University of Alberta

How Physical Therapists Make Clinical Decisions

by

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Submitted to the Faculty of Extension

in partial fulfillment of the requirements for the degree of

Master of Arts in Communications and Technology

Edmonton, Alberta

Fall 2004

Acknowledgements

This project would not have been completed without the support of my husband,

John and my children, Michelle, Daniel and Charlotte,

my parents Margaret and Francis Dolphin

and of course my sister, Maureen, who lead the way.

I would also like to acknowledge my advisor, Dr. Marco Adria, for his patience

and consistent encouragement.

Disclaimer

This research project was conducted independently. All opinions, conclusions and recommendations expressed within are solely those of the author and are presented in the spirit of scientific discovery.

Abstract

Information technology is becoming part of the daily routine for most healthcare professionals and is seen as integral to improving patient care. Yet there remains a gap between planned implementation and organizational rhetoric on the one hand and actual use on the other. Frontline physical therapists were asked to describe how they made clinical decisions and to report the role of information technology in these decisions. Two types of clinical decisions were considered: daily, patient specific and planning decisions. For all eight therapists interviewed direct consultation with multidisciplinary team members was reported as most valuable. Using textbooks or completing an Internet search was also reported to be used commonly for daily decisions where quick, basic information was needed. Research-based information was typically accessed for planning decisions. Trips to the library were most often chosen over convenient online databases and e-libraries. Even recently trained, physical therapists with well-developed skills in using computers rarely used technology to inform their clinical decisions. Giddens' structuration and Orlikowski's structurational model of technology provide a theoretical framework for understanding how making decisions as a team and using printed texts develop as normalized structures. These structures are soundly integrated into work processes while technologies such as e-libraries remain under utilized when compared with organizational plans and rhetoric. Further study is recommended of collaborative team decision-making practices in the context of consistent organizational support for innovative uses of information technology in clinical decision-making.

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Chapter 1: Introduction

Healthcare is a rapidly changing, highly technical industry. Patient care, especially in the acute care setting, involves a series of daily clinical decisions, usually by a number of health professionals. Along with these daily clinical decisions about what treatment would be best for patient A, clinical decisions are also required when planning for the care of a new population of patients. This type of planning is necessary when a professional moves to a new area or when a group of patients with a diagnosis that is uncommonly seen or a new procedure, surgery or treatment is to be incorporated into the patient caseload. These decisions and the procedures or treatments carried out in relation to the decisions, constitute what is commonly referred to as the practice of a healthcare provider.

To make good decisions and thereby practice competently, professionals rely on their training and their current knowledge. It is expected that healthcare professionals are constantly increasing their knowledge by accessing high quality information, evaluating it in the context of their experience and then applying it when making clinical decisions. This expectation is not unique to healthcare. Many people are driven by self-motivation to be the best they can at their work. However, similar to many other professions, there are also external motivators for regulated healthcare clinicians to be on top of their game. All healthcare professionals follow discipline specific, professional standards that set expectations for all areas of practice. These standards outline what it means to be working at an acceptable competency level. Included within these are standards regarding patient evaluation and treatment but there are also standards that are

specific to engaging in continual professional development. In some jurisdictions legislation is in place that also requires health professionals to maintain their competence as part of a continuing competency program, administered by their regulatory body.

The influential evidence based practice and knowledge transfer movements in the healthcare academia promote the integration of research based information into daily healthcare work as a required modus operandi of a competent professional. In fact, Sackett (1996), who is considered one of the champions of evidence based medicine, defined it as "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients." (p. 71)

There appears to be every reason for frontline clinicians to want access to good quality information, which they can add to their own knowledge bank and in turn use to improve their clinical decision-making and overall practice. For those with even basic computer skills, information is truly at their fingertips. Trips to the library can be virtual as many credible sources of information exist on the Internet; searchable journal databases, information websites, professional chat rooms, clinical guideline clearinghouses, and so on. Communication technologies have become or are quickly becoming commonplace in healthcare organizations across Canada. Access to the Internet, telehealth conferencing and an e-library service is present in many larger hospitals and clinics. Some organizations also have access to human librarian services where the actual legwork of searching for information is done professionally.

In many larger organizations, practice specialist positions, which are in essence knowledge broker positions, are created to assist those working on the frontline with their knowledge needs. Typically these positions are created when the number of professionals of a certain discipline is large and/or the area of practice is highly technical. Budgets and business cases are also a necessity for establishing these support positions, which are one step removed from the frontline. Most areas have clinical nurse specialist positions, for example, but most other healthcare professionals, even in large organizations, do not have official knowledge brokers to resource when making clinical decisions.

It is vital that a healthcare organization supports the clinical decision-making of all professionals. Professionals in the healthcare industry can be divided into three main groups: Nursing, Physicians (Surgeons) and Allied Health professionals (dieticians, occupational therapists, pharmacists, physical therapists, psychologists, social workers, speech language pathologists, etc.). Physical Therapists (PTs) are a group of frontline professionals who play a key role in the rehabilitation of patients. In acute care, along with other allied health professionals, they provide both consultation and hands on treatment for patients throughout the different services. Their decision support structure varies from that of the larger groups of nursing and physicians because of their relatively small numbers.

The prime focus of physical therapy care is to assess and treat mobility issues. In acute care, PTs work in the various services (Orthopaedics, Neurology, Surgery, etc.) and simply put, they help to get patients moving. Injuries or illness

can lead to joint stiffness, pain, swelling, or weakness and/or can lead to a decrease in a patient's overall function. The goal of physical therapy and rehabilitation in general is to assist patients to reach their functional potential. PTs may provide a number of treatments to get affected areas moving again, whether it is following knee replacement surgery, a stroke or due to Parkinson's disease, for example.

Any given patient care unit in an acute care hospital would have a variety of professionals associated with the care of the patients. Nursing professionals (registered nurses, licensed practical nurses and advanced practice nurses) typically outnumber the other professionals. This is due mainly to the 24/7 nature of nursing. Also, every patient has nursing personnel assigned to him or her, whereas each patient does not always receive the services of the allied health professionals.

Nursing numbers drive the structure of practice resource positions. Typically in acute care, frontline nurses have the support of clinical nurse specialists and nurse educators (also called link nurses) whose role includes the introduction of new procedures, equipment and clinical information. The nurse specialists and educators are not assigned patients and focus on being knowledge brokers for the frontline nurses. As the allied health professions, including the PTs, do not have these designated specialists or educator positions, the frontline clinicians become their own knowledge brokers, in addition to caring for a caseload of patients.

It would seem reasonable to assume that in order to practice competently and within an evidence based practice model, speedy access to credible information would be desirable, especially for the allied health professionals who do not have clinical specialist positions for practice support. Communication technologies with quick links to external information and experts would seem to be of great value.

Problem and Research Question

Despite a rich scientific foundation, many in the healthcare field continue to believe that there remains a "knowing-doing gap" (Pfeffer and Sutton, 2000, p. 85) between what is known in the research literature to be best practice and what is actually practiced within many healthcare institutions. Berwick (2003) believes that the dissemination of successful healthcare innovations or practices is much too slow, which is actually causing harm to patients, not to mention increasing costs. This suggests that clinicians are not making use of what appears to be ample, accessible information sources to assist with clinical decisions and to expand their knowledge base. Others believe that accessible information is only one factor in how clinical decisions are made. To begin to understand this situation, a closer look at clinical decision-making would be beneficial.

The clinical decision-making habits of doctors and nurses have been studied previously. This research project endeavoured to investigate how a particular group of allied healthcare providers, PTs, working in a large acute care hospital make clinical decisions. Currently the PTs in the organization examined have access to an information systems network, which includes the Internet and an Intranet with an impressive e-library. The PTs also have access and card privileges to a medical library, located within the same building. Besides the borrowing of materials, staff can use the library help desk. Professional librarian consultation and literature searches are also available to the PTs via the Intranet or by calling the library help phone line. This environment appears rich in

information resources to support the clinical decision-making. What is of interest is how those resources are utilized.

With the assumptions that these PTs strive to be competent by increasing and applying new knowledge and that these PTs attempt to access information to assist their clinical decision-making, the following question was researched:

How do Physical Therapists, working in acute care, make clinical decisions?

