KNOWLEDGE AND EDUCATION AT ENTRY TO NURSING PRACTICE IN ALBERTA

DECEMBER 2009
Knowledge and Education Project Steering Committee

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- College of Licensed Practical Nurses of Alberta (CLPNA)
- College of Registered Psychiatric Nurses of Alberta (CRPNA)
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Production of this research is made possible through the financial support of Alberta Health and Wellness. The views expressed herein do not necessarily represent the views of Alberta Health and Wellness or the Government of Alberta.
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EXECUTIVE SUMMARY

The Knowledge and Education Project (KEP) was undertaken to probe the knowledge bases of Licensed Practical Nurses (LPN), Registered Nurses (RN), and Registered Psychiatric Nurses (RPN), as these three designations are applied in the Health Professions Act of the Province of Alberta. It was hoped that this research might extend beyond increasing understanding of the relationship among the three knowledge bases to provide useful information to decision makers. Three goals guided the research:

1. To develop a replicable model and tools to analyze and describe educational program content and types and levels of knowledge acquired, across the professions.
2. To use the model and tools to analyze and describe the educational program content and depth and breadth of knowledge across the three nursing groups.
3. To determine the relationship between the information learned and how that can contribute to effective decision-making relative to optimal workforce utilization.

A fourth goal, to expand the project to incorporate other professional groups if resources permitted, was not pursued because of the need to devote the research team’s efforts to the three named above.

There was also considerable interest in developing a meta-model, a replicable research methodology or model which could be extrapolated to make comparisons between the knowledge bases of various other health care professionals. The development of the meta-model proceeded as an iterative process in concert with the rest of the study.

The Steering Committee chose to restrict the study to the knowledge held by novice nurses, defined as student nurses within sight of graduation. Five relevant sources of information were identified: (1) academic and professional literature relevant to the knowledge and education of nurses, (2) documents describing the scope of practice and expected competencies of the three nursing bodies, (3) documents pertaining to the academic programs which prepare the three types of nurses, (4) insights into preparation programs provided by program instructors who brought to bear their experiences as nurses and nurse educators, and (5) information provided by student nurses at the point of their induction into nursing.

The methodology applied in this study was qualitative in nature and guided by the concept of congruence. It was assumed that within each type of nurse there ought to be a "chain of congruence" leading from the legislation authorizing the existence of the type of nurse, through its scope of practice and competency statements, then to the curriculum documents which guide the academic programs and finally into the knowledge of the student nurses. It was further assumed that exploring the degree of congruence between knowledge instantiated across types of nurse would result in a comparative analysis of the underlying knowledge bases.

Ethics approval for the study was acquired from the Community Research Ethics Board of Alberta (CREBA) and the ethics committees of those participating institutions which required their own approval in addition to that of CREBA. The participating institutions included the three nursing colleges noted above, together with academic programs which prepare LPNs, RNs and RPNs. Data from the schools were gathered in four forms: (1) program documentation, (2) faculty interviews, (3) student interviews, and (4) focus group discussions of scenarios involving hypothetical patients.
The research team was led by two researchers with doctorates in education, one with a focus on curriculum studies and qualitative research, the other expert in instructional design and quantitative research. Depth of knowledge in nursing theory and practice was provided by two research assistants, both of whom hold earned doctorates and are knowledgeable about the spectrum of nursing. A team of one researcher and one assistant conducted site visits.

Data were examined qualitatively with a focus on exploring the breadth and depth of knowledge nursing students held, how they thought about themselves on the cusp of becoming credentialed nurses, and how they spoke of going about a particular nursing assignment. The transcripts were coded in two ways: for content knowledge demonstrated and for thinking patterns revealed. In keeping with best practice in qualitative research, the data were triangulated for congruency.

Document comparisons within the study proved more difficult and less useful than anticipated. Scopes of practice and competency statements among the three types of nurse are not organized according to a common framework, and this made comparison difficult. Similarly the surface differences among academic curricula mask what may or may not be real differences in terms of the breadth and depth in which a topic is covered, the level of detail, and the extent to which it is free-standing or connected to other topics.

Some general inferences could be drawn. The mental health emphasis in the RPN program is a key contributor to RPN students’ stronger mental health knowledge. LPN programs focus on giving students a sound foundational grounding in the theory and practice of nursing within the time available. The greater length and breadth of study in RN programs likely contributes to the larger amount of nurse-thinking demonstrated by RN students.

In the interviews, both instructors and students responded to questions which probed understandings of the knowledge bases of other types of nurse in relation to their own; this yielded a sense they partially understood each other and had some common understandings. However there were also some notable differences of perception and a general sense that they were not familiar with each other’s scope of practice.

When the focus group work was analyzed, it became apparent that in the work of the novice nurses in the study there were differences amongst types of nurse in the knowledge and understanding demonstrated. Comparisons between the data gathered in the interviews and the performance in the focus groups revealed both areas of congruence and of incongruence on the part of all three types of nurse. Interestingly, in some cases students demonstrated in the scenarios knowledge that in the interviews they indicated they did not have.

Five large categories proved useful in segmenting the data from the scenarios for analysis:

- Approach -- how students went about the task of preparing a plan of care;
- Thinking patterns – the kind of thinking the students appeared to be doing;
- Understanding the case – how students talked their way through and made sense of the various factors noted about a patient’s condition and their interactive effects;
- Reading lab reports – how students made use of, or struggled to understand, the information coming back from lab tests;
- Actions – what students proposed to do for a particular patient.
The following types of thinking emerged from the data and were applied in the micro-analysis of the scenarios: reading or referring to information given, looking up, recall, nurse-thinking, generative thinking, and speculation. Of the categories listed, “nurse-thinking” warrants explanation in that it was a term coined for a particular phenomenon that was found present in the scenario discussions of each type of nurse. It describes reasoning or responding as a nurse would; drawing upon patient information, learned knowledge and prior experience (whether stated or unstated); and thinking as nurses about the patient’s situation and possibilities. Of particular interest were the conditions under which it appeared and disappeared.

A tentative meta-model for conducting research of this nature was developed in an iterative fashion from the process used to conduct the comparative analysis of the knowledge bases of the three types of nurses. Because such research is exploratory in nature, the meta-model also leans toward qualitative methodology which allows some fluidity in the evolution of the criteria for comparison. Among the issues it addresses is the notion of useful granularity in the level of analysis that is planned and undertaken, and this also needs some degree of fluidity in the implementation of the research. It presents a 7-step general process for conducting research of this nature from which a particular model for any specific set of comparisons can be derived. Particular attention is paid to the development of scenarios for use with focus groups.

The study supports the present wisdom which argues that it is critical to use nurses’ abilities, skills and potential as fully and strategically as possible, and offers a number of observations arising from this work.

Confusion occurs around the use of the term ‘nurse,’ and to which health care workers it properly applies. The issue appears to be reinforced by the existence of three different types of credentials backed by three different knowledge bases, which have amongst them both significantly overlapping and significantly different responsibilities. With regard to the regulatory and practice documents for the three types of nurse, they appear to have been written in isolation from each other, using very different structuring, organization and level of detail, and without any reference to each other’s scope of practice.

It appeared in this study that nurses are being prepared to their scope of practice, and therefore all three should work to their full scope, with the present limits in the scope statements being reasonable in accordance with their nursing education. The study found that significant distinctions among different types of nurse appear to lie partly in major topics studied, but much more in the depth and detail in which topics are studied.

“Nurse-thinking” as a concept appears to be relevant in a variety of ways: (1) in understanding the necessary knowledge base for all nurses and for particular types of nurses, and for clarifying why a knowledge base is not just a list of topics studied or skills learned; (2) in considering implications for the quality of patient care; (3) in considering nursing education; (4) for employment and administration interests; and (5) for further research on its nature and how it can best be fostered. Attention to support for teaching may be a related topic of such an effort. When asked about teaching, instructors often indicated that they had to learn by trial and error how to teach.

Appropriate utilization of nursing professionals is of obvious interest to employers and administrators. It was apparent that individual knowledge and experience matter, so this is not as simple as specifying credentials. Results of the data analysis argue that, for recent
graduates, RPNs are well positioned for mental health work and to some extent beyond that; LPNs are best suited to dealing with stable patients; RNs are prepared to deal with the full range of patient conditions, including critical and rapidly changing patients and case management. This point, frequently made by instructors, was evident in the scenario data which showed that LPNs proposed appropriate actions on basic care but were hesitant or unable to do so with more complex situations, and that RPNs gave appropriate responses to mental illness but were less effective with a medical surgical situation.

The three factors of stability, nursing experience, and system support are each, separately and interactively, vital in staffing decisions. For anyone responsible for deploying nurses, these three areas and their interaction seem absolutely critical.

All three types of nurses engaged to some extent in nurse-thinking, although to varying degrees and depth. It appears that there is a strong relationship among three factors: the foundational knowledge of the nurse, the complexity of the task and the extent of the nurse-thinking. The better the knowledge base, the greater the amount of nurse-thinking; the more complex the task, the greater the nurse-thinking—provided the knowledge held is sufficient; the less knowledge, the more limited the nurse-thinking. Since all three types of nurses displayed this capability, though the amount and degree of sophistication varied considerably, it seems likely that there is a relationship to studying nursing and to how nursing is taught.

