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A Tool for Clinical Reasoning and Reflection Using the *International Classification of Functioning, Disability and Health* (ICF) Framework and Patient Management Model

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Background and Purpose. Professional development is a cornerstone of physical therapist practice. As the profession moves toward the ideals of Vision 2020, more emphasis is being placed on the process of clinical decision making. Although reflection and mentorship are widely regarded as important instruments to facilitate the progression of clinical reasoning skills, little guidance exists in the postprofessional arena to assist clinicians with these essential needs. As more organizations develop formal mentoring programs, a need arises for a tool that will engage mentors, protégés, and clinicians of all abilities in thoughtful reflection and discussion that will help develop clinical reasoning skills.

Case Description. The process of developing reflective clinical decision-making skills in physical therapist practitioners is described, and how this process was used at one institution is illustrated. A tool for clinical reasoning and reflection is proposed that incorporates the existing conceptual frameworks of the *Guide to Physical Therapist Practice* and the *International Classification of Functioning, Disability and Health* (ICF).

Outcomes. This case report discusses how the tool was implemented by staff with varying levels of expertise, their outcomes in regard to the development of their clinical reasoning skills, and how the tool facilitated mentoring sessions around patient cases to improve care.

Discussion. This case report describes a practical application of a postprofessional educational process designed to develop reflective and patient-centered clinical reasoning skills. Although this process has shown some preliminary success, more research is warranted. By cultivating reflective thinking and critical inquiry, the physical therapy profession can help develop autonomous practitioners of physical therapy and promote the ideals of Vision 2020.



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Vision 2020, as set forth by the American Physical Therapy Association (APTA), highlights the following elements: autonomous physical therapist practice, direct access, the doctor of physical therapy degree and lifelong education, evidence-based practice, practitioner of choice, and professionalism.¹ As the physical therapy profession strives to reach these goals, more emphasis is being placed on the process of clinical decision making (CDM) and professional development, while using evidence and reflection to guide clinical decisions.

Common types of clinical decisions include:

- Who needs treatment and why?
- What are the expected outcomes of intervention?
- How should outcomes be measured and documented?
- What intervention, instructions, services, and number of visits are necessary to meet these outcomes?
- How should the patient and caregivers be included in the decision-making process?
- How should the success of the intervention and cost-effectiveness be evaluated?
- Are referrals needed for other health care services and screenings?

Clinical decision making is a very complex, uncertain, evaluative, scientific process² that can be costly, with a lot of intuition, in an effort to provide best practice. Physical therapists strive to make decisions that include all aspects of expert practice, including knowledge, core values, clear clinical reasoning, and excellent clinical practice skills focused on providing high-quality, patient-centered care.

In making clinical decisions, physical therapists rely on a conceptual framework that includes theories of

practice, CDM models, clinical reasoning approaches, and a model of disablement and functioning. The physical therapy profession has used a variety of conceptual frameworks, most recently the APTA's *Guide to Physical Therapist Practice*³ and the *International Classification of Functioning, Disability and Health* (ICF) as set forth by the World Health Organization.⁴

Clinical reflection and mentorship are routinely recognized as important components of professional development^{5,6}; however, little structure exists to guide clinicians through this complex process. While in the development stage of launching a pediatric residency program, we recognized the need for a clinical reasoning and reflection tool that could serve not only as a reflection guide for the resident but also to facilitate mentoring sessions. While pilot testing the tool with the resident, it became apparent that it also could benefit clinicians of all abilities in their journey from novice to expert practitioners, as great emphasis is placed on using reflection and existing clinical models to make better decisions about patient care.

The purpose of this case report is to describe the process of developing reflective CDM skills for physical therapist practice within the context of the *Guide to Physical Therapist Practice* and the ICF framework. This report illustrates case examples in which this process was used in our institution. Finally, this article proposes the use of a tool that can be used in any setting to facilitate the following goals:

1. Assist in the development of CDM skills of physical therapist practitioners.
2. Facilitate a reflective process in CDM that includes critical inquiry and the use of evidence.

3. Develop a guide or process for clinical mentoring of clinicians at all levels.
4. Integrate the ICF framework into the CDM process using the *Guide to Physical Therapist Practice* as a structural base.

Target Setting

This tool was developed for use in a large academic hospital network providing physical therapy throughout the continuum of care including acute care, inpatient rehabilitation, general outpatient rehabilitation, and sports medicine. Our staff comprises more than 65 full-time and part-time therapists with a range of experience, from new professionals to those in later career practice with more than 30 years of experience. We currently employ more than 30 board-certified specialists recognized by the American Board of Physical Therapy Specialties (ABPTS) in cardiopulmonary, pediatrics, neurology, orthopedics, and sports medicine specialties and have recently developed a pediatric residency program. As part of our department's vision for professional development, this clinical reflection tool was initiated to help novice and master clinicians alike in their personal quest for professional development and to facilitate a formalized mentorship program.

Development of the Process

In preparing for the development of our residency and mentoring pro-



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gram, a literature search was performed and important concepts were realized regarding the topics of clinical reasoning, models of CDM in physical therapy, reflection, mentorship, and expert physical therapist practice. A common element that continually arose was that although structure or a concrete approach is regarded as very important in both the clinical reflection and mentoring process, little exists in the professional community in the way of a guiding tool or worksheet to facilitate this process.