Eight PTs working in the acute care units were interviewed about their individual processes for making both daily and planning related clinical decisions. Daily clinical decisions were considered to be those made in relation to a specific patient. Planning decisions involved those decisions made when the PT was either reviewing the current practice regimes in their area or when a new population of patients was to be seen. PTs were also asked about information sources they accessed regularly, to keep themselves current when a specific clinical decision was not pending.

Chapter 2: Literature Review

Clinical decision-making within the nursing profession has been studied extensively by Carl Thompson and his colleagues. In a major analytical report to the Britain's National Health Service, Thompson C., McCaughan, Cullum, Sheldon, Thompson, D. and Mulhall (2001) described six types of clinical decisions routinely made by frontline nurses. Thompson C., McCaughan, Cullum, Sheldon, Mulhall, & Thompson, D (2001) continued to explore clinical decision-making by studying the relationship between it and research based knowledge resources. Specifically Thompson et al. (2001) looked at frontline acute care nurses' perception of resource accessibility. Three perspectives on accessibility were identified including the humanist, local information and information accessed by technology. The humanist perspective involved accessing information from human sources, usually within the same workplace and same discipline – clinical nurse specialists for example. The local information perspective entails accessibility of a variety of information products that have been produced in-house – policies, procedures and protocols are examples. The third perspective involves using technology to access external information directly from online databases, journals, websites, and so on. Thompson et al. found that overall nurses were likely to access human resources when making real time or daily clinical decisions. These human resources were most often on-site clinical nurse specialists or link nurses. Thompson et al. recommends that if these are the preferred resource of the frontline nurses then all attempts should be made to use this information conduit for research based best

practice messages. Interestingly, Thompson et al. did not always find the link nurses to be using an evidence based approach in their own positions.

Some generalizations from the Thompson et al. (2001) work in nursing may be transferable to other healthcare providers such as PTs. The types of clinical decisions made by PTs about patient treatments or interventions are very similar. The difference would be in the actual intervention itself. However, the findings of Thompson et al. regarding information accessibility may not be directly transferable. The reason is that the working environment and the resources available for the nurses are different than those for the PTs. As discussed earlier, allied health professionals, including PTs, do not typically have designated in-house specialists to assist them.

Rappolt and Tassone (2002) studied how occupational and physical therapists working in the community healthcare sector gathered, evaluated and applied new knowledge. The workplace for PTs in a community is quite different than that of an acute care or hospital environment. On a daily basis, community PTs work more often in isolation or with a few other professionals of the same discipline. The larger interdisciplinary team approach seen in the acute care setting is not typically present in the community. Participants were asked about their clinical learning habits and how they incorporated new clinical information into their clinical practice. Consultation with peers was the first educational resource for most participants and they stated that they would prefer opportunities to work along side other professional peers, especially with educationally influential therapists, versus working alone. Use of a systematic approach to

accessing and evaluating literature was not present for most respondents. Interestingly Rappolt and Tassone remarked about the "high expectations on the part of regulatory bodies, professional organizations, payers and the public for therapists' application of research evidence." (p. 171) Therapists are expected to practice evidence based medicine by reading and appraising the research literature and then implementing changes (transfer the new knowledge) to their practice in response to new research findings. However, Rappolt and Tassone agreed with other authors (Sweetland and Craik, 2001, Dubouloz, Egan, Vallerand, and von Zweck, 1999, Curtin and Jaramazovic, 2001, Bohannon, 1999) that the in reality "competence (of occupational and physical therapists) in critical analyses and methods for knowledge translation should not be assumed". (p. 175) These authors also found that participants valued formal continuing education, in particular, participatory learning or practical, hands-on courses and workshops offered outside of work. Overall, many interviewees had difficulty describing how they integrated new knowledge into practice and many participants reported barriers to all forms of attaining new knowledge. Rappolt and Tassone recommend that there be further study of the frequently used, influential peer or perceived specialist consultation as a route for the translation of new knowledge.

A survey of 448 American PTs done by Jette et al. (2003) revealed that although the PTs had a positive attitude towards evidence based practice they generally realized that they should do more to implement an evidence based practice approach in their own practice. Many PTs reported a lack of confidence in both their literature searching skills (34%) as well as their ability to critically

appraise research (44%). The most common obstacle to practicing evidence based medicine was reported to be lack of time. PTs who had graduated within the last five years reported more proficiency in using technology to access research literature. The questions posed in the survey focused on access to and evaluation of research literature with minimal inquiry into whether the participants felt that evidence based practice helps them with clinical decisions. The survey appeared to assume that evidence based practice equates to accessing online databases and understanding research terminology. Questions about other resources or strategies utilized by PTs in clinical decision-making were not included.

A meta-analysis completed by Thomson O'Brien et al. (1998) reviewed the effectiveness of local opinion leaders on professional practice and health care outcomes. The trials in the review involved opinion leaders who were community and hospital based physicians or nurses. The conclusion presented was that opinion leaders had mixed effects on practice and outcomes. This was due to inconsistency in the description of what opinion leaders do. Further research to explore the identification of leaders and to reveal the circumstances where they may be effective in facilitating improvements in practice and outcomes was advised.

Other authors have explored the topic of clinical decisions, evidence based information and corresponding changes in practice from an organizational perspective. Stetler (2003) and Leggat (2003) both comment on how healthcare providers aspire to practice from evidence based knowledge foundations but often

do not realize actual changes in practice. Providers may have access to decision support information but are not adopting it due to their organization's existing structures, processes and/or culture. Stetler (2003) elaborates, suggesting that overall improvements in quality of care cannot be achieved by expecting individual clinicians to change their own practice. Improved clinical decision-making and the resultant outcomes must be viewed across an organization and implemented from a system-wide perspective. Ferlie and Shortell (2001) outline that high quality practice includes strong leadership, a learning culture, effective teams and efficient use of information technologies.

Berwick (2003) suggests that ultimately adoption of new evidence based innovations or practices within healthcare institutions is best accomplished by an integration of the principles from the Diffusion of Innovations theory (Rogers, 1995). Rather than just make evidence based information available, Berwick recommends institutions must find and support innovations and their early adopters. Encouraging adoption and reinvention, while making support for adoption obvious to all, is key according to Berwick.

Jadad, Haynes, Hunt and Browman (2000) suggest that the Internet can be a powerful tool for facilitating the exchange and appraisal of research information. However, more evolution is required to strengthen the links between the Internet and evidence based decision-making. Jadad et al. recommend that an Internet - evidence synergy is needed to truly harness the opportunities promised by improved information access.

Sigouin and Jadad (2002) conducted a cross-sectional survey to discover the awareness of research evidence on the Internet. The survey included both healthcare providers (nurses and physicians) and patients. These authors concluded that there were varying degrees of awareness not only between healthcare providers and patients but also between groups of clinicians. Interestingly, sources of the high quality research literature were unknown to some clinicians.

Several authors have studied the actual utilization of information technology to access healthcare information. Many in the field of information systems present evidence supporting the existence of commonalities in the adoption and integration of information technologies into any setting (Orlikowski, 1996, Townsend, DeMarie and Hendrickson, 1998, Henfridsson, 2000, Joshi and Rai, 2000, Damsgaard and Scheepers, 2000). These authors report on regularly witnessed obstacles to successful integration of information technologies such as technophobia, inappropriate training of users and poor understanding of technologies' abilities and potentials. In addition, there is strong agreement that successful implementation of new technologies should include evaluation of organizational context and of the end-user's role and level of satisfaction. There is also mounting evidence that unanticipated, emergent and/or innovative uses for technologies occur within most implementations (Orlikowski, 1996, Yates, 2002). Considerations of all of these factors are important if an institution believes strongly that use of information technology is necessary for evidence based practice.

There does appear to be agreement in the literature that generally the healthcare industry, in comparison with other sectors, has been relatively slow to fully integrate information technologies (Staggers, Gassert and Skiba, 2000, Parker and Coiera, 2000, Tuttle, 1999). Parker and Coiera (2000) discovered that healthcare workers tend to continue to favour synchronous modes of communication. In addition, Kaplan, Flatley, Bennan, Dowling, Friedman and Peel (2000) suggest that "as we have advanced in medical informatics and created many impressive innovations, we also have learned that technologic developments are not sufficient to bring the value of computer and information technologies to health care systems."(p. 240) Luxenberg et al. (1997) found that healthcare providers were less likely to integrate information technologies because the amount of time a healthcare provider must spend to learn and to use the technology usually outweighed the long list of obvious benefits, including quicker availability of information and potential for clinical decision support. Overall, Luxenberg et al. concluded "in the absence of a strong central mandate, providers must perceive a clear benefit in order to be willing to learn and use a new technology." (p. 807) Surveys of healthcare providers, however, continue to show both "high expectations for clinical information technologies" (Business Wire Healthcare, 2002) that support clinical practice and a belief that they will become common in their workplace.