Beyond delineating commonalities and differences among the knowledge bases of the three types of nurse which formed the focus of this study, the study developed a way of examining the kinds of thinking which nurses appear to do when considering the care of particular patients. More broadly the study also demonstrated an approach to examining cognitive activities as a dimension of professional knowledge, and it did so through a research model that is transferable to other combinations of professionals. To this end it also developed a tentative meta-model that can provide guidance in developing the methodology to make those future comparisons.
The Knowledge and Education Project (KEP) was undertaken to probe the knowledge bases of three types of nurse in Alberta with a view to understanding more fully how they relate to one another. The three types of nurse involved in the project are Licensed Practical Nurse (LPN), Registered Nurse (RN), and Registered Psychiatric Nurse (RPN), as these three designations are applied in the Health Professions Act of the Province of Alberta. Because there are identifiable "types" within the collective designation of "nurse" there is an underlying assumption that it is possible to differentiate one type from another, not only in terms of what they are expected to do, but also in terms of what they “know” and/or how they can be expected to perform based on what they know. It is important to note that undertaking this research was of more than “academic” interest; health care administrators are having to pay closer attention to appropriate deployment of staff, and it was hoped that findings from this study might provide additional useful information to decision makers. This in turn speaks to the need for research which goes beyond probing what knowledge is held to examining how the knowledge is held and how it is likely to be instantiated.

This report will make frequent reference to the expression knowledge base in an effort to differentiate what an individual nurse might “know” from what might be considered the expected collective knowledge held by a profession, or in the case of the project reported here, by a subset of a profession. Much current use of the expression ties it to artificial intelligence wherein the knowledge base can be manipulated by intelligent software. However, the usage throughout this report is consistent with the classical one that appears in Shank (1982), Groen & Patel (1988), and Reason (1990) to signify an integrated body of knowledge associated with a profession or trade (e.g., medicine, librarianship, carpentry).

Differences in knowledge bases can be conceptualized in a variety of ways, all of which were relevant to the task. Differences may be differences in kind or differences in degree. Differences may be gross differences or subtle differences. One expects in differentiating between health professions that gross differences are probably not problematic. More likely the differences of greater interest belong to the combination of subtle yet profound where, for example, the performance of a task by members of two different professions may appear superficially to be similar or even identical, but how they think about the tasks is different, and that difference can have significant implications for the outcomes of their work.

Differences in kind may have to do with the categories of tasks that are performed by members of different professions. It may also have to do with the underlying principles which organize how that knowledge is held. For example, it is conceivable that one profession might organize its knowledge base procedurally, and the application of those procedures in practice might be a matter of selecting and implementing a correct procedure. Another profession might organize its knowledge base conceptually, and the application of procedures might be subject to a more comprehensive perception of the patient’s situation.

It is also important to note that it is possible to have a difference between the “official” description of what different professions are expected to learn in their academic programs and how the actual learning plays out in practice. The literature on needs assessment and human performance analysis makes a great deal of the distinction between optimals and actuals, between what we intend or want to happen and what actually occurs (Rossett, 1987; Robinson & Robinson, 1995). This phenomenon is similarly reflected in the literature on curriculum (e.g., Goodlad’s distinction, as cited by Farrell, 1991) among:
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- the *ideal curriculum* -- what scholars say should be taught;
- the *formal curriculum* -- what a governing body has mandated;
- the *perceived curriculum* -- what teachers believe they are teaching;
- the *experiential curriculum* -- what students believe they are learning;
- the *operational curriculum* -- what observers see.

The development of a model that can facilitate comparing the knowledge bases of subsets of the health professions is not possible without considering differences of this nature, particularly since the personnel of interest in this study were those about to graduate and enter the profession. It is also worth acknowledging that, since all the professions of interest share some (probably overlapping) common space, one can expect there will be some “fuzziness” in the boundaries which any ensuing model may draw among the various health professions. At the outset of the project it was considered that the probability of establishing that the professions are mutually exclusive as represented by Figure 1 would have been highly unlikely.

**Figure 1**: No overlap among professional knowledge bases

It was considered much more likely that the relationship among knowledge bases might turn out to be overlapping as shown in Figure 2, or even that one professional knowledge base might subsume another (almost) totally, as represented in Figure 3.

**Figure 2**: Partial overlap in knowledge bases.
The following four goals were established to guide the research:

1. To develop a replicable model and tools to analyze and describe educational program content and types and levels of knowledge acquired, across the professions.
2. To use the model and tools to analyze and describe the educational program content and depth and breadth of knowledge across the three nursing groups.
3. To determine the relationship between the information learned and how that can contribute to effective decision-making relative to optimal workforce utilization.
4. If resources permit, to expand the project to incorporate other professional groups.

Across the life of the project, it was necessary to devote all efforts to the first three goals and thus it was not possible to expand the project to other professional groups.

It is clear from the sequence of this original list of goals that there was considerable interest in developing a replicable research methodology or model which would not only enable comparisons among the knowledge bases of the three types of nurse, but which could also be extrapolated to make comparisons between the knowledge bases of various other health care professionals. The guidelines for developing this replicable model are referred to in this report as the *meta-model*. While a discrete process might have been desirable in which construction of the meta-model was completed first and subsequently informed the data-gathering phase of the research, model construction is by nature an iterative process which must routinely check its evolution against the realities of what is being modeled. In effect it is analogous to the practice of rapid prototyping in the world of computer programming. Accordingly, the development of the meta-model took place concurrently with progression of the research project. The meta-model will be described in detail later in this report.

The proposed approach to conducting the research identified five sources of information: (1) academic and professional literature relevant to the knowledge and education of nurses, (2) documents describing the scope of practice and expected competencies of the three nursing bodies and certification examinations, (3) documents pertaining to the academic programs which prepare the three types of nurse, (4) insights into preparation programs provided by program instructors who brought to bear their experiences as nurses and nurse educators, and (5) information provided by student nurses at the point of their induction into nursing, as shown through a series of case-based focus groups and through individual interviews.

On the surface it would appear that accomplishing the task of comparing the knowledge of the impending graduates of three nursing programs should be a rather simple matter of
comparing curriculum documents from the three associated academic programs and/or comparing the official statements of scope of practice for the three. The waters, however, are muddied by several factors: (1) multiple academic programs address the scopes of practice in different ways, (2) the scopes of practice themselves have not been developed with a common language on a common framework, (3) "official" curricula are seen by students through additional lenses imposed by such factors as the teaching format of their program and the nature of their field experiences, and (4) within-group variance of those graduating from the various academic programs can mask between-group differences. One is reminded of Goodlad’s (previously cited) distinctions among perceptions of curriculum. As the research team embarked on the initial phase of document analysis, it became increasingly evident that considerable attention needed to be paid to what Goodlad labeled experiential and operational curricula. Thus, interviews with faculty and students gained paramount importance, as did student focus groups which permitted observation of student application of knowledge to applied problems. More will be said about this in the discussion of the data.

Oversight of the project was performed by a steering committee representing the three nursing governing bodies: Licensed Practical Nurses of Alberta, College of Registered Psychiatric Nurses, and College and Association of Registered Nurses of Alberta, together with representatives from other key bodies associated with the health professions (listed in Appendix A). The project proposal was reviewed by the steering committee, and the committee met regularly with the researchers to review progress and provide direction.

As with most research projects, certain constraints were placed upon gathering data to accommodate time, resources, and institutional sensitivities. In this case the target population of interest was restricted to nursing students about to graduate from their programs—basically a population of novice nurses. The steering committee was sensitive to any misinterpretation that the project might be about evaluating academic programs, and the researchers were careful to maintain a respectful distance from anything that might be construed as evaluative, when approaching the institutions, when interviewing their staff and students, and when reporting findings. Obviously the researchers were also restricted to working with institutions that were willing to participate and share information, and fortunately there was an adequate representation of institutions to satisfy the need for data; the data were gathered in participating schools and generalization should not be made to other programs in the province. Also, it also was judged impractical to try to capture the thought processes of student nurses at work in a hospital setting. Two written cases which student nurses worked through under observation in focus groups represented the closest the project could come to probing student nurses’ application of knowledge in practice.

In the following sections of this report the details of the study are presented. First there is a review of selected literature. The third section describes the methodology which for convenience is reported in a generally linear fashion; however, in reality the process was very much an iterative one which responded to constraints, data and findings as they emerged. Similarly the data interpretation section is organized in the interest of clarity rather than trying to replicate the process through which the data emerged. After addressing the particulars of the present study, the report turns to the goal of producing a meta-model that can inform future research of this nature. The reader is cautioned that the meta-model presented is tentative at this point in that it has been “tested” against a single implementation. Hopefully it will prove useful to other researchers in future studies. The report concludes with a summary of the more salient aspects of the research.
GROUNDING THE STUDY

The review of the literature focuses on the differentiation of nursing roles and available models for differentiating practice roles in the health professions. No models for differentiating roles were found. The literature on differentiating nursing roles, though more fruitful, was not without its limitations.

There are a number of approaches one can take to differentiate professional roles: differences in what professionals are legislated to do, what they are taught and how, and what they do in practice. These approaches served as the basis for the literature search.

As all health care professionals are concerned with the health and well-being of those for whom they care, and in many cases draw on the same bodies of knowledge, it is not surprising there is overlap in their roles. It is also reasonable to assume there are more obvious differences among professions with more dissimilar disciplinary knowledge bases, for example social work and occupational therapy, than groups that draw knowledge from the same disciplinary base as is the case for LPNs, RNs, and RPNs.

Although different types of nursing roles have been in existence since World War II, there has been little done to differentiate the roles of nurses in Canada. In a recent study of LPN, RN, and RPN perceptions of working to full scope of practice, no research comparing these types of nurse was found (Besner et al., 2005). Most efforts to differentiate nursing roles have focused on specialty RN practice (Oelke et al., 2008).