Clinical Reasoning and Models of Decision Making

Clinical reasoning has been defined as “an inferential process used by practitioners to collect and evaluate data and to make judgments about the diagnosis and management of patient problems.”^{7(p101)} Clinical reasoning includes the application of cognitive and psychomotor skills based on theory and evidence, as well as the reflective thought process, to direct individual changes and modifications called for in specific patient situations.⁸ Current research in clinical reasoning suggests that the process of applying knowledge and skill, integrated with the intuitive ability to vary an examination or treatment based on reflection and interaction to achieve a successful outcome for an individual patient, is what separates experts from novices as it relates to the clinician’s approach to reasoning.^{8–10} Jensen and colleagues⁹ described in detail the attributes of both novice and master clinicians and proposed 4 dimensions to characterize expert physical therapist practice: (1) multidimensional and patient-centered knowledge; (2) collaborative and reflective clinical reasoning; (3) observational and manual skill in movement, with a focus on function; and (4) consistent virtues. The authors illustrated the connection between these realms and high-

lighted the interplay between knowledge and reasoning.⁹

In 2003, APTA put forth the *Guide to Physical Therapist Practice* (2nd edition), which offers the patient management model as a conceptual framework for clinical decision making and includes all elements of physical therapist practice, including examination, evaluation, intervention, and outcomes.³ This model provides an overall concept map for practice in any setting and with any patient population. The *Guide to Physical Therapist Practice* also uses the Nagi model of disablement,³ which centers on the concepts of pathology, impairment, functional limitation, and disability, as a foundation. By using the Nagi model with the patient management model, clinicians are able to prioritize problems in a patient-centered method and to better understand what problems are most important to the patient.

More recently, the profession has adopted the ICF as a framework to approach patient care that shifts the conceptual emphasis away from negative connotations such as disability and places focus on the positive abilities of the individual at the patient level rather than the systems level.^{4,11} The ICF framework is a classification of the health components of functioning and disability and focuses on 3 perspectives: body, individual, and societal.⁴ These 3 perspectives underscore the importance of the interplay and influence of both internal and external factors to each individual’s condition of health.⁴

Since the introduction of the ICF as a conceptual framework, physical therapists in the United States have been slow to fully adopt it as an approach to patient care.¹² To facilitate using the ICF in practice, several practitioners have proposed

conceptual models and case examples that utilize the ICF as a basis for decision making.^{13–17} Recently, Escorpizo and colleagues¹² suggested a method to integrate the ICF into clinical practice documentation. As the profession and the *Guide to Physical Therapist Practice* evolve and seek new ways to integrate the ICF, it becomes important for the clinician to have a practical tool that uses both the ICF and the *Guide to Physical Therapist Practice* in an integrative manner to probe reflection and reasoning in order to promote best patient outcomes.

Clinical Reasoning Strategies Used in the Patient Management Model

Knowledge garnered from research in the field of clinical reasoning and decision making can be directly applied to the patient management model in a way that integrates the ICF. Clinical reasoning strategies may differ in the various domains of the model, depending upon the specific situation and the knowledge and expertise of the clinician. Clinicians also may use dialectical reasoning, an ability to use a variety of reasoning strategies for a single situation.¹⁸

Examination

Forward reasoning, or pattern recognition, often is used when identifying salient qualitative information.¹⁹ In the medical field, much attention has been afforded to the speed and accuracy with which expert practitioners can recognize patterns and formulate hypotheses.^{18,20} Clinicians also may use backward reasoning, or hypothesis-guided inquiry, which assists the practitioner in systematically negating or supporting generated hypotheses.¹⁹ This concept is central to the science and skill of differential diagnosis. McGinnis et al²¹ suggested that a nonlinear

thought process is involved in selecting specific tests and measures for balance assessment. They described 3 stages of clinical reasoning: (1) initial impressions and movement observation, (2) data gathering, and (3) diagnosis and treatment planning. Interestingly, the therapists involved in their study frequently looked ahead to their possible diagnoses and treatment plans when selecting tests and measures during the examination, all while considering patients' values and beliefs and being guided by ethical and legal aspects of professional practice.²¹

Evaluation

The clinician next synthesizes qualitative and quantitative information, considers all of the factors described by the ICF framework, and generates a diagnosis, prognosis, and plan of care. Prioritizing patient problems and linking them to the ICF framework are essential in determining if and how physical therapy may benefit the patient. Developing a flowchart or concept map may help to organize information in a meaningful way.¹⁹ Conceptual mapping also can help illuminate which problems are most important to the patient, which problems are the largest barrier to the next level of function, and which problems may be most affected by physical therapy intervention.

Intervention

Selection and progression of specific procedural interventions are part of a systematic clinical reasoning process.¹⁹ Physical therapists must utilize competent clinical decision-making skills when appraising the available evidence in the effort to select the most appropriate treatment. Although scientific evidence is emphasized in guiding decisions, clinicians also must make decisions when receiving guidance from colleagues or mentors or relying on past experience. Possessing the clinical

reasoning skills to effectively appraise and integrate evidence into practice is essentially linked to Vision 2020.