Frontline healthcare provision is all about making good clinical decisions. The literature recognizes the pressure on clinicians to practice evidence based

medicine. Many types of resources are available. This project endeavoured to evaluate which of these resources are used by the frontline PTs.

Theoretical Application

The terms evidence based practice or best practice have become buzzwords which are voiced daily in all areas of healthcare. Using the literature to assist in making informed and appropriate clinical decisions is expected and considered an essential for practicing evidence based medicine. Most organizations have spent ample funds to provide clinicians with access to the ever-expanding bank of electronic information sources. However, for decades doctors and nurses, and more recently multidisciplinary teams, have met face-to-face in "rounds", to plan the care for patients together. This human interaction approach to making clinical decisions has been well established. The introduction of electronic access to vast databases of healthcare literature and information is relatively new. Can these two very different types of support structures co-exist? Are they becoming integrated with each other?

The meta-theory of Structuration (Giddens, 1984) and one of the more specific spin-off theories, the structurational model of technology (Orlikowski, 1992), can be applied to the PTs and their clinical decision-making habits. Structuration theory, a general theory of social systems, has two interrelated components, humans or actors and their patterns of interactions or structures. Giddens proposes that these are present as a mutually interacting duality not as independent components. Kouroubali (2002) explains Giddens' duality as "human agents produce, reproduce or modify social structures through their

actions and in turn social structures enable or disable human actions." (p. 2) Actions taken regularly become the structures of the organization. When humans act together in a social situation, such as working in an organization, they use and modify structures on a continual basis. Structures are dependant upon the acceptance of and the integration by the actors or workers. The greater the integration the more significant the structure. Integration of a social structure is usually a complex process. Put simply, new or modified social interactions, once introduced, are interpreted, transformed and eventually sanctioned by organizations and the actors within them. Giddens (1984) sees these as fundamental elements of social interaction, which lead to structure creation. He refers to them as meaning, power and norms. Actors develop meaning as they interpret and communicate actions within their current context. Power involves the organization's and/or the workers' capacity to transform or customize an action to fit within the organizational context. Norms are the underlying conventions or rules present within an organizational culture, which guide any change to the moral order of organizational structures. These highly interdependent elements intertwine to establish a structure.

Orlikowski's (1992) Structuration Model of Technology can be helpful in studying this situation. This model further focuses the concept of the Giddens' (1984) duality (between actors and social structures) to the duality existing between actors and technology. Orlikowski proposes "Technology is created and changed by human action, yet it is also used by humans to accomplish some action."(p. 405) In addition, Orlikowski believes that technology is not static but

"interpretively flexible."(p. 405) Technology can be transformed to some degree from its original intention, the designer's view, to something that can be normalized by the actors in an organization, producing a resultant structure. Orlikowski suggests that technology should be studied as a socially constructed product and not solely as an objective product. In considering how physical therapists make clinical decisions, what organizational structures do they consciously and subconsciously rely upon? The two theories of structuration provide a comprehensive foundation for analysis.

Chapter 3: Methodology

This qualitative research project was designed using an interpretive case study model. The research plan included conducting six to eight semi-structured interviews with Physical Therapists (PTs) who work in one of the specialized units within an acute care organization. Analysis of the data would be done in an interpretive manner, applying Grounded Theory (Glaser and Strauss, 1967). Grounded Theory is an emergent as opposed to a hypothesis testing research methodology. Hypothesis testing or hypothetico-deductive research methodology relies on prediction and often on strict control of the situation, in order to isolate variables, establish outcomes and revisit the hypothesis to confirm or not. With emergent methodology the theory develops and evolves throughout the research project as the researcher gathers, groups and makes sense of the data. The process is an active one where the researcher is continually comparing and categorizing data, searching for repetition in order to try to analyze and represent the research situation. Grounded theory begins with the data, not the hypothesis and attempts to uncover and highlight the theoretical themes or phenomena within the data. It attempts to make sense of a situation for the researcher and hopefully for the participants under study. Haig (1995) stresses the importance of collecting strong and reliable data, as its role is to provide the contextual evidence in support of a larger phenomenon.

The process followed when using Grounded Theory methodology includes six phases. Data-collection is the first phase in which data may be accumulated in various ways – interviews, observation, feedback analysis, for example. Note-

taking, the second phase begins within data-collection and for this project involved audio taping of the interviews. The notes are then coded, the third phase, a sentence or phrase at a time. The objective of coding is to pull out the themes that can be identified, named and categorized. Categories can be abstract or concrete and they are established as they emerge. Different types of categories may become apparent. A category that connects well with others and appears with a high frequency can be considered a core category. Establishing core categories increases the efficiency of coding.

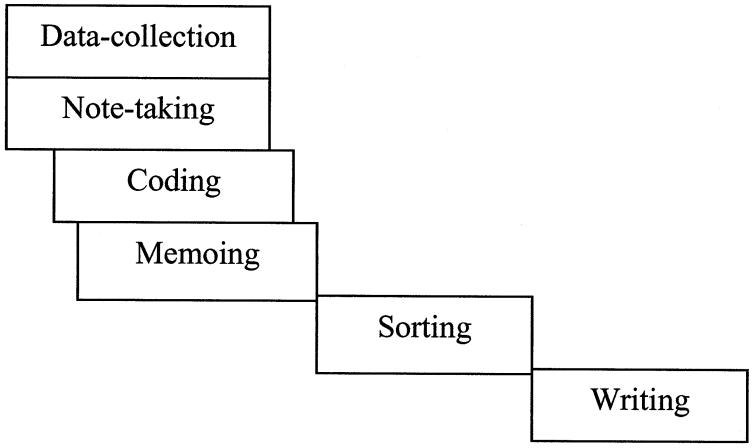
Memoing, phase four, is usually done concurrently with coding. As categories arise and relationships become evident, the coder makes notes to self or memos to aid in the development of the hypotheses which will be gradually moulded into theory. Once the memos are complete, they are sorted and ordered in phase five. This is most often completed by literally spreading out the memos on a large table and arranging them in groups and then aligning the groups into a logical order. The resultant group sequence will provide the structure of the theory. The final phase is to amalgamate the sorted memos into a written report. The goal of the writing phase is to provide a solid argument in support of the emergent theory. Dick's (2002) graphic representation of the phases is displayed in Figure 1.

Grounded theory is not without its critics who consider it unscientific inductivism however Haig (1995) supports its strength as "currently the most comprehensive qualitative research methodology available." (p. 1) Developed for research in the social sciences, Haig suggests it is suitable for the study of

nursing. This can be certainly be extrapolated to the study of allied health professionals. Grounded theory allows for a dynamic approach to making sense of a situation, a theory developed through an ongoing comparative review. It is a good fit for this research project.

Figure 1

Phases of Grounded Theory (Dick, 2002)



Data Collection

After receiving ethics approval, participants were requested to participate by the researcher at the monthly meeting of PTs. Eight volunteers agreed to participate and semi-structured interviews (Appendix A) were conducted as per schedule in Appendix B. Following an explanation of the study, participants were given an opportunity to read the research information letter and ask any questions. Participants were assured that personal information would be kept confidential and that they could request to withdraw from the study at any time without consequence. Signed consents (Appendix C) were then obtained. Each participant was provided with a copy of the information sheet and their signed consent. Interviews were held in a quiet office for privacy and were audio taped. The interviews were all completed within the 45 to 60 minute time frame which was proposed and consented to. Each participant was assigned a unique, non-identifiable code. The tapes were then transcribed for review. Grounded Theory methodology was employed for data analysis.

Participants

All participants were PTs and each chose to participate voluntarily. Participant names were removed from the data collected and the identifiers M1 to M4 for the experienced PTs and R1 to R4 for the inexperienced PTs were used. All participants work within a team of multidisciplinary professionals. These teams work within a specialty area of the organization. Only one participant reported having their own computer at work while all others mentioned that they shared a computer with several other staff members. All computer desktops

within the organization have a network with default access to email, word processing, the Internet and an Intranet which houses an e-library.