In the United States, efforts to differentiate nursing roles date back to the 1970s when the National League of Nursing and the American Nurses’ Association differentiated the competencies of BN (Baccalaureate Degree in Nursing) and ADN (Associate Degree in Nursing) nurses. In more recent times, US differentiation initiatives such as the Texas Model of Differentiated Entry-Level Competencies of Graduates of Nursing Programs (Poster et al., 2005) have been directed toward workforce planning. Even though these initiatives are American as opposed to Canadian, they were the most informative of the literature reviewed. The consistently used definition of differentiated nursing practice in the American literature is “the practice of structuring nursing roles on the basis of education, experience, and competence” (Boston, as cited in AACN-AONE, 1995, p1).

The importance of differentiating roles is apparent when one considers the negative impact of undifferentiated roles and the benefits that come from differentiation. In nursing, the absence of clearly differentiated roles has led to role confusion (White, et al., 2008), undifferentiated practice roles and subsequently, undifferentiated hiring practices and education programs (Fosbinder, Ashton, & Koerner, 1997; Koener, 1992; Loquist & Bellack, 1999). This leads to nurse dissatisfaction, underutilization of nursing resources, and duplication of effort (Oelke et al., 2008). This in turn impacts recruitment and retention. Lack of clarity on how one professional role differs from and overlaps with other professional roles also impedes interdisciplinary teamwork (Miller, 2004).

The anticipated benefits of differentiated nursing roles include: recognition and reward (AACN-AONE, 1995), clinical laddering (Levi, Montgomery & Hurd, 1994), integrative nursing care systems (Koerner, 1992), and student mobility across levels of nursing programs (Keating & Sargent, 2001). According to AACN-AONE, differentiated practice leads to greater nurse satisfaction as nurses are able to maximize their skills. From an
economic perspective, differentiated roles can lead to cost savings. For example, over a six year period the Sioux Valley Hospital in South Dakota decreased length of stay, readmissions, inpatient days, and intensive care days (AACN-AONE). The hospital has twice been among the 100 Top US Hospitals—Benchmarks for Success with *Modern Healthcare* commending the hospital for its cost savings, citing differentiated practice as the main factor.

This literature review describes approaches to differentiating LPNs, RNs and RPNs that could lead to a better understanding of the differences in knowledge held by each type of nurse and how that knowledge is enacted in practice. The literature is organized in this way: differentiating by scopes of practice and competencies; differentiating by education, and differentiating by the knowledge used in practice.

**Differentiating Nursing Roles Using Scopes of Practice and Competencies**

In this section of the review the challenges uncovered when attempting to compare the scopes of practice and competencies of the three types of nurse in Alberta are described, followed by two resources external to Alberta that provide useful insight into the differentiation of nursing roles: The College of Nurses of Ontario and the differentiated practice initiatives in the United States.

In Alberta the practice of nursing by LPNs, RNs, and RPNs is regulated by the Health Professions Act through the governing colleges of each type of nurse: College of Licensed Practical Nurses of Alberta (CLPNA), College and Association of Registered Nurses of Alberta (CARNA), and College of Registered Psychiatric Nurses of Alberta (CRPNA). Each college is required to regulate its members in ways that protect and serve the public interest. This includes setting entry requirements (including education), specifying services provided, and setting standards of practice. The approach taken by Alberta Health and Wellness is one in which no one profession has exclusive rights to providing services or performing specific skills (Alberta Health and Wellness, 2009). In fulfilling their responsibilities each nursing college has developed information intended to clarify their scope of practice and competencies. It is logical to assume a comparison of practice scopes and competencies would yield useful information about the differences among the three types of nurse. However, the varying approaches taken by each college make comparisons difficult. These challenges are described.

**Challenges in Differentiating Alberta Nurses by Scope of Practice**

White et al. (2008) note that scope of practice is an unstudied concept and health professions have ascribed different meanings to it: standards of practice, competencies, legal basis of practice, and clinical practice parameters. Also, some have taken a broad approach to explaining practice scope while others have taken a more narrow approach. For example, in their joint position statement the Canadian Medical Association, the Canadian Nurses Association, and the Canadian Pharmacists Association (2003) took a broad approach to scope of practice indicating it should entail: accountability, education, competencies and standards, quality assurance and improvement, evidence based practice, legal liability and insurance, regulation, risk assessment, and settings and cultures. In their studies of nurses' perceptions of working to full scope of practice, a collaborative of Canadian nurse researchers took a narrower approach defining scope of practice as “the professional role that is based on the knowledge base of the profession” (Besner et al., 2005, p.22) and the “predetermined expectations of the roles that all nurses are educated and legislated to perform at entry to practice” (Oelke et al., 2008, p.59). The Canadian
Nurses Association (1993) notes that although scope of practice is difficult to define precisely, it is the basis for standards of practice, educational preparation, and job descriptions.

The approaches to describing scope of practice taken by the three nursing colleges are varied. Although each is necessarily based on the legally binding Health Professions Act, the amount and type of elaboration differ. The scope of practice for RNs is a multi-paged document divided into these sections: legislation, and foundations of RN practice which include clinical practice, administration, education, and research (CARNA, 2005). For LPNs the scope of practice is as set out in the Alberta Health Professions Act and further defined by the Competency profile for licensed practical nurses (2nd ed) (2005). The RPN scope of practice is as set out in the Alberta Health Professions Act for Registered Psychiatric and Mental Deficiency Nurses Profession Regulation without further elaboration (CRPNA, 2005). These inconsistent approaches make differentiation by scope of practice unfeasible.

**Challenges in Differentiating Alberta Nurses by Competencies**

Those attempting to compare types of nurse based on competencies have faced similar challenges. Basford (2005) compared competencies of LPNs, RNs, and RPNs. This comparison did not produce a useable description of the commonalities and uniqueness among the three nursing types. Basford cites varying levels of detail, and different language and approaches as reasons for her lack of success. She recommends the development of a laddering or levelling taxonomy that would differentiate the competencies of the three types of nurse. Besner et al. (2005) state that one factor contributing to this problem is the lack of consultation among the three professional colleges.

A review of the competency documents for the three types of nurse in Alberta reinforces the challenges Basford (2005) described. There is little consistency in the way the three have organized their competencies. The RN competencies are divided into 5 categories: professional responsibility and accountability; knowledge-based practice; ethical practice; service to the public, and self-regulation (CARNA, 2006). In addition, the CARNAs competencies document directs readers to the Nursing Interventions Classification (Bulechek, Butcher and McCloskey, 2008) which describes 542 specific nursing interventions used by RNs. There are 24 categories of LPN competencies: nursing knowledge; nursing process; safety; communication and interpersonal skills; nursing practice; competencies for each of 15 areas of nursing (e.g., respiratory care; surgical care; maternal/newborn care; mental health nursing; clinic based nursing); medication administration; infusion therapy; professionalism; and the LPN leadership role (CLPNA, 2005). The RPN competencies are grouped into 8 categories: therapeutic psychiatric nursing practice; theory-based psychiatric nursing practice; application of the nursing process; integration of critical thinking and clinical judgment; psychiatric nursing education; administration; research; and professionalism (Alberta Health and Wellness, 2001).

Additionally, LPN and RPN competencies are described at a more detailed level than the RN competencies. For example, while the LPN and RPN competencies both include wound care, for RNs wound care is one example of the competency: Implements preventive and therapeutic interventions safely.

These three Alberta regulatory bodies have taken what could be considered a first step in differentiating types of nurse in their jointly developed document *Collaborative Nursing Practice in Alberta* (2003). This document describes responsibilities that are shared by all nurses as well as those of each type. The main purpose of the document is to promote appropriate utilization of nursing resources based on client, nurse, and environmental
factors. However, role comparison is limited to identifying situations where LPNs can practice autonomously as opposed to those where RNs or RPNs should also be involved. While this is a start to differentiating nursing roles it does not adequately differentiate the three types of nurse, each of whom is accountable for their own practice.

One cross-disciplinary example of competency comparisons was found, and that is outside of Alberta. Verma, Paterson, and Medves (2006) from the Faculty of Health Sciences at the University of Toronto harmonized core competencies from medicine, nursing, occupational therapy, and physiotherapy. They used the competencies established by the Ontario professional organizations. The competencies were organized under these units: professional, expert, scholar, manager, communicator, and collaborator. While their framework is intended for designing interprofessional education, the authors claim theirs is the only competency model that “defines a set of expected skills both ‘vertically’ and ‘horizontally’ among health care professionals” (p.110).

**Differentiating Nursing Roles in Ontario**

The College of Nurses of Ontario (CNO), the regulatory body for Registered Practical Nurses and Registered Nurses, has a set of materials that help nurses and their employers differentiate these two types of nurse. (Psychiatric nurses are not included in the regulated nursing types in Ontario.) Their model of differentiated practice takes into consideration three factors: the client’s health condition; the nurse’s knowledge, skills, and judgment; and the environment in which the care is given (CNO, 2006). This approach positions role differentiation within the broader context of the health care environment. According to CNO, because their knowledge base has greater breadth and depth, registered nurses care for clients regardless of complexity, while practical nurses, who have less breadth and depth of knowledge, care for clients whose needs are less complex. Client factors that need to be considered are: complexity of care needs, predictability of outcomes, and risks for negative outcomes. Environmental factors include practice supports, consultative resources, and stability and predictability of the environment. The greater the complexity of need, the more unpredictable the outcomes and the greater the risk for a negative outcome, the greater the need for collaboration between registered and practical nurses.