Outcomes

A key component of the clinical reasoning process in generating successful outcomes is collaboration with the patient.^{9,22} Resnik and Hart²³ ascertained that physical therapy expertise is not based on years of experience and is rather more closely linked with health-related quality-of-life outcomes and patient satisfaction. Emphasizing patient empowerment through active participation, education, and collaborative reasoning is the hallmark of expert physical therapist practice.²² Specialty-certified physical therapists also are more likely to use standardized outcome measures to make decisions about practice.²⁴ Jette and colleagues²⁴ found that although many physical therapists routinely recognize the importance of measuring outcomes, standardized outcome measures are significantly underused. They suggested that focused education, for both students and practicing professionals, may be necessary to enculturate the standard use of outcome measures in practice.²⁴

Physical therapists utilize a variety of CDM strategies that incorporate a classification system such as the ICF throughout the various elements of physical therapist practice. Knowledge and psychomotor ability, including observational analysis, are important in the development of higher-level skill demonstrative of expert practice. Prospective or forward reasoning, deductive or backward reasoning, concept mapping, evidence appraisal, and interactive collaboration with the patient and family are important strategies for CDM, and greater proficiency in these skills frequently leads to an elevated level of practice and

improved quality of care. Furthermore, it may not be necessarily years of experience that lead to clinician becoming an expert, but rather it is the development of advanced CDM that leads to the expertise associated with improved patient outcomes and quality of life.²³

Reflection

Clinical reflection is a powerful tool in developing clinical reasoning skills and professional growth.^{5,6,18,19} Reflection is a necessary skill in learning and metacognition.²⁵ *Metacognition* is defined as an "awareness or analysis of one's own learning or thinking processes."²⁶ This "thinking about thinking" has been linked to the cultivation of clinical reasoning strategies.^{5,25} Schön described reflection as occurring either "in action," during the event, or "on action" after the event.²⁷ Both processes require metacognitive thinking and can be enhanced by special instructive techniques. A unique strategy to augment reflection in action is the "think-aloud" approach for either the learner or the mentor in a given situation.^{25,28} Having a novice clinician think aloud during a clinical encounter can help the mentor identify areas where reasoning strategies may be improved.²⁵ In addition, the articulation of clinical reasoning can facilitate the metacognitive process.²⁵ The mentor also may choose to think aloud during a clinical encounter to give novice clinicians insight into his or her reasoning strategies.²⁸

After the clinical encounter, strategies to enhance learning and reasoning include both internal focused reflection and external reflective articulation, either orally or in writing.²⁹ External guided writing that is reflective on action may take the form of portfolios or journal entries.^{5,29} A critical aspect of these instructive techniques designed to promote reflection and improved

clinical reasoning is the use of structure.⁵ Although structured reflective learning experiences are common in physical therapy clinical education for students, little is known about their use in the common workplace for practicing clinicians. Wainwright and colleagues⁶ studied differences in how novice and experienced clinicians use reflection in the CDM process. They observed that although novice clinicians are more likely to reflect on the specific situation in front of them, experienced clinicians often reflect on a broader, deeper scale, bringing in past experience and thinking about the wider scope of physical therapist practice.⁶ The authors suggested that this information can be helpful in designing mentorship experiences that facilitate professional development.⁶

Mentorship

Mentorship is a cornerstone of professional development. In the practice of health care, many disciplines have written about the importance of the mentoring relationship in professional growth and development.^{30,31} Likewise, from a physical therapy perspective, mentorship is a key element in the advancement of CDM skills, the promotion of both reflection in and on action, and professional development. The multidimensional relationship between mentor and protégé has been revered as a crucial component of fostering professional growth.³² Much has been published about the key attributes of both mentors and protégés and expected outcomes of the relationship.^{30–32} A key element of a successful mentoring relationship and program is structure.¹⁹

The development of physical therapy residency and fellowship programs have allowed for structured mentorship experiences.^{19,33} In residency or fellowship programs, practicing clinicians receive a planned learning experience designed to sig-

nificantly advance their preparation to provide patient care in a defined area of practice.³⁴ Planned postprofessional clinical education programs such as these may more quickly develop an advanced practitioner and can potentially accelerate the process of developing from a novice to a master clinician.^{33,35} Structured reflection and mentorship are fundamental to the success of these programs and ultimately support the Vision 2020 goal of physical therapist as practitioner of choice.

Although residency and fellowship programs seek to advance professional and clinical reasoning skills to the realm of expertise, access and availability are relatively limited. As a result, clinicians may seek structured mentorship programs outside of residencies and fellowships, with the goal of entering into either a mentor or protégé role to promote professional development. From a nursing perspective, Block and colleagues³⁶ discussed that formal mentoring programs are important not only for personal growth and development but also for staff retention and overall organizational success. They advocated that organizations embrace the importance of formal mentorship programs and encouraged allocation of the necessary financial and human resources to ensure their success.³⁶

Clinical reflection, supported by mentorship, is a key element in developing CDM skills. Reflection and mentorship may take place either during or after a clinical encounter and may include internal reasoning processes or external articulation. Reflection and mentorship that are structured and planned lend themselves to a more comprehensive and thoughtful learning experience. Clinicians may use multiple reasoning strategies at one time, or use different strategies for a given situation. Despite this knowledge, little exists in the way of a

clinical reflection guide to probe reasoning throughout the various stages of physical therapist practice. Furthermore, although training workshops are available to educate clinicians in the art of mentorship, little specific direction is available to help mentors generate questions for protégés regarding patient case examples.