Each participant completed a short demographic survey which inquired as to their age, years of clinical experience as a PT and in their current area of specialization, and computer skills and type of use at work. Table 1 summarizes the survey data.

Table 1
Physical Therapist Participants

Physical Therapists	Experienced (n = 4)	Recent Graduates (n = 4)
Age in Years (Categories: 20 – 34, 35 – 49, 50 +)	3 x 50 + yrs 1 x 35–49 yrs	4 x 20–34 yrs
Years of Experience as a PT Average (Range)	24 (11–38) yrs	1.75 (1–4) yrs
Years in Current Specialty Area Average (Range)	12.2 (4–27) yrs	1.4 (1–2.5) yrs
Computer Skill level (Categories: Novice, Average, Expert)	3 x Average 1 x Novice	4 x Average
Computer use at Work (Categories: Daily, Every 2-3 days, Weekly, Less than Weekly)	4 x Daily	3 x Daily 1 x 2 - 3 days
Computer Programs used at Work (Categories: Email, Word Processing (WP), Schedule, Internet, Intranet, Other)	4 x Email 4 x WP 4 x Internet 2 x Intranet	4 x Email 3 x WP 4 x Internet 2 x Intranet

Chapter 4: Findings

This section presents the findings from the analysis of the data. The interview questions (Appendix A) were structured as to capture information in basically four areas: the participant's working environment (functioning of the multidisciplinary team), their practice for making daily clinical decisions with individual patients, their practice when planning patient care for a population of patients and their actions for keeping themselves current. The main intent was to examine two components of the clinical decision-making habits of the PTs which include the processes followed for clinical decision support and the type or content of the information used to support the decisions. In other words, what type of information did the PTs need to assist them in making decisions and where did they go to find it? Clinical decisions were divided in daily, real time decisions and planning decisions. The PTs were also asked about their ongoing professional development. To set the stage for these questions, the PTs were first asked about the social environment of their workplace, the multidisciplinary team and how well it functioned. Although this was included as a warm-up question, it was clear as the interviews progressed that the multidisciplinary team itself was an integral part of the clinical decision-making processes for these PTs.

The data was handled as described earlier. Phrases and/or sentences from the transcripts of the responses were coded and grouped according to the subject. Several core themes began to emerge. Along with the themes from each of the interview question sections, some overarching and recurring themes not specifically asked about, emerged as the interviews progressed. These were

related to use of technology and time management and were also tracked and memoed. An excerpt illustrating the data coding and memoing procedure followed is included in Appendix D.

Information about the participant's team provided a basis for understanding the individual PT's daily work environment. The coding resulted in two categories – high and low functioning teams. High functioning teams were those where participants reported regular opportunity to discuss clinical decisions with the whole team and where the responses suggested all team members were respected and their input was valued.

... respect each other's talent and make use of it (M1)

... work very closely with the physicians, nurses, dietitians ... (M3)

... have rounds weekly (M2)

... opportunity to speak and be heard, respected by other individuals (M3)

Low functioning teams did not meet regularly as a whole group and the respondents reported feeling that their input was not often valued or even requested.

... it is like the physio is not part of the team (R1)

... rehab takes a back burner (R1)

... very little contact with the physicians (M4)

... not asked for our opinions (R1)

The PTs take pride in being respected members of their multidisciplinary team. They strive to work cooperatively. The opportunity to meet with the whole team in a face-to-face meeting or, what is usually referred to as rounds in the healthcare

industry, was highly valued by PTs. Equal participation and being asked for their PT perspective in treatment planning was also expected. Although the PTs appreciated the many roles on their multidisciplinary teams, the physician is still considered as the key player. On those teams where physician contact is rare, the PTs displayed some frustration. They did not feel as supported in their clinical decisions. How well the team functioned did have ramifications for the clinical decision-making processes followed by the PTs. These will become clearer as the findings are presented.

In acute care the pace of work is fast and decisions must be made quickly. Caseloads are heavy and although most of the patients' problems or conditions are similar in an area of specialized care, there are frequently patients with a comorbidity or an additional condition. This condition would require the PT to stop and consider whether the normal treatment for patients in this area would be appropriate or if there should be some change in the care. This is an example of a situation where a PT would need to make a daily clinical decision, one involving a unique patient. This circumstance was posed to the PTs. Interestingly, almost every respondent commented that they faced that type of situation in the very recent past and proceeded to describe it. One such recollection came from an experienced PT who worked in the Cardiac Sciences area. He spoke about receiving a patient who had suffered a heart attack following surgery to amputate one of his legs. In this case, the PT was uncertain about whether the patient could be mobilized (gotten up and out of bed) as quickly as a regular cardiac patient, because of the amputation. He also needed to make clinical decisions about how

to rehabilitate the patient who would now be functioning with only one leg. The cardiac care would be familiar to the PT but the implications from the patient's orthopedic condition would require additional information to address.

This example illustrates well what a daily PT clinical decision might involve and when this question was posed it was assumed that the PT would need more than their own experience to deal with the situation. Consistently the PTs described that typically they would consult another professional, look in a textbook or manual and/or complete a generic Internet search.

> … just go to the Senior therapist (R4)
>
> … back and forth to the Ortho PTs (M4)
>
> … ask the nursing staff (R3)
>
> … usually do a Google search (R2)
>
> … read the old Primer … the bible (M1)
>
> … go to the physician first (M3)

The ability to make in-house consultations with peer specialists from many areas is appreciated by acute care PTs. Confirming the proposed treatment with the attending physician to ensure their support is also a common practice. Textbooks and primers specific to the specialty area are dog eared from frequent use and two PTs actually referred to these materials as "bibles". (M1 & M2) However, the electronic search is definitely beginning to encroach on the hard copy territory. For many of the PTs, quick access on the Internet equated to conducting a Google or Yahoo search. Background information uncovered with a search engine may be at a layman's level; however PTs find it of value when combined with their

experience. The PTs generally did not access online resources via the Intranet e-library.

In terms of content, the PTs responded that they were looking for basic, background information about the patient's comorbidity.

... get my hands on any kind of basic info (R1)

... just a general description, you can start there (R4)

... enough to give me a clue (M1)

The PTs did not feel that they required detailed PT treatment information but rather that they were in search of information about the condition in question, its symptoms and possibly suggestions for management of those symptoms. Using the basic information and their experience, a problem solving approach was employed with a resultant professional judgement. The normal treatment protocol would then be adapted to compensate for the patient's condition.

Of note is that for these daily clinical decisions, the PTs responded that they were unlikely to access the research literature. This could explain, in part, why the e-library, which is heavily weighted with research literature, is not used by the PTs for daily decisions. A few PTs commented about the specificity of research and how it would not be helpful or applicable to most of their complicated patients. Research literature requires not only reading but reflection and appraisal, too time consuming for a busy clinician who just wants to know the basics about condition X. "I am not looking through hundreds of articles, just something quickly." (M1)

Next, The PTs were asked about their preparation when planning for care of a new group of patients. Once again most of the PTs could relate an example. One PT described the process he had undertaken when asked to develop the physical therapy program for patients undergoing a new transplantation procedure. Another PT spoke about the revision and redevelopment of the physical therapy treatment for patients with a surgical repair to the Brachial Plexus, the main nerve bundle to the arm. Their responses suggested that planning for providing care is usually handled like a special project.

Along with the modes of information access revealed for daily clinical decision-making (consulting of team members, in-house experts, textbooks and the Internet) the project would expand to include careful evaluation of the literature, benchmarking and surveying of other similar acute care hospitals' practice, attending public forums and if possible, attending courses or spending time with a mentor in the new specialty. The PT's own experience and its application to a new area are also central to the planning process.

... use my experience with similar populations (R1)

... go to the literature or ... I would go to JS (Senior PT) (R4)

... pass it by the physician (M3)

... write to a number of programs in different cities (M1)

... use a librarian to do a lit search (M1)

... attend a course ... brought in a lot of experts (M2)

... follow one of the PTs around (R3)

It was quite clear that for this type of undertaking, a significant amount of time was required. Consequently PTs must find program development time when a new population will become part of their caseload. At the same time, it was clear that a comprehensive updating of a current treatment program could only be tackled about once every couple of years. Information may be gathered on an ongoing basis but major changes to current practices typically occurred following a thorough review process. This type of work is seen as fundamental to providing good PT care but at the same time, it is frequently put on the back burner because of daily patient caseload demands.

