patient with low back pain.
• “I really thought I should extend him. But it worsened his pain and it stayed worse.”
• “We were taught McKenzie theory as our low back pain framework. It blew my mind that he would get worse if I extended him.”

Entry Level to Residency to Fellowship

• Should demonstrate a progressively deeper body of knowledge
• More ability to reason in different hypothesis categories
• More ability to reason using dual processing
• More ability to treat patient with different theories
• More ability to explain and defend reasoning using different theories
• Can use vignettes, clinical patterns, written case report, and case defense in all three levels of Physical Therapy education
Errors in Clinical Reasoning

Carol A Courtney

Errors in Clinical Reasoning

• Availability
  - Tendency to judge diagnoses as more likely if they are more easily retrievable from memory

• Base rate neglect
  - Tendency to ignore the true rate of disease, and pursue rare but more exotic diagnoses

• Confirmation Bias
  - Tendency to seek data to confirm, not refute the hypothesis.

• Premature closure
  - Tendency to stop too soon without appropriate consideration of alternative possibilities
  - ‘Salient distracting features’

Diagnostic error (medical)

Graber et al. 2005

• Analyzed 100 diagnostic errors
• Found an average of 5.9 cognitive errors per case
• Found 4 categories:
  - Faulty Knowledge (11 occasions)
  - Faulty Data Gathering (45)
  - Faulty Information Processing (159)
  - Faulty Verification (106)

Dual processing

• Intuitive (fast):
  - earlier in evolutionary development, and is rapid, contextual, holistic, and unavailable to introspection
  - Automatic formation of memories

• Analytical (slow):
  - abstract and inductive

Dual Processing

System 1 (Intuitive)
• experience-based and automatic
• consistent with memories of individual experiences
• access based on similarity between the present situation and prior experience

System 2 (Analytical)
• conscious, logical, and without context
• places heavy loads on working memory, and is energy-intensive

Intuitive Processing – Implicit Learning

1. Pattern recognition
2. Common-sense understanding:
   • identification of subtle trends;
3. Similarity recognition:
   • ability to recognize subtle likenesses to cues found in past episodes
4. Sense of salience:
   • identifying key pieces of information
   • Determining relevance versus irrelevance;
5. Deliberative rationality:
   • Selective attention to certain aspects or events
6. Skilled know-how:
   • Experiential knowledge, where the tools of a practical situation become an extension of one’s self.

Ken Randall Dissertation 2009
Analytical Processing

1. Hypothesis generation
2. Application of clinical prediction rules
3. Application of evidence based practice
4. Reflection

Which is better? Intuitive or Analytical?

Intuitive Processing

- “inherently flawed”
- Solution: slow down  
  Kahneman 2011
- Medical decision making may be different
  - Dependent on both systems
  - diagnoses are not reasoned so much as they are recognized  
  Monteiro and Norman 2013

Analytical Processing: Reflection in/on Action

- Valuable in the early stages of learning
- Reflection strategies explicitly mobilize analytical knowledge
  - Promotes greater ‘accessibility’ to knowledge base

What happens when intuition fails us?

- When signs and symptoms of a diagnosis do not fit:
  - Response not triggered
  - With recognition failure, System 2 (Analytical) will engage
- Alternatively:
  - clinician may act against better judgment and behave irrationally
  - Clinician rejects System 2, and defaults to System 1 (Intuitive)
  Coskerry and Norman 2008

Utilizing both Intuitive and Analytical Thinking

- Good decision makers consciously blend their processing styles
- Although System 1 (intuition) operates at an unconscious level, its output, once seen, can be consciously modulated by adding a System 2 (analytical) approach
- Engagement of System 2 may occur when it “catches” an error in System 1
  Risen and Gilovich 2007
Overconfidence

• Not always a bad thing?
• Leads to definitive action
• However,
  intuitive thinking may be associated with strong emotions such as excitement and enthusiasm. Such positive feelings, in turn, have been linked with an enhanced level of confidence in the decision maker’s own judgment
  Tiedens and Linton 2001

• Can lead to: confirmation bias

Questions to ponder...

• A specific number of practice hours are the standard requirement before undertaking OMPT Fellowship training, meaning:
  • Better to gain intuitive knowledge before encouraging a analytical monitoring of intuitive processing?

References