Physical Therapy Clinical Reasoning and Reflection Tool

The Physical Therapy Clinical Reasoning and Reflection Tool (PT-CRT) (Appendix) was developed and is proposed for use as a clinical reflection tool and a guide for mentors, protégés, and clinical discussion. The PT-CRT seeks to integrate the ICF framework into the patient management model while incorporating the hypothesis-driven basis of CDM models.^{13–15,37} Its design aims to probe reflection and discussion for both the novice and master clinician and may be used as a mentoring tool for specific patient cases. Clinicians may choose pertinent sections and questions to guide critical thinking or may select to complete the worksheet in its entirety. The shaded boxes include suggestions to further promote reflection or discussion with a mentor. They also may help to identify further potential inquiries to explore, either by a review of the evidence or by designing a new and important clinical question.

Application of the Process

The PT-CRT was pilot tested in the Pediatric Residency Program of the Children's Hospital of Philadelphia. The resident reported that the tool helped to organize individual patient problems. By going through the reflection questions with her mentor, she felt she was making better clinical decisions and developing a deeper understanding of the role of physical therapy for her patients. Figure 1 illustrates how the resident uti-

IV. Evaluation

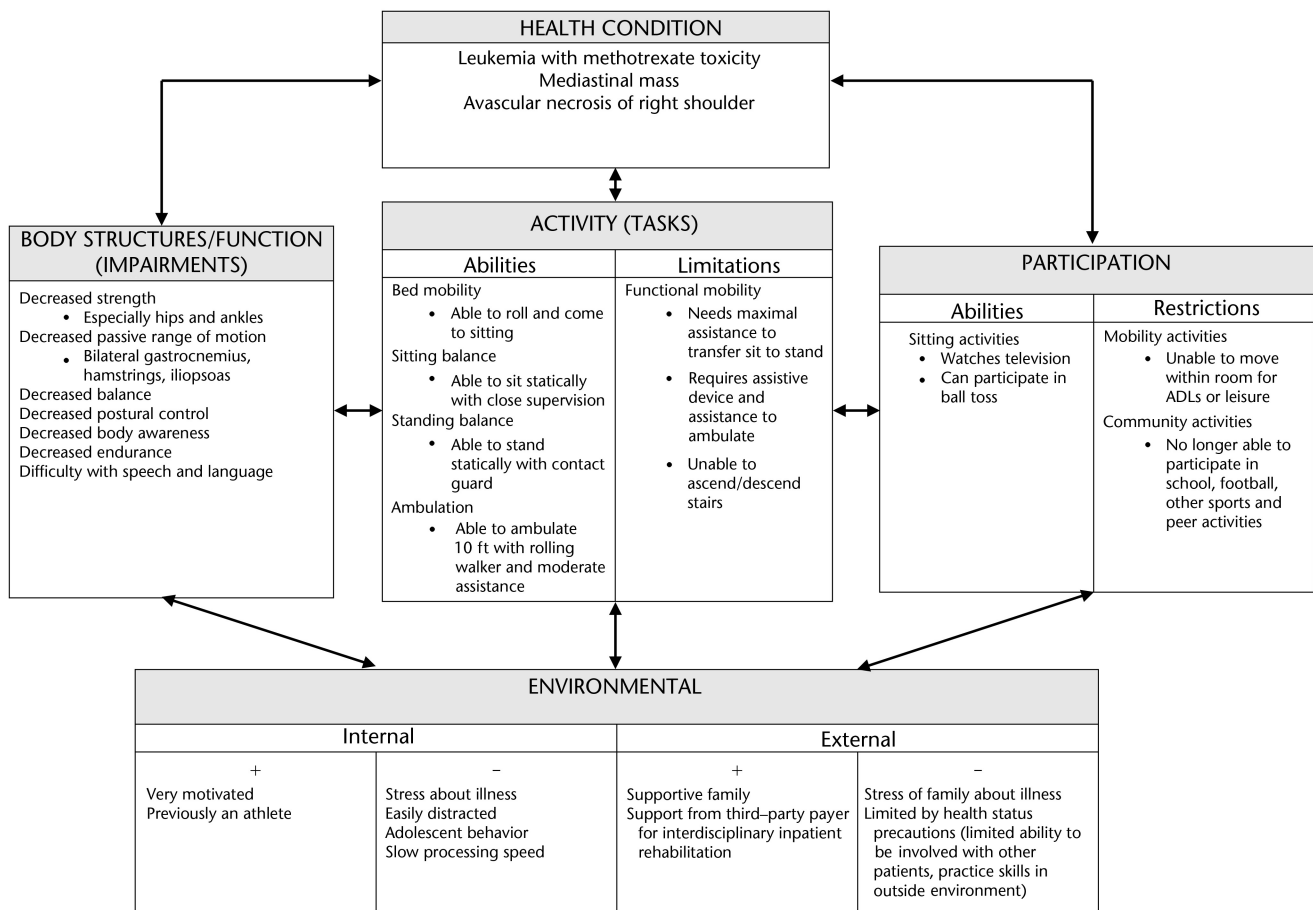


Figure 1.