It is predictable that a wider range of information resources would be accessed when a PT is in planning mode versus when making a daily clinical decision. What is of note though is the shift in content emphasis. When asked specifically about how valuable the research literature was in planning clinical decisions, all PTs agreed it was crucial. Overall, the PTs stressed the value of research literature, its appraisal and potential incorporation into the new treatment regime. Much energy is spent combing scientific journals. Most respondents suggested that they go to the literature themselves while one PT spoke of resourcing a librarian. When probed about how they go to the literature, most suggested they made a trip to the health sciences library to look for journal articles. Only two of the PTs spoke knowledgeably about using online databases although all suggested they may use one. Only one of these two PTs reported using these databases via the Intranet e-library. When asked specifically about the e-library, most other PTs claimed to know about it and said that they had used it

in the past. Further probing about some of the e-library features revealed that they were not very familiar with it. Three of the inexperienced PTs thought they "may have heard about it" (R2, R3 & R4) but admitted to never having used it.

Benchmarking the practice at other healthcare organizations has been a more recent addition to the planning process. Whereas consulting with external professionals has been done for many years, benchmarking has more of an administrative bend to it. Along with finding out what type of clinical care is being provided to a similar population at another institution, statistics about staffing costs, timelines, and so forth are typically gathered. Benchmarking reflects the requirement for frontline clinicians to include cost effectiveness in treatment planning.

One respondent spoke quite extensively about gathering information from layman sources such as patient support group newsletters, public education forums and association websites. Another PT reported that he often read health magazines and when it came across a fitness suggestion, for example, he might adapt it for trial with the population he was developing a treatment program for.

Like the practice for most healthcare professionals, the work for PTs is both analytical and skill based. These are not desk jobs. PT practice involves assessment and treatment which often results in some type of hands-on intervention with patients. It is logical that PTs would also value attendance at courses or job shadowing with another PT working in the specialty. Attendance at courses is not as frequent as most PTs would like, due mostly to the cost, the time involved and the availability of specialty specific courses. Having an

opportunity to "follow one of the PTs around" (R3) was a theme in the responses, especially from the inexperienced PTs. Seeing the PT care in action, being able to ask questions and studying a mentor's technique reflect the appreciation for an apprenticeship type opportunity.

Once information is compiled from these various sources, PTs reported that they may spend many hours, most often with their coworkers, filtering and reviewing the information. Hence, development can take several months of refining and consensus building with all team members, before a program is finalized and implemented. A consistent remark made by the PTs in response to the planning question was how important it was to have the physician's support. PTs expressed appreciation for their team setting but clearly a hierarchy is present, with the physician at the top. PTs who work more independently may implement a new or updated practice after reviewing the gathered information. However, these PTs projected some apprehension about introducing or changing a practice, even with significant support for it in the research literature and the benchmarking, without a thorough discussion with the physician in their specialty. A few PTs reported that they had blanket approval ("They pretty much give us free reign", R2) to do as they see fit but the level of risk of the proposed clinical decision also at a bearing on whether the PT would incorporate it without physician input. PTs were cautious if they felt there could be any chance of serious consequence to patients. Again the influence of the multidisciplinary team and particularly the physician was obvious. In the end, it is possible that a

PT clinical decision that is well supported and practiced elsewhere may take months to years to be integrated or may not be introduced at all.

In the last section, PTs were asked about their general professional development practices. Similar to planning clinical decisions, courses and conferences were valued and in response to this question, were usually mentioned first. Reading favorite professional journals also kept them up to date. They usually accessed these in a more portable hard copy. Shared computer access at work as prohibitive to searching for or reading long articles, was mentioned by many of the PTs.

Despite the physical work environment obstacles, technology is beginning to make inroads into PT practice. Email is checked daily by most PTs although information exchanged in emails tends to be more administrative in nature. Joining a subscribers' list for electronic newsletters and literature reviews has not yet become widespread but a select few have discovered these types of resources.

Time to just surf and explore on the computer at work is in short supply. Going to the computer remains an activity outside the typical work flow and is fit in around the real work of looking after patients. Skills for use of the electronic resources are also underdeveloped. At the same time, PTs are aware of the volume of information that could be accessed. It becomes daunting for most. None of the PTs expressed that they lacked practice information. It was more a matter of finding the time to read and appraise it properly.

One of the unexpected themes to emerge throughout the interviews was the lack of difference in how experienced and inexperienced PTs approached clinical decisions. Although this was certainly not a sample size from which generalizations can be drawn, it remains surprising that the inexperienced PTs referred constantly to using their own experience and commonsense.

Alot of what I do … is commonsense and it is hard to find evidence for that. (R1)

Probably 90% of clinical decisions are based on experience to date. (R3)

These PTs received their professional training in an era of technology integration in post secondary education and they had worked in their areas for an average of only 1.4 years. It was expected that they would be much keener to use research evidence via an electronic database for clinical decision support, for example. All of these PTs, though, suggested that they did not tend to use the same decision-making model which they had been taught as students. It appears that they already place heavy weighting on their tacit knowledge. They also suggested that they felt a practical reality that hit them as graduates - time. Thinking on your feet does not appear to be optional in acute care.

There is no shortage of information to resource but only a shortage of time and in some cases skill, for information evaluation and integration. Synchronous forms of communication, peer consultation, rounds, courses, conferences, continue to be most highly valued. The multidisciplinary team plays a very influential role in daily but more so, in planning types of clinical decisions. Although the PTs appreciated and advocate for being part of a team, the reality is

that having to build consensus and ensure all parts of patient care are seamless can be a decision process that stretches for months or more. Research literature and what is happening in other organizations plays a central role in care planning but not on a daily basis. When considering their caseload for today, the PTs are observing the symptoms of individual patients and prefer quick basic information to combine with their experience. Research literature is seen as too specific and too time consuming to filter, for the types of clinical decisions made daily. Electronic information is beginning to become part of the PTs' workplace however there remains a gap. Accessing clinical decision support online has not yet become a normal work routine. This group of PTs works at a fast pace and considers the care of patients and the daily clinical decisions that go with that work as their main focus.

Chapter 5: Discussion

The findings of this research project concur with those of other authors. Similar to the nurses in the study by Thompson et al. (2001) and the community therapists in the work done by Rappolt and Tassone (2002), the PTs first and foremost valued human sources for clinical decision support. Those human sources were often other PTs, however the PTs also consulted with other professionals regularly. PTs reported using specialty specific textbooks and manuals which are comparable to the local information sources discussed by Thompson et al. (2001). The PTs in this study did report making use of technology for daily decisions in the form of a Google or Yahoo search for basic information.

The PTs expressed some of the same concerns as the American PTs surveyed by Jette et al. (2003). The inabilities to effectively appraise and integrate research literature into practice were points of commonality. Although the Jette work was a large survey and this research project involved a small number of participants, it is interesting to note that Jette found those PTs who had recently graduated to be more proficient in using technology than more experienced PTs. The inexperienced PTs may indeed be more proficient than the experienced PTs interviewed in this study, however, they do follow the same type of process as the experienced PTs for making clinical decisions. They did not use technological resources any more often than the experienced PTs.

One very strongly shared theme in both studies was the pressure of time. Like the American PTs, all the PTs reported knowing about and wishing to be

able to do more in the way of journal reading, attending courses and using technology to access research information. Both groups of PTs felt that the demands of caring for a large caseload of patients did not leave much work time for these important but nonetheless, indirect work duties.

Stetler's (2003) assertion that high quality practice cannot be achieved by individual clinicians alone but requires organizational support, strong leadership, effective teams and efficient use of information technologies is well supported by the responses of the PTs. All spoke of the importance of being an equal member of their specialty multidisciplinary team and having the opportunity to meet regularly with the whole group. Those who described their team as low functioning also reported some reluctance to incorporate new practices without the team and physician's support. On the contrary, those PTs who felt their team functioned very well reported that the team typically reviewed new information and made clinical decisions together. There was certainly a sense that those PTs felt their clinical decisions were respected and that they were, as a team, providing an excellent standard of care.