**Differentiating Roles and Competencies in American Nursing Practice Initiatives**

The richest source of evidence-based literature on differentiating nursing practice roles is in the United States where a number of initiatives have led to differentiated practice and education models that specify the roles and competencies, knowledge, and skills of Licensed Practical/Vocational Nurses, Diploma Nurses, Associate Degree Nurses, and Baccalaureate Degree Nurses. In the United States Licensed Practical/Vocational Nurses graduate from a one year program in a technical or vocational school or college; Diploma Nurses graduate from a 3 year program in a hospital; Associate Degree Nurses graduate from a 2 year program in a college; and Baccalaureate Degree Nurses graduate from a 4 year program in a university or college. An example of role differentiation is provided, followed by one example of competency differentiation.

In the early 1990s the American Association of Colleges of Nursing (AACN) and the American Organization of Nurse Executives (AONE) formed a task force to develop, among other things, a model of differentiated practice and education for Associate, Baccalaureate, and Master’s degree nursing education (ACCN-AONE, 1995). The task force included representatives from education programs, hospitals, and community and long term care organizations. Building on role differentiation experiences in earlier initiatives (the Colorado
Differentiated Practice Model [Levi, Montgomery, & Hurd, 1994], the Midwest Alliance in Nursing [Koener, 1992; Primm, 1987], and the National Healing Web Partnership [Fosbinder, Aston, & Koerner, 1997]) they developed a model based on core and unique values, and the concepts of time frame (shift vs. life span), motion (capacity to integrate), and space (unit vs. community). These concepts became the basis of role descriptions, as well as competencies. Table 1 is a role description example that differentiates Associate Degree Nurses and Baccalaureate Degree Nurses based on the clients for whom they care and their role in research.

Table 1: Role description examples: Two types of nurse in the United States

<table>
<thead>
<tr>
<th></th>
<th>Associate Degree Nurses</th>
<th>Baccalaureate Degree Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clients</strong></td>
<td>Focus on individual clients who have common, well-defined nursing diagnoses.</td>
<td>Focus on clients with complex interactions of nursing diagnoses.</td>
</tr>
<tr>
<td><strong>Research</strong></td>
<td>Recognize that nursing research influences nursing practice and assist in standardized data collection.</td>
<td>Collaborate with nurse researchers and incorporate research findings into nursing practice.</td>
</tr>
</tbody>
</table>

Source: Primm, 1987

Role descriptions leading to general differentiated competency statements were developed, followed by differentiated competencies in three areas: direct care provision, communication and management (Primm, 1987). Here are sample care provision competencies for Associate Degree, Baccalaureate Degree, and Masters Degree nurses from the Sioux Valley Hospital project (Koerner, 1992):

- **Associate Degree Nurses**: Monitor and evaluate immediate patient response to nursing and medical treatments
- **Baccalaureate Degree Nurses**: Monitor, evaluate, and trend patient responses to nursing and medical treatments over hospital stay
- **Masters Degree Nurses**: Analyze delivery systems and client care through the use of theoretical frameworks to promote the delivery of holistic care

The competencies for Associate Degree Nurses are assumed in those of Baccalaureate Degree Nurses, and the competencies for Masters Degree Nurses include those from both Associate and Baccalaureate Degree Nurses.

In summary, there is a paucity of evidence-based knowledge in the literature for comparing the three types of nurse in Alberta. Also, because the three types of nurse have taken such different approaches to describing their scopes of practice and competencies, comparisons that could lead to differentiation are problematic.

While role description and competencies may differ in Alberta, the nursing role differentiation projects in the United States provide useful insight into how different types of nurse can be compared. They also appear to explicate differences in role breadth and depth. The one common thread across these initiatives appears to be the willingness of all stakeholders to step outside their current situation, and using a consensus approach, collaborate in the development of differentiated roles, and competencies. While these initiatives are not likely directly transferable to the Canadian context, their processes and products would appear to be a good starting place for comparing types of nurse in Alberta. Closer to home, the CNO
work on differentiating registered nurse and registered practical nurse roles warrants attention. Their three factor model takes into account client needs and the care environment as well as the nurse’s knowledge and skills. Further, it is noteworthy that the colleges representing the three types of nurse have taken a first step in differentiating roles; further work in that regard seems advisable.

**Differentiating by Education**

Another approach to differentiating types of nurse is to compare educational preparation. Program comparisons were found in the American differentiated nursing practice projects, as well as one in post-secondary education, and another in the clinical laboratory field. Some of the American initiatives also compared education by competency level and one used their differentiated competencies to identify differentiated teaching strategies. Program, competency, and teaching strategy differentiations are described.

**Differentiating Education at the Program Level**

Loquist and Bellack (1999) claim the outcomes of the different levels of nursing programs have become blurred. In their view this is due to the undifferentiated agency hiring practices which led educators to expand program content to meet employer needs. As part of the South Carolina Colleagues in Caring project, a framework for differentiating entry level programs by type (Practical, Associate Degree, Baccalaureate Degree, and Masters Degree) was developed (Loquist & Bellack). The framework categories are: seven dimensions of practice (average program length; mission/purpose; focus; clients; time frame; setting; and the capacity to integrate); and selected demonstrated skills (nursing process, technical, communication, management/leadership/ administrative, and health promotion/maintenance/patient education).

In post-secondary education, Stark, Lowther, Hagerty and Orczyk (1986) created a conceptual framework for colleges and universities to use in comparing entry level professional education programs. They believed a guiding framework was necessary to ensure systematic and objective program comparisons. Their framework has five properties: 1) categories that detect the emphasis and processes across all programs; 2) mechanisms to detect internal and external influences over time; 3) broadly stated constructs that allow for comparisons; 4) broad language that allows for cross-program recognition and student attainment of competencies; and 5) a pre-service rather than a professional development focus. The authors describe a comprehensive grounded theory approach to developing the framework. The first element of the framework is the professional preparation environment which is impacted by external influences (e.g., labour market, external licensing standards); intra-organizational influences (e.g., budgets, program centrality); and internal influences (e.g., knowledge base, students, curriculum tensions, control over practice settings). The second element is educational processes which include program objectives, curriculum design, teaching methodologies, and evaluation procedures. Stark et al. describe these educational processes as the dependent variables of the first element (the professional preparation environment), and the independent variables in relation to outcomes, the third element of their model. This third element is professional competence which includes a range of competency categories and professional attitudes. Stark et al. claim their framework can be used, among other purposes, to develop comparative program profiles within a discipline or across disciplines. This framework appears to provide a reasonably broad approach for comparing professional education programs.
The American clinical laboratory profession has differentiated the roles of lab personnel. Their taskforce of educators and managers faced issues similar to nursing, for example lack of well-defined practice roles and job descriptions, and limited mobility between levels of practice (White Paper, 2007). Using a process called the 6 Sigma/DMAIC (Define, Measure, Analyze, Implement and Control) they designed a model that differentiates levels of practice based on education, certification and experience. Their model is based on seven pre-defined levels of practice, each with a set of laboratory skills. The expected education, experience, and certification for each level are specified. When used as a guide to curriculum development this model results in more effective use of teaching time, allowing educators to focus on essentials for their particular laboratory group (White Paper).

**Differentiating Education at the Competency Level**

The Texas differentiated role project (Poster, 2004; Poster et al., 2005) developed the knowledge, the clinical behaviours and judgments needed for each levelled competency. These have been integrated into Texas nursing curricula (Poster). (Poster notes other states that have used differentiated competencies in education as well as in practice: Indiana, Nebraska, New Mexico, Colorado, and North and South Dakota.) As with the competencies (Table 1), the knowledge and skills for the first level are assumed in those of the next level. Table 2 is an example of the differentiated knowledge and clinical behaviours/judgments for one differentiated competency (problem solving/critical thinking) for Vocational Nurses, Diploma/Associate Degree Nurses, and Baccalaureate Degree Nurses. The developmental nature of knowledge and skills is evident across the three nursing groups.

**Table 2: Differentiated knowledge and skills: Problem solving/critical thinking**

<table>
<thead>
<tr>
<th>Competency</th>
<th>Licensed Practical / Vocational Nurses</th>
<th>Diploma/Associate Degree Nurses</th>
<th>Baccalaureate Degree Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use a problem solving approach</td>
<td>Use a critical thinking approach to analyze clinical data and current literature as a basis for decision making in nursing practice</td>
<td>Use an evidence based analytical approach as the basis for decision making in practice</td>
<td></td>
</tr>
<tr>
<td>Use a problem solving approach to make decisions regarding care of assigned clients</td>
<td>Additional Knowledge A conceptual framework of nursing practice as a means of planning care and solving clinical problems</td>
<td>Additional Knowledge Nursing framework, theories, and models that relate to managing health care delivery</td>
<td></td>
</tr>
<tr>
<td>A systematic problem-solving process</td>
<td>Additional Clinical Behavior/Judgments Use critical thinking as a basis for decision making in practice</td>
<td>Additional Clinical Behavior/Judgments Use systematic approaches for decision making, including nursing, epidemiological research, political, social, and legal processes</td>
<td></td>
</tr>
</tbody>
</table>

Source: Poster, 2004
Differentiating Education by Teaching Strategies

When competencies have been differentiated across the nursing types, and differentiated knowledge and skills are specified, the next logical step is differentiated teaching strategies, that is, suiting the method of teaching to the content and the students in such a way that the students may learn the content most effectively. The extent to which teaching strategies are differentiated will be impacted by the preparation and experience of the instructors. However, while the literature on teaching nursing is extensive, little attention has been paid to how particular teaching strategies impact how different types of nurse enact their roles.