Illustration of how the evaluation section of the Physical Therapy Clinical Reasoning and Reflection Tool (PT-CRT) was utilized for a 17-year-old boy with leukemia and methotrexate toxicity. ADLs=activities of daily living.

lized the evaluation section of the PT-CRT for a 17-year-old boy with leukemia and methotrexate toxicity. By using the structure provided by the tool and identifying patient problems within the context of the ICF, the resident was able to reflect on the factors that were most important to the patient, formulate a plan of care, and identify other resources (ie, psychology, social work) to help manage some of the factors outside of the typical scope of physical therapy. The resident also was able to identify environmental factors that could be a facilitator or barrier to the patient's overall progress. By doing this, she accentuated the facilitators (high motivation) and the barriers

(delayed cognitive processing) to help the patient achieve his goals as quickly as possible. When designing the intervention plan (Fig. 2), the resident initially was overwhelmed by the multitude of procedural interventions she wanted to implement with this complex patient. However, by using the reflective questions in the intervention section of the PT-CRT and having a dialogue with her mentor, the resident was able to focus on and prioritize an evidence-based intervention approach rooted in motor learning strategies such as task-specific training. The resident used the primary problem areas identified using the ICF and interaction with the patient to individualize the

treatment plan and advance the patient toward his goals. Finally, the emphasis on outcomes and measurement guided the resident in selecting appropriate outcome measures that evaluated progress across all domains of the ICF, allowing her to evaluate the value of the interventions from a holistic and patient-centered perspective.

After pilot testing the PT-CRT in our residency program, the instrument was further trial tested with staff members as part of the department's professional development program. Mentors received training through a workshop led by experienced clinicians and other mentors who dis-

Clinical Reasoning and Reflection

VI. Interventions

- a. Describe how you are using evidence to guide your practice
 - Researched methotrexate toxicity to determine what to expect in terms of neurologic recovery
 - Performed literature search for physical therapy interventions with leukemia
 - Used articles and textbooks to guide motor learning strategy
- b. Identify overall approach/strategy
 - Will use motor learning theory; emphasize task-specific practice. Will consider:
 - Feedback (intrinsic vs extrinsic, immediate vs delayed, knowledge of results vs knowledge of performance)
 - Practice (whole vs part, random vs blocked, massed vs distributed, constant vs variable)
 - Environment
 - Recovery vs compensation
 - Due to good potential for neurologic recovery from methotrexate toxicity, will emphasize recovery in interventions rather than compensatory techniques
- c. Describe and prioritize specific procedural interventions
 - Task-specific practice
 - Transfer training, bed mobility, ambulation
 - Massed practice
 - Increase number of steps by using body-weight support for locomotor training
 - Strength training
 - Progressive resistive exercises and proprioceptive neuromuscular facilitation techniques
 - Use of neuromuscular electric stimulation on hip abductors/extensors in standing as an adjunct
 - Aquatic therapy
 - Use of water properties (buoyancy, resistance) to support and challenge return of neuromuscular motor control
- d. Describe your plan for progression
 - Will utilize concept of the “challenge point”; will continually reassess and progress activities so that as the patient achieves success, he will be challenged further
 - Will periodically reassess patient status with outcome measures across various levels of the ICF to help determine which areas to prioritize during sessions:
 - Body structures/function: Balance scale, Functional Reach Test, isometric strength testing
 - Activities: Functional Improvement Measure, Dynamic Gait Index, Timed “Up & Go” Test
 - Participation: Six-Minute Walk Test, quality-of-life self-assessment
 - Will consider patient and caregiver goals, response to intervention, and positive and negative internal and external environmental factors (what is most motivating, what is most important)
 - Will perform brief systems review at beginning of each session to consider how various medical factors (blood counts, pain, fatigue, avascular necrosis) may affect or be affected by physical therapy intervention

Figure 2.

Illustration of how the intervention section of the Physical Therapy Clinical Reasoning and Reflection Tool (PT-CRT) was utilized for a 17-year-old boy with leukemia and methotrexate toxicity. ICF=International Classification of Functioning, Disability and Health.

cussed general concepts of mentorship, created role play opportunities, and introduced the PT-CRT as a mechanism to guide mentoring sessions. Both mentors and protégés welcomed the concept of a worksheet to facilitate clinical reasoning and have reported success in using the PT-CRT for mentoring discussions as well as their own clinical reflection.

Outcome

Although the PT-CRT is still in the early stages of implementation, there are some promising outcomes to report. The PT-CRT catalyzed our first department resident to present a case study at the 2010 APTA Combined Sections Meeting and to publish a Clinical Bottom Line.^{38,39} Our second resident expressed a significant shift in CDM and credited both

her mentor and the tool; this advancement in skills was confirmed by the residency committee during her last practical live patient examination. She submitted a case study at the 2011 APTA Combined Sections Meeting using the examples described in Figures 1 and 2.