A couple of the PTs described a very comprehensive approach to clinical decision-making. Although these two PTs used the same types of resources as the majority interviewed, they also had a solid grasp on how information technology could augment their knowledge acquisition. They regularly access clinical information services like MDConsult and Medscape which offer a wide variety of resources including current, peer appraised journal articles, patient education handouts, specialty specific newsletters and conference proceedings. One PT also

maximized her association memberships by subscribing to e-newsletters and by visiting professional and patient chat rooms. This allowed her to stay in tune with what patients were are currently "talking about". (M1) Berwick (2003), in applying Rogers' Diffusion of Innovation theory, would classify both these PTs as early adopters within their healthcare organization. They have taken the technology and begun to groom it to add to their clinical decision support systems. Berwick would suggest these frontline workers should be encouraged and given the opportunity to share their practice. Although the resources they are using are available to all, their innovation is in how they have integrated those resources into their busy clinical practices.

The PTs are representative of what many authors report in terms of the integration of information technology into the workplace. As Parker and Coiera (2000) discovered in their work with healthcare providers, the PTs also preferred synchronous modes of communication whether it was for daily clinical work, planning work or for professional development. Face-to-face encounters were highly valued. Luxenberg et al. (1997) suggests the reason healthcare providers are less likely to utilize information technologies because of the amount of time a provider would need to dedicate to becoming proficient. The PTs certainly voiced a concern about lack of time; however, there may also be a preference for synchronous human encounters because so much of the work done by PTs is skill based. Obviously having a hands-on session with a course instructor or an experienced colleague in which a treatment intervention can be demonstrated,

practiced and corrected, is more desirable than simply reading about the intervention in a journal article.

Overall, though, there was a sense from the PTs that they are aware of the vast amounts of clinical information available. They also realized that technology can open the door to these volumes. With access to the well stocked e-library, why do the PTs not use it as an adjunct to their clinical decision-making? Certainly the administration, who foots the bill for the e-library, must believe it is of value and want all employees to make use of it. The application of Giddens' (1984) Structuration Theory can assist in understanding this situation. Orlikowski's (1992) Structurational Model of Technology can be used to more specifically analyze the gap between the potential capabilities of the current technology and the current use of that technology by the PTs.

Giddens' (1984) general theory of social systems, Structuration Theory, as introduced earlier, is centered on humans or actors and their patterns of interactions or structures. Actors and structures are a duality that is mutual and interrelated.

The actors possess knowledge, both practical and tacit knowledge. Practical or implicit knowledge is obvious and can be easily shared while tacit knowledge is usually gained by experience and is not easily expressed. Structures are the outcomes of social interaction between and among the actors which occur over time. These structures become habitual within an organization.

Three elements are common and overlapping in structures – meaning, power and norms. Meaning is the shared perspective or understanding of the

actors which becomes significant within an organization. Power refers to the capacity to transform or effect change. The power may extend socially over other actors and/or over material resources. Giddens recognizes the asymmetrical authority of organizations but also concedes that subordinate actors can cause transformation. Norms are basically the unwritten code of conduct for organizations, consisting of certain behaviours or traditions which are consciously or unconsciously sanctioned and other behaviours or traditions which are not.

Structures become part of the actors' routines. The routines continually reaffirm themselves because of their repetition and the actors' relationship to past similar routines. The cycle results in an organizational reality or its institutional properties. This institutionalization may seem to be in a steady state but is actually flexible. That flexibility depends on new interactions between the actors and structures. How dynamic an organization is depends on how quickly and how profoundly it can be transformed by what Giddens (1984) refers to as "episodes of change". Episodes cause varying degrees of change depending on their origin, type, momentum and direction.

Orlikowski (1992) takes Giddens' concept of duality between actors and structures and focuses it on technology.

> Technology is physically constructed by actors working in a given social context, and technology is socially constructed by actors through the different meanings they attach to it and the various features they emphasize and use. However, it is also the case that once developed and deployed, technology tends to become reified and institutionalized, losing

> its connection with the human agents that construed it or gave it meaning, and it appears to be part of the objective, structural properties of the organization. (p. 406)

Technology is both designed and used by humans. In addition, it exists in the context of an organization which influences how it is customized to fit within the institutionalization of that organization. Humans within the organization can choose to accept or resist a technology and are likely to modify it in its use. This modification results in a dynamic technology, not always used as originally intended.

The PTs work within an established industry and in an organization that itself is over 50 years old. Although healthcare has seen many changes over the last decade, there remain some fairly solid, historical social structures within the work environment. There are some structures which are strongly supported and have been norms for many years. Being part of a multidisciplinary team and consulting experts are two social encounters considered by all the PTs to be cornerstones of clinical practice. It was clear that being an active part of the team was desired and expected if truly excellent care was to be given to patients. Some PTs expressed frustration and disappointment because the team, in their area, did not meet regularly and they were not an equal member of the team. Belonging to a team and meeting with it regularly were expected norms from the PTs' perspective.

The sanctioned leader of this multidisciplinary team structure is the physician and there remains a power imbalance within this structure in the ability

for changes to be made by other than physician members. For changes of any significance, the physician has to be in agreement and this is generally accepted by all. To that point, some PTs working within a low functioning team reported that they would be reluctant to implement a new clinical decision without a clear mandate to do so from the team and most notably the physician lead. Conversely, a well tuned team, where the team members including the physician are knowledgeable about and supportive of the care provided by each member, promotes the shared meaning of that structure. The power within the structure is more balanced and so, in effect, members other than the physicians have an increased ability to bring about change. Clinical decisions introduced by any team member would be given their due consideration. The multidisciplinary team structure is highly thought of by both those working within a well functioning team and by those wishing their team functioned better.

Expert consultation for the PTs involves the resourcing of either another PT or another multidisciplinary team member who has or is believed to have more knowledge. Again, a dominant actor is often the physician, whose agreement or in some circumstances permission (a doctor's order) is required to proceed with implementation of a clinical decision. This is an example of another embedded structure and is common throughout healthcare. It does seem to be commonsense that if a PT saw a patient and was unable to make a clinical decision about appropriate treatment using just their own experience, then a more experienced professional should be resourced. Several authors (Thompson et al., 2001, Rappolt and Tassone, 2002, Thomson O'Brien et al., 1998) however have raised a

red flag with this expert consultation structure. This structure is based on an assumption that the information provided by the perceived expert is best practice and evidence based. Thompson et al. (2001) suggests that the assumption is dangerous, that in some cases the expert is really not up-to-date. They challenge this traditional structure, calling for assurance that the expert actors within organizations are indeed truly knowledgeable. Overall, the PTs interviewed demonstrated full support for the structure and its underlying assumption. A subtle difference was detected between the inexperienced PTs, who placed trust in all experienced clinicians, and the experienced PTs, who appeared more selective in which experts they consulted with. Possibly the Thompson et al. concern is actually addressed discreetly, over time within this structure. Real experts are sanctioned by their ability to provide useful knowledge over the long term.

Attending courses and benchmarking other organizations are variations on the expert consultation theme. Courses are taught or presented by those who have knowledge and experience in a field. Benchmarking is a process that assumes to some degree that a similar healthcare team at another acute care institution is providing good, up-to-date care. Caution is also advised here. In any case the expert consultation structure fits with the nature of work for PTs and appears to be alive and well.

The use of reference textbooks and manuals is another ingrained structure. The PTs have full trust in the knowledge contained in these "bibles". (M1 & M2) These resources are sanctioned by the whole multidisciplinary team, giving them added credibility. Can this structure be changed? It could be argued that the PTs'

action of resourcing Internet sites for basic information is a challenge to or an episode of change for this structure. Hard copy textbooks do go out of date, granted it happens relatively slowly with the type of the information in these books. Nonetheless, the PTs appear to be gradually moving to the e-version of this type of information with generic Internet searches, MDConsult and similar medical information services. PTs are not ready to leave behind their bibles but many are starting to find electronic mini-bibles or credible websites. The momentum is present and the structure is changing. One concrete obstacle at present is the physical reality of having to share computers but it does appear to be slowly transforming.

Administrators, who supply the budget for technology and software like the e-library, would be pleased to know that PTs are starting to use the computer more for clinical decision support. However, the fact that the extent to which most PTs are using it is to Google a term rather than to search and appraise research literature via the very expensive databases may be disappointing. Orlikowski's (1992) Structurational Model of Technology might suggest the PTs are simply avoiding the use of the technology. Despite the push from outside to practice evidence based medicine, life on the frontline most days does not definitively require access to research literature. The PTs can obtain research literature in hard copy and at this point in time, that is still the most familiar way to access it.