In summary, although the literature on comparing education programs is limited, program and competency comparisons in the American role differentiation initiatives provide some insight into best practices for making these comparisons. The limited attention to differentiated teaching strategies suggests there is likely much to be learned about how such strategies impact role enactment.

Differentiating by the Knowledge Used in Practice

An alternate approach to differentiating types of nurse, one that gets at the heart of the matter, is to examine the knowledge each type of nurse holds on graduation and how that informs practice. In order to practice well nurses require both theoretical knowledge (know-what) and practical knowledge (know-how). A competent graduate is one who uses both types of knowledge in an artful way to meet the needs of patients. Along those same lines, Pender and de Looy (2004) describe the competent professional as one who uses knowledge to solve real-life problems (a cognitive function); uses assessment data in clinical reasoning (an integrative function); works effectively with clients and others (a relational function); and uses these skills judiciously and humanely (an affective/moral function).

Using knowledge in practice is often referred to as decision making, which according to Bersky, Krawczak, and Kumar (1998) is the “appropriate and timely sequencing of nursing actions taken with, or on behalf of, the client” (p.22). Grossman (1996) describes decisions as: “….judgments made by the nurse directed towards assisting the client through a problem-solving process to promote, maintain, or regain health” (p.1). In other words, the process leads to a conclusion and a resulting action. Decision-making includes these steps: 1) defining the situation, 2) assessing needs, 3) prioritizing needs, 4) planning the interventions, 5) carrying out the interventions, 6) and evaluating the results (Lauri, 1992).

Because RN education is considerably longer than LPN and RPN education, and the focus of RPN education differs from the other types, one would expect differences in how the three go about decision-making, what they assess (including what is emphasized), the specific interventions they plan and implement (including referral to other team members), and the results they evaluate. The challenge is how to tease these apart given role overlap and the fact that the three types of nurse share the same disciplinary knowledge base.

There are two overarching approaches to learning about knowledge used in practice: real-life clinical experiences, and simulations that imitate the real thing. From an educational perspective the clinical setting has been the accepted (and preferred) standard for measuring clinical competence, including problem-solving and decision-making. In recent times, health care restructuring, increasing patient acuity, and staffing shortages have led nurse educators to rely more heavily on simulated experiences for both learning and assessment. These simulations have been fuelled by recent technological advances. The
potential contribution of these approaches (real-life experiences and simulations) to understanding how the three types of nurse use their knowledge in practice is described.

**Real-life Clinical Situations to Understand Knowledge used in Practice**

The most realistic way to find out how nurses enact their knowledge is in the real world of clinical practice. It is here that nurses put their theoretical and practical knowledge to use. A research approach is through direct observation combined with debriefing sessions. However, the unpredictable nature of events in the clinical environment, as well as restrictions placed on students’ practice, often limit what can be learned. Also, the job descriptions do not always reflect the full scope of practice for which nurses are prepared. Direct observation is also costly and the uncontrollable nature of clinical work can impede data collection.

Observing nurses as they practice shows the results of thinking, not the thinking process per se. The think aloud method of data collection used in qualitative research and as a teaching and learning strategy (Banning, 2008) is one way to get at cognitive processes. This entails people talking aloud as they problem solve, usually into a tape recorder through a portable microphone (Aitken & Mardegan, 2000; van Someren, Barnard, & Sandberg, 1994). This strategy allows for the assessment of the decision-making process as well as the outcome (van Someren et al.). Aitken and Mardegan, and Fonteyn and Fisher (1995) used this approach in the clinical setting and claim the nurses’ continual talking did not cause undue distress for either staff or patients, and patient care was not compromised. They do point out the challenges of transcribing audiotapes that contain a lot of background noise. While concurrent verbal reports are considered to be more valid (Aitken & Mardegan), Fonteyn and Fisher note retrospective verbal reports allow the researcher to delve further into participants’ thinking. Both Aitken and Mardegan, and Fonteyn and Fisher believe this approach is superior to using simulations. A particularly effective approach is to combine think aloud recording with later debriefing in which the participant comments on his/her own recorded statements.

**Simulations to Understand Knowledge used in Practice**

Simulations, strategies or systems that mirror, imitate, or re-enact real situations (Li, 2007; Ravert, 2004) overcome some of the challenges inherent in learning about nurses’ knowledge in actual clinical settings. They allow students to make independent decisions (Li), and they ensure targeted and sometimes otherwise unattainable experiences can be assessed (Li; Ravert). Simulations are appropriate for assessing clinical judgment as they mimic real life situations and they do not threaten patient safety (Grossman, 1996). They can measure more than one level of knowledge and are performance-based (Li). One of their drawbacks is that they lack realism, particularly with respect to patient responses (Ravert). Also, because they are less complex and more predictable than the clinical area, some thought processes that occur in clinical environments may remain undiscovered (Fonteyn & Fisher, 1995). Li also notes students do not always take simulations seriously.

While technological advances have fuelled the development of sophisticated simulations such as human patient simulators (computerized manikins that simulate physiological processes and reactions) and computer-based simulations, low technological simulations are also used, for example, pen and paper progressive case scenarios, or standardized patients (actors playing patient roles). Pen and paper simulations were used to assess clinical judgment in medical education as early as the 1960s (Grossman, 1996; Lauri, 1992;
Wong, Wong & Richard, 1992). Based on learner needs, positive reviews by learners and instructors, along with resource issues, their use has continued to grow.

Whether low tech or high tech, well developed cases appear to be the backbone of good simulations. Kim et al. (2006) synthesized the literature across disciplines and identified these core case attributes: relevance to level of learner, the educational goals, and the context; realistic relevant and non-relevant content that is progressively disclosed; engaging content that is rich with multiple perspectives and decision-making opportunities; and challenging levels of difficulty. Such cases are often described as having high fidelity – they imitate reality to a high degree (McCallum, 2007; Ravert, 2004). Grossman (1996) describes these characteristics of high fidelity simulations: information is presented in a way that closely resembles the real situation (e.g., how patients explain their symptoms as opposed to how they are described in a text book); they include a series of decisions that are sequential and interdependent; they have realistic results; there is no opportunity to retract an ineffective or harmful decision; and students must deal with the consequences of poor decisions. Extensive work is required to develop cases that meet these requirements. They also require faculty members to be skilled facilitators.

Some of these attributes are reflected in Gilboy and Kane’s (2004) ‘unfolding case-based scenarios’ for newly licensed nurses working on an emergency unit. Their pen and paper cases had up to 25 unfolding steps that realistically depicted how patient situations develop. The nurse educator presented a description of a patient situation and then asked one or two questions, followed by more information and more questions, until the case was complete. Debriefing sessions focused on the nurses’ thought processes. Chard (1998) also used pen and paper scenarios to assess age-specific competencies in RNs, surgical technologists, and OR assistants. Staff also developed care plans for the patients. Chard reports this assessment demonstrated the staffs’ critical thinking and judgement skills.

According to Johannsson and Wertenberger (1996), pen and paper scenarios are the most commonly used approach to assessing critical thinking, probably because they are quite easy to administer and their resource requirements are low. Their main drawbacks are that they do not address the complexities of clinical decision-making (Johannsson & Wertenberger), nor do they allow students to continue down a wrong path where they are forced to deal with the consequences of poor decisions (Gilboy & Kane, 2004).

In their pilot study on the effectiveness of simulations for testing critical thinking, Johannsson and Wertenberger (1996) combined pen and paper tests with four-minute videotaped vignettes. The vignettes were from the Performance Based Development System (PBDS), a tool used in American hospitals for assessing health professional competence (Performance Management Service, 2007). The PBDS assesses critical thinking, including problem identification, risk and problem management, priority setting, and application of knowledge. The students in Johannsson and Wertenberger’s study viewed videos of varying complexity and difficulty. The pen and paper test (referred to as a “What if” exercise) assessed prioritizing, as well as when it was appropriate to take action or to refer. Debriefing sessions were held with each student, reviewing test scores and students’ perceptions of the experience. Johannsson and Wertenberger found that while students were able to identify problems, they did not necessarily know what to do about them. In the interviews, students reported difficulty identifying the most important interventions, for example, they did not consider patient teaching to be a priority intervention. They also considered some interventions to be too obvious to report, for example, reporting to the nurse or doctor. Johannsson and Wergenberger concluded that using video vignettes followed by pen and
paper assessments is an effective way to assess critical thinking. They found the interviews helpful in understanding inferences, abstractions, and generalizations.

Peabody et al. (2004) developed clinical vignettes to assess physicians’ ability to evaluate, diagnose, and treat medical conditions. They then carried out a large study to establish validity of the vignettes against the ‘gold standard’ in simulations: standardized patients. Their results showed that when compared to the medical records generated for the standardized patients, the vignettes were a better measure of clinical care. They dismiss the argument that vignettes only assess knowledge, claiming their study shows they also assess what physicians do in real patient encounters.

Another way to learn about nurses’ knowledge and how they enact that knowledge in practice is in a lab situation. Here simulations can range from role playing (van Eerden, 2001), to Objective Structure Clinical Examination (OSCE) using standardized patients (Jain et al., 1997; Jeffries et al., 2007; Peitzman, 2000; Pender & de Looy, 2004; Rentschler, Eaton, Cappiello, McNally, & McWilliam, 2007; Rushforth, 2007), to Human Patient Simulators – HPS (Radhakrishnan, Roche & Cunningham, 2007; Ravert, 2004).