The PT-CRT has received positive feedback from the rest of staff,

including mentors, protégés, and department leadership. No negative consequences or potential threats have been identified. Different aspects of the tool seem to be important based on therapist experience and comfort with the patient case. For example, the hypothesis components of sections I and II helped to advance reflection in a novice clinician by prompting anticipation of the patient's problems, and then probed further analysis of the accuracy of her predictions. Another clinician reported difficulty in generating a prognosis; he stated that examining the prognosis questions of the tool with his mentor improved his formulation of positive and negative prognostic indicators and helped him better understand the relationship between the medical prognosis and physical therapist's prognosis. Finally, experienced staff members have found the tool to be helpful in recognizing their biases in certain patient cases. They also have reported that the PT-CRT can be extremely helpful when guiding a mentoring session.

Discussion

The PT-CRT seeks to combine available resources in the profession into a user-friendly and thought-provoking worksheet that fully integrates the ICF into the CDM process. Physical therapists may use this tool not only as a conduit to make decisions about patient care but also as a vehicle for professional development through guided reflection and to stimulate discussions with a mentor or among colleagues. Clinicians also may use the PT-CRT to identify important clinical questions that warrant study and that, ultimately, may add to the literature. By actively reflecting and making thoughtful, deliberate clinical decisions, physical therapists can further their professional development, help promote the elements of Vision 2020, and,

ultimately, improve outcomes for the patients and clients they serve.

Although the initial data in this case report are promising, more research is warranted. Collaboration among residency and fellowship training sites to implement the PT-CRT and document outcomes through qualitative methods could provide further information about the helpfulness of the tool and the clinical reasoning process being developed in these programs. Additionally, more research is needed to evaluate the PT-CRT's effectiveness in different settings and how it may influence the CDM process for physical therapists with different levels of expertise. Understanding how the PT-CRT relates to the advancement of CDM skills in the journey from novice to expert clinician could provide further insight into the development of the autonomous, reflective practitioner.

Dr Atkinson and Dr Nixon-Cave provided concept/idea/project design and writing.

Part of the manuscript, including the PT-CRT Tool, was presented by both authors at an educational session at the Combined Sections Meeting of the American Physical Therapy Association; February 11, 2011; New Orleans, Louisiana.

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References

- 1 APTA Vision Sentence and Vision Statement for Physical Therapy 2020. Available at: <http://www.apta.org/vision2020>. Accessed July 22, 2010.
- 2 Watts NT. Clinical decision analysis. *Phys Ther*. 1989;69:569-576.
- 3 Guide to Physical Therapist Practice. 2nd ed. *Phys Ther*. 2001;81:9-746.
- 4 *International Classification of Functioning, Disability and Health*. Available at: <http://www.who.int/classifications/icf/en>. Accessed July 22, 2010.

- 5 Shepard KF, Jensen GM. Techniques for teaching and evaluating students in academic settings. In: Shepard KF, Jensen GM, eds. *Handbook of Teaching for Physical Therapists*. 2nd ed. Boston, MA: Butterworth-Heinemann; 2002:71-132.
- 6 Wainwright SF, Shepard KF, Harman LB, Stephens J. Novice and experienced physical therapist clinicians: a comparison of how reflection is used to inform the clinical decision-making process. *Phys Ther*. 2010;90:75-88.
- 7 Lee JE, Ryan-Wenger N. The "Think Aloud" seminar for teaching clinical reasoning: a case study of a child with pharyngitis. *J Pediatr Health Care*. 1997;11:101-110.
- 8 Palisano RJ, Campbell SK, Harris SR. Evidence-based decision making in pediatric physical therapy. In: *Physical Therapy for Children*. 3rd ed. St Louis, MO: Saunders-Elsevier; 2006:3-32.
- 9 Jensen GM, Gwyer J, Shepard K. Expert practice in physical therapy. *Phys Ther*. 2000;80:28-43.
- 10 Jensen GM, Shepard KF, Gwyer J, Hack LM. Attribute dimensions that distinguish master and novice physical therapy clinicians in orthopedic settings. *Phys Ther*. 1992;72:711-722.
- 11 Jette AM. Toward a common language for function, disability, and health. *Phys Ther*. 2006;86:726-734.
- 12 Escorpizo R, Stucki G, Cieza A, et al. Creating an interface between the *International Classification of Functioning, Disability and Health* and physical therapist practice. *Phys Ther*. 2010;90:1053-1063.
- 13 Steiner WA, Ryser L, Huber E, et al. Use of the ICF model as a clinical problem-solving tool in physical therapy and rehabilitation medicine. *Phys Ther*. 2002;82:1098-1107.
- 14 Palisano RJ. A collaborative model of service delivery for children with movement disorders: a framework for evidence-based decision making. *Phys Ther*. 2006;86:1295-1305.
- 15 Schenkman M, Deutsch JE, Gill-Body KM. An integrated framework for decision making in neurologic physical therapist practice. *Phys Ther*. 2006;86:1681-1702.
- 16 Helgeson K, Smith AR Jr. Process for applying the *International Classification of Functioning, Disability and Health* model to a patient with patellar dislocation. *Phys Ther*. 2008;88:956-964.
- 17 Rundell SD, Davenport TE, Wagner T. Physical therapist management of acute and chronic low back pain using the World Health Organization's *International Classification of Functioning, Disability and Health* [erratum in: *Phys Ther*. 2009;89:310]. *Phys Ther*. 2009;89:82-90.
- 18 Edwards I, Jones M, Carr J, et al. Clinical reasoning strategies in physical therapy. *Phys Ther*. 2004;84:312-330.
- 19 Tichenor CJ, Davidson JM. Postprofessional clinical residency education. In: Shepard KF, Jensen GM, eds. *Handbook of Teaching for Physical Therapists*. 2nd ed. Boston, MA: Butterworth-Heinemann; 2002:473-502.