Total avoidance, however, is probably not accurate as the PTs are using the technology at times to search the Internet. One of the PTs was actually using

the e-library on a regular basis. This does demonstrate what Orlikowski (1992) refers to as "interpretive flexibility" (p. 405). The technology (the network with both the Internet and an Intranet) was designed to provide clinical decision support (among other things). At this point because of the nature of the PTs' work, there remains a disconnection between what was intended by the designers, supported by the administrators and what is used by the PTs. The designers have put together a number of software resources for what they believe provide efficient ways to search and retrieve research literature. The administrators' support has come in the form of making computers with the network technology relatively accessible to the frontline staff. Orlikowski would call this the "design mode" (p. 408) of the interpretive flexibility. The PTs as end-users have retained control over the "use mode" (p. 408) and subsequently they are currently using the technology rather superficially compared to its potential and what the designers envisioned.

Each PT's use of the technology is partly influenced by their individual interactions with it. If an Internet search turns up a wealth of good information for a daily clinical decision, the PT is likely to use the technology again when information is needed. More practically, if the PT can easily access a computer terminal, the use of the technology will be more successful. The pattern of use is reinforced, the technology has a facilitating effect, and it is used again and again.

Use of the technology may not always have a positive effect on the work of the PT. The PTs did admit there is no shortage of information to be accessed however using the technology and retrieving vast amounts of research

information, for example, may be constraining. If the PT becomes overwhelmed, the episode may mask the potential benefit of receiving all the information. The success of the information retrieval may in itself have a reverse effect on the PT who may choose to avoid the technology next time. At the same time, if the PT knows the information they require can be found electronically but they have a long wait for their turn on the computer terminal, they are likely to return to the bookshelf and thumb through the textbook or manual.

The organization and its "institutional properties" (Giddens, 1984) also influence the use of the technology. The PTs were consistent in expressing the pressures of time within their workday. Time could be an additional factor in the situation just discussed and one which decides whether the technology is facilitating or constraining. Assuming the PT can access a computer terminal and the technology assists the PT to access an abundance of information, there needs then to be additional time allocated to read and appraise the information. Evaluating the information with the multidisciplinary team members, a highly sanctioned social structure, would follow. Paradoxically, the use of technology to quickly access quantities of information may actually require an additional time commitment to allow for complete processing of the information. If workdays are already overfilled with caring for individual patients as suggested by many of the PTs, then something else would have to give.

Several social structures are intertwined around the action of clinical decision-making. The tried and true structures of multidisciplinary teams, expert consultation and using hard copy texts are front and center while the use of

technology has only begun to infiltrate. Although the technology is of excellent quality, its place in the daily work environment has not been firmly established. Time to learn and master the technology, along with strategic physical access points for the frontline are missing components. If the technology is to become part of a daily social structure in this organization, these components must be addressed.

Chapter 6: Conclusion

This study adds to the bodies of work on both clinical decision-making in healthcare and the integration of new information technologies into the workplace. Although this topic has been studied in other settings, this project is unique in that it helps to further the understanding of a specific group, PTs in an acute healthcare setting. The findings is this study echo those of other healthcare researchers (Thompson et al., 2001, Rappolt and Tassone, 2002, Jette et al., 2003) and those researching the integration of technology (Orlikowski, 1996, Townsend, DeMarie and Hendrickson, 1998, Kouroubali, 2002). At the same time some unexpected results were uncovered. The multidisciplinary team as a social structure for clinical decision-making has great significance for the PTs in this acute care setting. Expert consultation of other PTs was also a common action but support of the team and especially the physician were truly central to many of the clinical practice decisions made. Also quite surprising were the techno-capable, inexperienced PTs who had adopted a similar model for clinical decision-making as the more experienced PTs used. Generally, they used their experience before technology, even though they were schooled with databases and e-library resources for problem solving and had good computer skills.

As this was a qualitative research project, it endeavoured to study a group in depth. A survey of all the PTs, or even all allied health professionals, working in this acute care hospital would have provided a larger sample size but the individual semi-structured interviewing method offered a more detailed picture of the situation. Considering the similarity in decision support structures and general

practice for all allied health professionals in acute care, the findings here may still be transferable to others in this category.

The researcher was also the interviewer and was a PT colleague of the participants. To some degree this is a limitation in that the interviewees may have felt pressure to provide "correct" answers. Every effort was made to reassure the participants that this project was independent of their workplace. It did appear that the PTs spoke openly, "To be honest I don't do Intranet." (M1) Repeated themes in the responses also suggested that the participants felt free to truly share their clinical decision-making experiences.

PTs are focused on providing good care to their patients. They enjoy and appreciate the multidisciplinary approach practised in the acute care hospital setting. The PTs are keen to keep themselves current and practise evidence based medicine. They feel strongly about having consensus from their team before introducing any radical change within their physical therapy care regime. While this is reflective of the strength of the multidisciplinary team as a social structure, it can also be a factor in how long it takes a new practice to be introduced. There was a sense that even with ample evidence in the literature and knowledge that other centers were on board with a certain practice, the team may review and ultimately reject it or want to study it further with their own patient population. Integration was not a given. "You have to decide whether it applies to our practice or whether you know, you let it go." (M1) The PTs also spoke of how many research findings were "too specific" (R3) for their complex patients.

These may be considerations for those concerned about a lack of evidence based practice in daily practice. These PTs suggested that they were current and constantly gathering clinical information. However, integration appears more complicated than reading about a well designed study and implementing the recommendations described within it. PTs see their care as part of a collaborative effort. The project management approach which they described represents an efficient way to ensure treatment regimes are reviewed regularly. These regimes are not static but rather an iterative process. Fine tuning depending on patient reaction was constant. "We try it with the patients and monitor it closely with the physicians." (M2) Again, this all takes time and may partly account for the apparent "knowing-doing gap" (Pfeffer and Sutton, 2000, p. 85) which has alarmed the evidence based practice community.

If indeed new information is being processed and rejected, possibly it is in part due to the type of research done and reported in the literature. It may simply not fit the setting. More ethnographic study or action research of multidisciplinary care teams, the collective treatment approach and the organizational supports and barriers to team treatment of complex patients is indicated. The evidence based practice proponents strongly advocate in favour of quantitative research but clinical research that more closely mirrors the multifactorial frontline situation is also needed.

The PTs highly valued their own experience along with that of others. Even new graduates felt they had sufficient tacit knowledge in many situations to make quality clinical decisions. Consulting others is well established structure

and closely relate to the multidisciplinary team structure. Venues for discussion of patients and practice in general are considered essential for providing a high standard of care. Despite a plethora of communication modes such as patient charts, email, Intranet and pagers, rounds, the age old, face-to-face meeting remains solidly out front in terms of preference and perceived effectiveness. "We work very closely and have rounds weekly where the team sits down and all disciplines have time to voice their opinions or concerns." (M3) Continued organizational support for regular rounds in all specialties is recommended.

Time for indirect patient care activities such as rounds, literature reviews and program planning is at a premium. Certainly the rapid pace of work in this institution was a constant theme. Daily pressure for ensuring a patient caseload is covered makes it difficult to integrate new job skills. The PTs know information technologies can improve their efficiency but the time required for initial learning and the obstacle of scarce hardware, can be constraining. Add to that the sense of information overload when volumes of new materials require appraisal. Despite these hurdles, a few PTs have learned to navigate these technologies. The expert consultation model could be employed with information technologies as well. Like sharing their patient care expertise, these lead users of technologies could share their computer navigation knowledge. Administrative encouragement and support would be essential as currently there is a reluctance to spend time on learning these types of skills.

Clinical decision-making for PTs and all other healthcare providers can be complex. Timely basic information is desirable for bedside professional

judgements. The research literature comes into play more prominently in planning decisions. The PTs are practicing their own modified version of evidence based medicine. The multidisciplinary team is a strong force and crucial decisions are not made without the team's input and support. Technology is beginning to play a larger role in decision support but as an adjunct, not a replacement, to the well established social structures.

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Appendix A

Interview Tool

Please complete the following questions.

Demographic Information:

Name: _____

Age: 20 to 34 35 to 49 50 +

Year of graduation from Physical Therapy: _____

Number of years of experience in current specialty area: _____

List the professional disciplines on the team with whom you work on a daily or weekly basis:

_____

_____

_____

How would you rate yourself in terms of computer skill level?