Van Eerden (2001) created critical thinking vignettes that were integrated into students’ skill assessment labs. The vignettes were designed to realistically portray clinical situations. Faculty or other students played the patient roles, and faculty assessed these areas of student performance: skills, including communication; patient teaching; the care environment; referral and collaboration; management; and critical thinking.

The Objective Structured Clinical Examination (OSCE) is another way to learn about knowledge held by nurses in their practice. OSCE was developed to assess both know-what and know-how knowledge (Austin, Gregory, & Tabak, 2006) in a lab setting. It is used widely in health care education programs including medicine (Jain et al., 1007; Jeffries et al., 2007; Peitzman, 2000), nursing (Rentschler, Eaton, Cappiello, McNally, & McWilliam, 2007), pharmacy (Austin, Gregory, & Talbek, 2006), dietetics (Pender & de Looy, 2004), and international nursing education (S. Goodman, personal communication, November 28, 2007).

OSCE is considered a reliable and valid approach to measuring clinical skills (Jain et al.; Jeffries et al., 2007; McCallum, 2007; Pender & de Looy, 2004; Rentschler, Eaton, Cappiello, McNally, & McWilliam, 2007) including knowledge synthesis, assessment, and problem solving (Jain et al.; Jeffries et al.; Rentschler et al.). Some of the drawbacks of OSCE are: it is resource intensive to develop and implement (Jain et al.; Peitzman, 2000; Rentschler et al.; Rushforth, 2007); and it can be stressful for students (Rushforth).

Finally, computer-based simulations can be used to learn about the knowledge nurses use in practice. They overcome some of the limitations of pen and paper assessments, in particular their inability to address the complexity of decision-making. They are used extensively in medical education, as well as in nursing and other health professions. Computer-based simulations allow students to make independent decisions about patient situations that include interactions among several problems (Bersky, Krawczak, & Kumar, 1998). They allow students to demonstrate their problem solving skills in an environment that does not threaten patient safety (Grossman, 1996). According to Li (2007), computer simulations also offer flexible and unlimited access, and they are relatively low in cost. Their drawbacks include low fidelity and no physical interactivity (Li). While computer simulations are time intensive to develop (Bersky et al.), a number of commercial products are available.
Lauri (1992) notes one of the drawbacks of computer simulations is they do not reveal why nurses made the choices that they did. To address this, Lauri recommended adding a debriefing component using the thinking aloud protocol.

In summary, when it comes to differentiating knowledge used in practice a combination of strategies that get at thinking processes as well as outcomes may be the most effective way to come to understand the knowledge types of nurse hold and use in practice. There is promise in the thinking aloud approach whether it is done in the clinical setting or in combination with simulated experiences. It also appears that either low tech or high tech simulations could be used. Pen and paper simulations accompanied by other strategies such as video vignettes, or debriefing sessions appear promising.

**Conclusion**

This review suggests that differentiating types of nurse by the knowledge they use in practice is superior to differentiating by scopes of practices, competencies, or education. While direct clinical observation is not very feasible, a combination of simulation strategies (low tech as well as high tech) has the potential to uncover differences among LPNs, RNs, and RPNs. However, the issues surrounding differentiating by scopes of practice, competencies, and education should not be ignored. The three types of nurse would need to work together to differentiate their roles and develop strategies for communicating those differences to others. The American differentiated nursing practice initiatives and the role differentiation work done by the College of Nurses of Ontario offer good starting places.
FRAMING THE TASK

The methodology applied in this study was informed by the principles of qualitative research and the concept of congruence. Qualitative methodology avoids imposing predetermined categories upon the data and allows for the emergence of: the actual underlying nature of the data, the nuances of the language used by participants, appropriate triangulation, and the essential characteristics of the meta-model.

This project was fraught with sensitivities driven by the concern each college has for the opportunities and responsibilities its nurses are allowed. This situation challenged the researchers and made it even more imperative than is usual in research to critically attend to the efficacy of the methodology implemented. The research team was led by two researchers with doctorates in education, one with a focus on curriculum studies and qualitative research, the other expert in instructional design and quantitative research. Depth of knowledge in nursing theory and practice was also required on the research team and was provided by two research assistants in turn; when one was no longer available, the other replaced her. Both hold earned doctorates and are knowledgeable about the spectrum of nursing. The focus on efficacy was instantiated in multiple traverses of the data and continuous cross checking to ensure the most rigorous interpretation possible.

Preliminary Considerations

The study was guided by the assumption that for each type of nurse there ought to be a "chain of congruence" leading from the legislation authorizing the existence of the type of nurse, through its scope of practice and competency statements, then to the curriculum documents which guide the academic programs and finally into the knowledge of the student nurses (see figure 4). By implication if each item is congruent with the item preceding it, then one should be able to infer that the knowledge of student nurses is congruent with the legislation. While interpretations will necessarily occur along this chain, as new documents are prepared, details are fleshed out, and ideas are learned, it is nevertheless the case that core concepts should easily be identifiable at each stage making a chain of congruence.

Figure 4: Chain of congruence

![Chain of congruence diagram](image-url)
It was further assumed that in a similar fashion to exploring congruence within each type of nurse, it would be possible to explore congruence between types of nurse, thereby producing a comparative analysis (see figure 5).

Figure 5: Comparison between types of nurse

Two factors which can also exert considerable influence on a study of this nature are the actual availability of data that will permit following the threads of congruence (or lack thereof) and the granularity of the data. There are multiple reasons why desired data might not be available including the impracticality of gathering it, issues associated with ethics, and undesirable consequences outside the parameters of the study. In the case of the present study it would have been desirable to gather data on student nurses’ application of knowledge in their field placements but this was judged impractical. Similarly it would have been desirable to analyze the actual certification examinations given to student nurses, but for those to have been made available to the researchers would have breached the security with which the professional associations surround their examinations.

The term granularity appears in literature related to physics, molecular dynamics, computing, portfolio management, and business, and describes the extent to which a larger entity is broken down into smaller parts (see, for example, Balatsouckas, Morris & O’Brien, 2008). In the case of studies such as the one reported here, granularity has to do with the “coarseness” or “fineness” of the data being examined, and the challenge for researchers is to select a level of granularity which actually yields useful information. In the case of a comparative analysis of curricula, limiting oneself to lists of course titles and topics is apt to be too coarse a granularity because it risks communicating false information based on assumptions about the actual content. Conversely, while there is a temptation to assume that “finer is better”, such is not always the case, and minute disaggregation could potentially yield no additional useful information.

Site Selection

Before initiating the data gathering phase of the study, a request for ethics approval was submitted to the Community Research Ethics Board of Alberta (CREBA); this approval was granted (see Appendix B). Some institutions that agreed to participate in the study required
that ethics proposals also be submitted to their respective ethics boards and this was done. In other cases the institutions were willing to accept the approval of the CREBA. Institutions assisting with the study included the three nursing colleges, plus schools which offer nursing programs: four which prepare RNs, two sites offering the RPN program, and three LPN programs. In the case of one LPN program, access was provided to faculty members but no students were available.

One is always concerned about adequate representation in a data set. It could be argued, for example that a disproportionately small number of RN schools participated compared to LPN and RPN schools when one compares the total number of RN students across all programs in the province to the total number of the other two types of nursing students. Conversely one could argue that a disproportionately larger number of RPN student nurses participated. What was important was to sample the within-program variance across the programs which exist in Alberta and insure the participation of information-rich informants. For reasons of confidentiality the programs that participated cannot be named here, but if one were to examine the list one would note a mix of northern and southern, rural and urban, independent and affiliated, as well as diversity in curriculum organization and instructional methodology.

Written requests for such documents as scopes of practice and curriculum documents were submitted to the Colleges and Schools of Nursing. Interviews and focus groups were kept consistent with what students had come to expect within their programs; that is, where instruction took place in a face-to-face setting, the interviews and focus groups were held face-to-face. In the program in which distance education was the normal format, the interviews and focus groups took place by telephone and video conference respectively. Warrant for accepting the legitimacy of this approach is well documented in the education literature (DeBourgh, 2003; Killarney Theroux, Solej, Bisson, Hay, & Boyer 2004; Ertl, Kopp & Mandl, 2006; also by Crichton, a well respected authority on distance education at the University of Calgary, personal communication).

**Process for Gathering Data**

Upon project receipt of ethics clearance, the Colleges were approached to solicit documents pertaining to scope of practice and professional competencies. These documents provided background for comparisons of the knowledge base of graduating nurses giving, as they do, official statements on what each type of nurse is expected to be able to do and is limited to doing. However, it should be noted that the three sets appear to have been written in isolation from each other and are different in structure, organization and amount of detail, making comparison very challenging. Two other desirable sources of data that could not be accessed were the certification examinations for each type of nurse and observation of clinical experiences—either direct or simulated. The latter has been discussed in the literature review and its potential significance identified there. The certification examinations are indicators of expected baseline knowledge. While blueprints for the certification examinations were made available to the researchers, these did not provide the level of detail that was desired.