- 20 Eva KW. What every teacher needs to know about clinical reasoning [erratum in: *Med Educ*. 2005;39:753]. *Med Educ*. 2005; 39:98-106.
- 21 McGinnis PQ, Hack LM, Nixon-Cave K, Michlovitz SL. Factors that influence clinical decision making of physical therapists in choosing a balance assessment approach. *Phys Ther*. 2009;89:233-247.
- 22 Resnik L, Jensen GM. Using clinical outcomes to explore the theory of expert practice in physical therapy. *Phys Ther*. 2003;83:1090-1106.
- 23 Resnik L, Hart DL. Using clinical outcomes to identify expert physical therapists. *Phys Ther*. 2003;83:990-1002.
- 24 Jette DU, Halbert J, Iverson C, et al. Use of standardized outcome measures in physical therapist practice: perceptions and applications. *Phys Ther*. 2009;89: 125-135.
- 25 Banning M. The think aloud approach as an educational tool to develop and assess clinical reasoning in undergraduate students. *Nurse Educ Today*. 2008;28:8-14.
- 26 Merriam-Webster Online Dictionary. Metacognition definition. Available at: <http://www.merriam-webster.com/dictionary/metacognition>. Accessed July 22, 2010.
- 27 Schön DA. *The Reflective Practitioner*. New York, NY: Basic Books; 1983.
- 28 Borleffs JC, Custers EJ, van Gijn J, ten Cate OT. "Clinical reasoning theater": a new approach to clinical reasoning education. *Acad Med*. 2003;78:322-325.
- 29 Murphy JL. Using focused reflection and articulation to promote clinical reasoning: an evidence-based teaching strategy. *Nurs Educ Perspect*. 2004;25:226-231.
- 30 Ali PA, Panther W. Professional development and the role of mentorship. *Nurs Stand*. 2008;22:35-39.
- 31 Schrubbe KF. Mentorship: a critical component for professional growth and academic success. *J Dent Educ*. 2004;68: 324-328.
- 32 Gandy JS. Mentoring. *Orthopaedic Practice*. 1993;5:6-9.
- 33 Godges JJ. Mentorship in physical therapy practice. *J Orthop Sports Phys Ther*. 2004; 34:1-3.
- 34 American Physical Therapy Association. Residencies and fellowships. Available at: <http://www.apta.org/AM/Template.cfm?Section=Residency&CONTENTID=30116&TEMPLATE=/CM/ContentDisplay.cfm>. Accessed July 22, 2010.
- 35 Hartley G. Postgraduate residency training for physical therapists: its role in contemporary practice. *HPA Resource*. 2006;6: 1-4.
- 36 Block LM, Claffey C, Korow MK, McCaffrey R. The value of mentorship within nursing organizations. *Nurs Forum*. 2005; 40:134-140.
- 37 Rothstein JM, Echternach JL, Riddle DL. The Hypothesis-oriented algorithm for clinicians II (HOAC II): a guide for patient management. *Phys Ther*. 2003;83:455-470.
- 38 Hanson H, Atkinson H. Rehabilitation of a 13-year old female with an incomplete spinal cord injury due to Pott's disease: abstracts of poster presentations at the 2010 Combined Sections Meeting. *Pediatr Phys Ther*. 2010;22:103-146.
- 39 Hanson HL. Critically appraised topic: effect of thoracic lumbar sacral orthoses on function for adolescents with incomplete spinal cord injuries. *Pediatr Phys Ther*. 2010;22:242-244.

Appendix.The Physical Therapy Clinical Reasoning and Reflection Tool (PT-CRT)^a**I. Initial Data Gathering/Interview**

- a. History and present function

REFLECTION POINTS:

- Assess how the patient's medical diagnosis affects your interview.
- How might your personal biases/assumptions affect your interview?
- Assessing the information you gathered, what do you see as a pattern or connection between the symptoms?
- What is the value of the data you gathered?
- What are some of the judgments you can draw from the data? Are there alternative solutions?
- What is your assessment of the patient's/caregiver's knowledge and understanding of their diagnosis and need for PT?
- Have you verified the patient's goals and what resources are available?
- Based on the information gathered, are you able to assess a need for a referral to another health care professional?

II. Generation of Initial Hypothesis

- a. Body structures/functions
- b. Impairments
- c. Activity limitations
- d. Participation restrictions

REFLECTION POINTS:

- Can you construct a hypothesis based on the information gathered?
- What is that based on (biases, experiences)?
- How did you arrive at the hypothesis? How can you explain your rationale?
- What about this patient and the information you have gathered might support your hypothesis?
- What do you anticipate could be an outcome for this patient (prognosis)?
- Based on your hypothesis, how might your strategy for the examination be influenced?
- What is your approach/planned sequence/strategy for the examination?
- How might the environmental factors affect your examination?
- How might other diagnostic information affect your examination?