Novice Average Expert

How often do you use the computer at work?

Daily Every 2nd or 3rd Day Weekly Less than weekly

What do you use the computer at work to do?

- ❑ Email
- ❑ Word Processing / Create Presentations
- ❑ Schedule
- ❑ Internet
- ❑ Intranet
- ❑ Other: _____

Thank you for completing this and agreeing to participate in an interview.

Interview Questions

Team Environment:

- Please describe your Physical Therapy team. How well does your PT team function?
- Can you expand your description to the interdisciplinary team in your speciality? How well does the team function?

Making Daily Clinical Decisions:

- What do you do if say, you have a patient who is presenting with a condition that is not commonly seen in your specialty area and you must decide about the physical therapy care that is most appropriate for that patient? How do you go about making a clinical decision about the care of that patient? Probe: How would you describe your support network when making clinical decisions?
- How important is your PT team in daily clinical decision-making?
- How important is your interdisciplinary team in daily clinical decision-making?
- How important is research literature in daily clinical decision-making?

Making Clinical Decision relating to Planning:

- Let's say the area you are working in is now going to include patients who undergo a new procedure or surgery. In essence, you will be seeing a new group of patients for whom you will need to plan their physical therapy care. What have you done in the past or would you do if your area of practice changes?
- What have you done or would you do if you, yourself were moving to a new practice area? How would you plan for caring for patients in that new area?
- How important is your PT team when making clinical decision related to planning?
- How important is your interdisciplinary team when making clinical decision related to planning?
- How important is research literature when making clinical decision related to planning?

4

Ongoing Knowledge Acquisition:

- What information sources do you access to keep yourself current, for your own continued professional development?

- Are there any other comments you would like to make or any questions you would like to ask?

Note: Generally probing questions for each of the above categories will ask: Why are certain resources accessed? What is the level of confidence/trust in the information sources typically accessed? Do these sources provide relevant information which can be incorporated with existing knowledge? Are there other resources not currently accessed? Why are these not accessed? What are some of the obstacles to access?

The interviewer will ask the questions listed above, generally in the order listed. Probing or clarifying questions will be asked as required.

Appendix B

Schedule of Interviews

Tuesday July 6, 2004	M1
Monday July 12, 2004	M2
Tuesday July 13, 2004	M3
Tuesday July 13, 2004	R1
Friday July 16, 2004	M4
Friday July 16, 2004	R2
Wednesday July 21, 2004	R3
Wednesday July 21, 2004	R4

Appendix C
Research Information Letter

TITLE: Evaluation of the Clinical Decision-Making Practices of Physical Therapists Working Within an Acute Care Healthcare Setting

INVESTIGATOR: Bernadette Martin, B Sc Physical Therapy,
MACT candidate
780-407- 1212
bmartin@cha.ab.ca

PURPOSE: Healthcare providers make clinical decisions each day. Decisions include deciding about the needs of a specific patient or deciding about the needs of a new population of patients.

The purpose of this project is to explore how physical therapists approach clinical decisions. I am interested in finding out more about what information and knowledge resources are available to you and which you find most valuable. I am also interested in the challenges you might face when making clinical decisions and the role of the interdisciplinary team in clinical decisions.

This project is part of my requirements for completion of a Masters of Arts in Communications and Technology (MACT) degree.

BACKGROUND: Understanding how you make clinical decisions is important. You strive to provide up to date and evidence based physical therapy care to patients. You require access to appropriate and useful information resources. Knowing which resources you find most useful, relevant and practical may offer recommendations for professional development and continuing competency education design. All participants in this study will be clinical physical therapists who are employed by Capital Health and are working at the University of Alberta and Stollery Children's hospitals.

PROCEDURES: You will be asked to attend one face-to-face interview. The interview session will require take approximately 45 to 60 minutes. You will be asked to complete a form including general questions about your experience as a physical therapist and computer skills. Then I will interview you. The interview will include questions about how you make daily clinical decisions and planning decisions. I will ask you why you choose the resources that you do.

The interview will be audiotaped. Following the interview, I will make a written copy of the audiotaped conversation to be used for analysis. The audiotapes and written copy will be retained in a secure office for 5 years and will then be destroyed.

BENEFITS: You may benefit by having the opportunity to share your clinical decision-making processes. Study findings will provide a clearer view of how acute care physical therapists make clinical decisions. This information could help in the design of professional development and continued competency education for physical therapists. You can receive a copy of the research report if you wish.

RISKS: There are no known personal risks for you.

CONFIDENTIALITY: My research supervisor, Dr. Marco Adria and I will be the only persons with access to the data collected. All information collected will be kept confidential. A code will be assigned to the information which you provide so that your identity will be protected. Your name and the name of the organization will not be included in any research reports.

FREEDOM TO WITHDRAWAL: You are free to withdraw from this study at any point without any adverse consequences. You do not have to provide a reason. You can also choose not to answer specific questions in the interview.

ADDITIONAL CONTACTS: If you have any concerns about any aspect of this study, you may contact my research supervisor, Dr. Marco Adria at 780-492-2254 or marco.adria@ualberta.ca with any questions or concerns.

This study has been reviewed and approved by the Faculties of Education and Extension Research Ethics Board (EE REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Chair of the EE REB at (780) 492-3751.

CONSENT FORM

TITLE: Evaluation of the Clinical Decision-Making Practices of Physical Therapists Working Within an Acute Care Healthcare Setting

INVESTIGATOR: Bernadette Martin, B Sc Physical Therapy,
MACT candidate
780-407- 1212
bmartin@cha.ab.ca

Do you understand that you have been asked to be in a research study?	Yes	No
Have you read and received a copy of the attached Information Sheet?	Yes	No
Do you understand the benefits and risks involved in taking part in this research study?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your employment.	Yes	No
Has the issue of confidentiality been explained to you? Do you understand who will have access to your records?	Yes	No

This study was explained to me by: _____

I agree to take part in this study.

_____	_____	_____
Signature of Research Participant	Date	Witness
_____		_____
Printed Name		Printed Name

I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.

_____	_____
Signature of Investigator	Date

Appendix D
Excerpt of Coding and Memoing

This represents an excerpt of the data coding and memoing procedure used to analyze the study data. The italicized phrases represent the coding from the respondents' transcripts (participant number in parenthesis). Responses were coded into the how the information was accessed and the content of the information.

Daily Clinical Decision-making:
How information was accessed.
... check would be the patient databank ... have the whole record there (R1)
... go to the Intranet and use StatRef or MDConsult (R1)
... in my professional judgement better for the patient, I wouldn't have any hesitation to implement it (R1)
... go to the Senior therapist ... or the Respiratory Therapists ... the Occupational Therapists ... sometimes outside resources (R2)
... sometimes just go to Yahoo (R2)
... ask the nursing staff... usually do a Google search... dependable resource books (R3)
...run it by JB (Senior PT) ...I talk to the patient ... usually have tons of information (R4)
... read the old Primer ... the bible of rheumatology (M1)
...don't do Intranet (M1) ...been through Google (M1)
...not looking through hundreds of articles, just something quickly (M1)
... when it is a specific patient, we have quite a resource of exercises and each other ... if we are unsure we ask her (M1)
...Hand Surgery and Rehab book, sort of our bible (M2)... talk to the surgeon (M2)
... go to the physician first ...coworkers ...I would go outside the hospital if I had to (M3)
... have not accessed specific(Internet) sites for info (M3)
...right next to Ortho, would go discuss it with them,get a hold of the physicians (M4)
... typically a regular (Internet) search (M4)

Content of the information.
... abit about the background (R1)
... figure out with commonsense, first approach (R2) ... might look in the literature (R2)
... get my hands on any kind of basic info (R2)
...databases, that is for more specific information,looking for just background info (R3)
...just a general description, start there (R4)
... I find I get enough to give me a clue without (lit search) (M1)
... many protocols for hands (M2)
... specific protocols or just general guidelines (M3)
...what I do is commonsense, is hard to find evidence for that (R1)
...90% of clinical decisions based on experience to date (R3)

Memos.

valued quick access to basic information or guidelines which could use as background
consulting with peers and coworkers was highly valued, even to just confirm
hard copy textbooks/primers referred to as "bibles"
only one used Intranet on a regular basis for access to online texts (not databases)
using Google or similar to find quick information about a condition
Research literature was not deemed to be very helpful with daily decision