The schools were contacted to organize site visits (with the exception of the one program for which videoconferencing was employed). Data from the schools were gathered in four forms: (1) program documentation, (2) faculty interviews, (3) student interviews, and (4) focus group discussions of two scenarios involving hypothetical patients. Participating educational institutions were asked to provide information on their education programs, such
as the goals and objectives of the program, selected course outlines, and any other program directives the administrators deemed significant. (Usually this took the form of student handbooks.) Preferred teaching approaches were discussed in the faculty interviews.

A team of two researchers conducted each site visit, one a qualified nurse, and the other familiar with curriculum theories and teaching methodologies. Both held doctorates and had research experience. This allowed for assimilating a variety of details and information, and double checking understandings and comparing notes during debriefing. During the focus group sessions, the curriculum scholar chaired each session and responded to any student questions, while the nurse educator observed carefully and took field notes. As much as possible both researchers observed carefully how each group of students went about the task of dealing with the cases to learn their problem solving strategies, what factors they emphasized, the apparent depth of their understanding of the issue, and their judgments about when it was appropriate to call in someone with more expertise. The discussions were audio recorded and a transcriptionist subsequently transcribed them.

Interviews were conducted with administrators and instructors to gain a sense of the focus of the program, the teaching approaches used, and the knowledge and skills emphasized. Each participating school was asked to provide five faculty members for interview: the director of the program, the chair of the curriculum committee or equivalent position, a clinical supervisor, and two instructors. Interviews, with both students and faculty, were semi-structured and were audio recorded.

Student volunteers participated in two ways. Each school was asked to give information about the project to those students close to graduation, to invite their participation and to provide eight to ten students for individual interviews and another ten to take part in the scenario discussion (five students per scenario). While the request was that these be different students, so that each student would participate only once (in a interview, in discussion of Scenario A or of Scenario B), some schools did not have sufficient volunteers for that, so that on occasion a student participated in both an interview and a focus group. No student participated in more than one focus group.

Student interviews included three types of questions: (1) those which probed self perception of areas in which they felt most confident and least confident, familiarity with their scope of practice and what it meant to them as they thought about starting their own practice; (2) those which dealt with their understanding of working with other types of nurse or other health care workers; and (3) two questions which probed knowledge, asking them what care they would give immediately to a particular patient and what priority assessments they would first make for another patient.

In preparation for data gathering, an expert team was assembled to construct a scenario that would be appropriate for use with the focus groups. To ensure that the scenario gave each type of student nurse the opportunity to demonstrate fairly the knowledge held, each of the three colleges named a representative who participated in the scenario construction. The effort resulted in the development of a scenario (referred to in this document as Scenario A), which focused on an elderly male patient with a number of health concerns, including diabetes, a history of a stroke, and prostate issues. The efficacy of this scenario as a data generating device was field tested with nursing students in Manitoba in an effort not to contaminate its use in Alberta. Also each representative of the Colleges indicated that her type of nurse ought to be well able to prepare a plan of care for the constructed patient. That proved to be the case, first in the pilot test with students outside the province and then as
used in the study itself. Each student group undertook and completed the task, and produced a plan of care with varying degrees of competence and completeness.

After consideration of the data gathered at the first site, it appeared that this process was working well, but that it would be helpful to have a second scenario with a patient who had different issues, thus drawing upon quite different nursing knowledge and giving a wider picture of what knowledge student nurses held. In response Scenario B was created, focused on a young adult male with schizophrenia who was admitted to hospital following a critical incident which occurred because of his mental illness but who also presented with physical injuries. This second scenario was developed under the leadership of a well experienced psychiatric nurse educator, and again was given face validation by a representative from each of the three nursing colleges.

Both scenarios were used at each site where student data were gathered; no student participated in more than one scenario.

To triangulate more fully what students reported as their strengths, and what knowledge they demonstrated when asked to prepare a plan of care for a hypothetical patient, a third step of observing them at work during a preceptorship and seeing what knowledge they applied in practice would have been needed. However, as the literature review indicates, direct clinical observation is problematic, and although alternatives of simulation and think-aloud protocols were proposed, the Steering Committee opted not to include this aspect.

**Interpreting the Data**

Data were examined qualitatively with a focus on exploring the breadth and depth of knowledge nursing students held, how they thought about themselves on the cusp of becoming credentialed nurses, and how they spoke of going about a particular nursing assignment. Each scenario transcript was examined and coded separately in two ways: for thinking patterns and for the content knowledge (including errors or omissions) displayed in preparing a particular plan of care; interview data were clustered into charts according to topics discussed. Consistent with qualitative methodology, data gathered in the focus groups were triangulated with data gathered in the interviews.

**Figure 6: “Flow” within the approach to comparing dyads**

[Diagram showing the process of selecting dyads, developing specific models, comparing first dyads, and then developing triad models with comparisons within the triad.]
To organize the task of making sense of the data, analysis began with a first round of examining data for each type of nurse, then comparative analysis proceeded by dyads as indicated in Figure 6, rather than attempting to work with all three groups at once. The charts and notes resulting from the initial working through of data were compared first within and then across types of nurse. These analyses fed into an accumulating comparison of the knowledge base of all three types of nurse. Such an approach was useful for each kind of data, but was particularly necessary in the first two rounds of analysis of the scenario data which because of the length of the transcripts required systematic organization. This approach also made possible the opportunity to make iterative refinements to the methodology. As each phase was compared, the dyads were accumulated, so that more data could be incorporated.

Information which schools provided about their programs, the responses to several questions in the faculty interviews, and observations made on site became the basis for comparisons amongst the three types of nursing programs, particularly where they showed which topics are studied and the program structure insofar as that could be determined. Limited program data were gathered, mostly information already in the public domain. Comparisons of programs for the same type of nurse (e.g., comparison of one RN program with another) were outside the scope of this research; therefore, classes and teaching were not observed and specific teaching materials were not examined.

Faculty interviews were considered in two clusters: those questions which asked about teaching methodologies and program, and those focused on comparisons of the three types of nurse. The final question was simply, “Is there anything else you’d like to add?” Student interviews likewise clustered naturally into three categories: (1) those dealing with self-perception of themselves as nurses, (2) those asking about working with other nurses, and (3) two questions which asked about the immediate care they would give to a hypothetical patient.

The focus groups for students were each organized around one of two scenarios which required that students collectively prepare a plan of care for the patient described in the scenario. The transcripts were coded in two ways: for content knowledge demonstrated and for thinking patterns revealed. The transcripts were first segmented into the topics students addressed in their discussion which indicated the breadth of the discussion. The categorization scheme based upon knowledge structures identified by Reigeluth (1983) and alluded to in the proposal failed to yield useful comparisons. This was dropped in favour of a scheme which actually emerged from the data and considered (1) cognitive activities, (2) content assessment, and (3) proposed actions. Analysis was tempered by what appeared reasonable expectations for a novice.

The following types of cognitive activities emerged from the data:

- **Reading or referring to information given** – Students were either reading or restating information given in the scenario. The information cited may or may not have been pertinent to the issue under consideration.
- **Looking up** – Students were reading information from a drug resource.
- **Recall** – Something in the present context (the scenario or the discussion) triggered a memory of prior learning which the student stated and which might be applied to the situation. Recall was sometimes a statement about information previously learned or an example drawn from previous experience.
• **Nurse-thinking** – Students were reasoning or responding as nurses would, drawing upon patient information, learned knowledge and prior experience (whether stated or unstated) and thinking as nurses about the patient’s situation and possibilities.

• **Generative thinking** – Students named a practical action to be taken based on a patient’s condition. Preparing a plan of care included the expectation that appropriate nursing actions (what a nurse does to, for, or with a patient) would be named, and the direct actions indicated in the care plan were included in this category.

• **Speculation** – Students wondered about possibilities not grounded in data, for example, “What if…?” “Could it be that…?” Speculations ranged from very logical inferences to completely ungrounded “wild” guesses.

Of the types of cognitive activities listed above, most are “everyday terms” and are intuitively obvious when analyzing the transcripts. The exception is “nurse thinking,” a term devised by the researchers to identify a pattern of thought which was different in kind from the others identified and which was drawn upon to different degrees by different participants in the study. It was a pattern of thought which seemed highly specific to the profession. “Nurse thinking” can be argued to draw upon a short but rich history of investigation into the thought processes of professionals. Behind it are three bodies of literature: reflective practitioner (Schön, 1983), teacher thinking (Clark & Peterson, 1986; Clark & Lampert, 1986; Roberts, 1991), and reflective expertise and schema theory (van Merriënboer, 1997).

Identifying a cognitive activity did not indicate how well that thinking was being done (e.g., a named action could be appropriate or inappropriate), but that was addressed in the content assessment.

**Content assessment** involved carefully reviewing the transcripts on three scales for:

- evidence of appropriateness and depth;
- accuracy and likelihood (correct, probable, possible, unlikely, incorrect);
- completeness (should be more complete, reasonably complete, exceptionally complete).

The **actions** students proposed to take were then listed and categorized:

- Assess and monitor
- Direct patient care
- Patient and family teaching
- Communication with patient and family
- Referrals and contacts with other professionals
- Discharge planning

There are several terms which have multiple meanings in usual usage; in this report they are used in the following ways:

- **College** – refers to the three governing bodies: College of Licensed Practical Nurses of Alberta, College of Registered Nurses of Alberta, and College of Registered Psychiatric Nurses of Alberta.
- **School** – refers to the academic programs that prepare the three types of nurse.
- **Type of nurse** – is the term used to differentiate amongst categories of nurse. Three types of nurse were included in this study: LPN, RN, RPN.
• Case management – refers to managing the patient’s situation and is in contrast to carrying out specific actions. It involves attending to key patient issues in ways that address the underlying problem and facilitate the patient’s progress to an improved state of health. It usually implies a number of actions; for example, stabilizing a patient’s medications is a case management function, while administering medications is not per se, since stabilizing involves such matters as monitoring the patient’s response to medications (intended and side effects), monitoring the appropriate lab reports, communicating with the physician and pharmacist, and educating the patient and family. Administering the medications could be one step in this larger process.