(Continued)

Appendix.
Continued

III. Examination

a. Tests and Measures

RELECTION POINTS:

- Appraising the tests and measures you selected for your examination, how and why did you select them?
- Reflecting on these tests, how might they support/negate your hypothesis?
- Can the identified tests and measures help you determine a change in status? Are they able to detect a minimum clinically important difference?
- How did you organize the examination? What might you do differently?
- Describe considerations for the psychometric properties of tests and measures used.
- Discuss other systems not tested that may be affecting the patient's problem.
- Compare your examination findings for this patient with another patient with a similar medical diagnosis.
- How does your selection of tests and measures relate to the patient's goals?

(Continued)

Appendix.
Continued

IV. Evaluation

HEALTH CONDITION

BODY STRUCTURES/FUNCTION (IMPAIRMENTS)

ACTIVITY (TASKS)	
Abilities	Limitations

PARTICIPATION	
Abilities	Restrictions

ENVIRONMENTAL			
Internal		External	
+	–	+	–

(Continued)

Appendix. Continued

IV. Evaluation (continued)

- a. Diagnosis
- b. Prognosis

REFLECTION POINTS:

- How did you determine your diagnosis? What about this patient suggested your diagnosis?
- How did your examination findings support or negate your initial hypothesis?
- What is your appraisal of the most important issues to work on?
- How do these relate to the patient's goals and identified issues?
- What factors might support or interfere with the patient's prognosis?
- How might other factors such as bodily functions and environmental and societal factors affect the patient?
- What is your rationale for the prognosis, and what are the positive and negative prognostic indicators?
- How will you go about developing a therapeutic relationship?
- How might any cultural factors influence your care of the patient?
- What are your considerations for behavior, motivation, and readiness?
- How can you determine capacity for progress toward goals?

V. Plan of Care

- a. Identify short-term and long-term goals
- b. Identify outcome measures
- c. PT prescription (frequency/intensity of service, include key elements)

REFLECTION POINTS:

- How have you incorporated the patient's and family's goals?
- How do the goals reflect your examination and evaluation (ICF framework)?
- How did you determine the PT prescription or plan of care (frequency, intensity, anticipated length of service)?
- How do key elements of the PT plan of care relate back to primary diagnosis?
- How do the patient's personal and environmental factors affect the PT plan of care?

(Continued)

Appendix.
Continued**VI. Interventions**

- a. Describe how you are using evidence to guide your practice
- b. Identify overall approach/strategy
- c. Describe and prioritize specific procedural interventions
- d. Describe your plan for progression

REFLECTION POINTS:

- Discuss your overall PT approach or strategies (eg, motor learning, strengthening).
 - How will you modify principles for this patient?
 - Are there specific aspects about this particular patient to keep in mind?
 - How does your approach relate to theory and current evidence?
- As you designed your intervention plan, how did you select specific strategies?
- What is your rationale for those intervention strategies?
- How do the interventions relate to the primary problem areas identified using the ICF?
- How might you need to modify your interventions for this particular patient and caregiver? What are your criteria for doing so?
- What are the coordination of care aspects?
- What are the communication needs with other team members?
- What are the documentation aspects?
- How will you ensure safety?
- Patient/caregiver education:
 - What are your overall strategies for teaching?
 - Describe learning styles/barriers and any possible accommodations for the patient and caregiver.
 - How can you ensure understanding and buy-in?
 - What communication strategies (verbal and nonverbal) will be most successful?

(Continued)

Appendix. Continued

VII. Reexamination

a. When and how often

REFLECTION POINTS:

- Evaluate the effectiveness of your interventions. Do you need to modify anything?
- What have you learned about the patient/caregiver that you did not know before?
- Using the ICF, how does this patient's progress toward goals compare with that of other patients with a similar diagnosis?
- Is there anything that you overlooked, misinterpreted, overvalued, or undervalued, and what might you do differently? Will this address any potential errors you have made?
- How has your interaction with the patient/caregiver changed?
- How has your therapeutic relationship changed?
- How might any new factors affect the patient outcome?
- How do the characteristics of the patient's progress affect your goals, prognosis, and anticipated outcome?
- How can you determine the patient's views (satisfaction/frustration) about his or her progress toward goals? How might that affect your plan of care?
- How has PT affected the patient's life?

VIII. Outcomes

a. Discharge plan (include follow-up, equipment, school/work/community re-entry, etc)

REFLECTION POINTS:

- Was PT effective, and what outcome measures did you use to assess the outcome? Was there a minimum clinically important difference?
- Why or why not?
- What criteria did you or will you use to determine whether the patient has met his or her goals?
- How do you determine the patient is ready to return to home/community/work/school/sports?
- What barriers (physical, personal, environmental), if any, are there to discharge?
- What are the anticipated life-span needs, and what are they based on?
- What might the role of PT be in the future?
- What are the patient's/caregiver's views of future PT needs?
- How can you and the patient/caregiver partner together for a lifetime plan for wellness?

IX. Mentor Feedback:

Strengths:

Opportunities for development:

^a PT=physical therapy, ICF=*International Classification of Functioning, Disability and Health*.

Physical Therapy

Journal of the American Physical Therapy Association and



A Tool for Clinical Reasoning and Reflection Using the *International Classification of Functioning, Disability and Health* (ICF) Framework and Patient Management Model

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