In summary, qualitative methodology resting on notions of congruence and appropriate granularity was applied to the task of comparing knowledge bases of three types of nurse. Techniques included document analysis, interviews with faculty and students, and focus groups with students close to completion of program. The data yielded a variety of points of comparison. The interpretation of these follows.
EXPLORING THE DATA

A curriculum framework noted in the introduction to this report serves as a guideline to organize the data analysis and interpretation. It cites five curricula that are involved in any act of teaching and learning:

- the **ideal curriculum** -- what scholars say should be taught
- the **formal curriculum** -- what a governing body has mandated
- the **perceived curriculum** -- what teachers believe they are teaching
- the **experiential curriculum** -- what students believe they are learning
- the **operational curriculum** -- what observers see

(Goodlad cited by Farrell, 1991)

The ideal curriculum, in this case what nursing scholars indicate nursing students ought to learn, was beyond the scope of this research and will not be addressed. The formal curriculum here consists of the relevant portions of the Alberta Health Professions Act and the scope of practice and competencies documents issued by any of the three nursing colleges (CLPNA, CRPNA, CARNA); these together constitute the ‘governing body’ requirements for which nurses are accountable. The perceived curriculum is addressed through examination of some basic program materials provided by the nursing schools which participated in the research and by interviews with instructors in those programs. Observing what content nursing instructors are teaching and how they are teaching it was beyond the scope of this research; so also was any program evaluation. The experiential curriculum (what students believe that are learning) must necessarily be considered by listening to what students say; in this research that took the form of interviews with nursing students in the participating programs and their self-assessment of their learning. With regard to the operational curriculum which observers see, it may well be that Goodlad had in mind what an expert observer would see while sitting in the back of a classroom during a series of lessons. However, in this work, the operational curriculum took the form of focus groups in which observers paid close attention as nursing students prepared plans of care for two hypothetical patients.

Thus, the usage of these concepts may well be a variation on what their author originally intended, but they still served as a helpful framework to organize the data and the discussion.

The Formal Curriculum

With regards to this study, the formal curriculum for nursing in Alberta consists of official program directives as contained in the Health Professions Act, including legislated practice statements, and as issued by the three nursing colleges.

Since the literature review has already described the situation, it will be summarized here.

The Health Professions Act, a document of provincial government legislation, takes precedence. Like any such document, it must be interpreted.

Each of the three nursing colleges (CRPNA, CLPNA, CARNA) is required to set standards of practice in accordance with the legislation. The colleges have also provided other documents intended to give clarification, each for their own type of nurse. For the purpose of this work, two sets of documents are relevant: scope of practice statements reflecting the
role each type of nurse fulfills based on education and the competencies statements which describe that knowledge in practice.

Scope of Practice: The Canadian Nurses Association (2009) holds that ‘scope of practice’ is the basis for standards of practice, educational preparation, and job descriptions. The approaches to describing scope of practice taken by the three nursing colleges are varied. CARN A (2005) has a multi-paged document divided into these sections: legislation, and foundations of RN practice which include clinical practice, administration, education, and research. CLPNA has a one page practice statement (Professional Responsibility and Accountability, 2003). The CRPNA statement (2005) is what is set out in the Alberta Health Professions Act for Registered Psychiatric and Mental Deficiency Nurses Profession Regulation.

Competencies: There is little consistency in the way the three colleges have organized their competencies. The RN competencies are divided into 5 categories: professional responsibility and accountability; knowledge-based practice; ethical practice; service to the public, and self-regulation (CARN A, 2006). There are 24 categories of LPN competencies: nursing knowledge; nursing process; safety; communication and interpersonal skills; nursing practice; competencies for each of 15 areas of nursing (e.g., respiratory care; surgical care; maternal/newborn care; mental health nursing; clinic based nursing, etc.); medication administration; infusion therapy; professionalism; and the LPN leadership role (CLPNA, 2005). The RPN competencies are grouped into 8 categories: therapeutic psychiatric nursing practice; theory-based psychiatric nursing practice; application of the nursing process; integration of critical thinking and clinical judgment; psychiatric nursing education; administration; research; and professionalism (Alberta Health and Wellness, 2001). Also, the LPN and RPN competencies are described in more detail than the RN competencies.

The situation for both scope of practice statements and competency statements is that: “…each regulatory body has adopted different approaches, use of language and interpretation” (Basford & Orr, 2005, p.4). Comparisons of both scope of practice and competency documents ought to yield useful information about differences in the work of the three types of nurse, but the varying approaches taken make comparisons very challenging. A first step toward addressing this difficulty is found in a short paper, “Collaborative nursing practice in Alberta, prepared in 2003 by the three colleges; but it is only a beginning.

If there is a desire to sort out the present uncertainties about the overlap of responsibilities amongst nurses, and if it is deemed sensible to make comparisons more available to employers and administrators as well as to nurses themselves, then alignment of scope of practice statements is necessary. A similar alignment of competency statements may be somewhat less pressing, but would certainly be helpful.

The Perceived Curriculum

The perceived curriculum focuses on teachers’ actions and views as they participate in building programs, prepare courses and lessons, teach, and interact with students. Thus, this section gives attention to: program information provided by the schools involved; different teaching approaches used by those schools; and the statements of instructors interviewed on teaching, what constitutes the foundational knowledge base for their type of nurse, and their perceptions of the role of other types of nurse.
Nursing Education Programs

Unless otherwise indicated, information about program requirements pertains to the programs included in the study.

The curriculum for each educational program is planned to cover the scope of practice and include the entry-to-practice competencies for the type of nurse being prepared. Programs are designed to promote student success in writing credentialing exams and in generating the ability to provide safe, competent patient care.

Students in all three types of programs involved in the project take courses in related areas beyond nursing itself, study nursing theory and practice, and fulfill clinical practicum requirements. Programs preparing students for the same credential are similar, though not necessarily identical, in length and scope.

According to Advanced Education’s Program Approval Framework, the standard nursing programs in Alberta are to be:

- **Practical Nurse (LPN) Diploma Program:** 2 years (normally 4 semesters)
- **Baccalaureate Degree Program in Nursing (RN):** 4 years (normally 8 semesters, not including spring sessions) [Accelerated and post-degree programs are not included here because they were not included in the study.]
- **Psychiatric Nursing (RPN) Diploma Program:** 2.5 years (normally 5 semesters, not including spring sessions)

The exact length of a semester is determined by each educational institution.

(Information provided by Laura Schneider, Manager, Health and Service Programs, Advanced Education, Government of Alberta.)

Program information following is a summary only, for the reader’s convenience. More detailed information about any particular nursing program is available from the school itself.

**Non Nursing Courses**

All three types of programs include three credit courses in English, psychology and sociology. For LPNs this includes six credits of anatomy and physiology, and three of pathophysiology. RPNs complete 1 anatomy course, 2 physiology courses, and 1 pathophysiology course; each is three credits. They also complete a teaching and learning in health care course and a microbiology course. RNs also take a microbiology course. They take philosophy, statistics, and 2 to 4 three credit options. RNs complete 2 or 3 anatomy and physiology, and biology courses; pathophysiology is integrated into nursing theory courses.

**Nursing Theory Courses**

LPNs take 11 nursing theory courses: Health Education/Personal Health and Wellness; Communication; Nursing Foundations; Health Assessment; Pharmacology; Medical/Surgical Nursing; Maternal/Child Family Nursing; Pediatric Nursing; Pediatric Nursing; Mental Health Nursing; Community Nursing; and Transition to Graduation. These are all three or four credit courses with the exception of medical/surgical where the credits range between seven and nine and include lab practice.

RPNs take 11 nursing theory courses: Communication; 2 Nursing Foundations; Discipline of Psychiatric Nursing; Health Assessment; Pharmacology; Alterations in Health across the
Lifespan, Nursing Care Across the Lifespan; and 3 Mental Health Nursing; one has clinical hours and another prepares the students for transition into the graduate nurse role. (http://www.macewan.ca/web/hcs/psychiatric/Program/CourseList.cfm?MenuOption=1&Line=6)

The RN programs included in the study each offer a nursing research course with three to five credits in nursing foundations. Some foundational courses include lab practice and/or clinical hours. Health assessment is either included in the foundational courses or offered as a discrete course. None have a discrete pediatrics course. Three programs offer pharmacology on its own and the other integrates this content. Two programs offer: health education, older adult, maternal/child, issues in practice, and rural nursing. Three offer adult nursing; three also have mental health nursing, and a leadership and management course, and three also offer community nursing. Two programs provide four credits in communication.

It is important to note that, in all cases, naming the title of a course or the number of credits which a student may earn in a particular area gives very limited information. It says nothing about the breadth or depth in which a topic is covered, the level of detail, or the extent to which the topic is free-standing or connected to other topics. So, while the above topics lists do serve to indicate those areas which schools include in their named offerings, no inferences can be made from these lists about intensity of study, nor can comparisons be made across types of nursing programs.

Further, some of the RN programs use an alternative to courses as their means of instruction (see Teaching Approaches below), so that even the list of topics can be misleading.

**Clinical Practica**

LPN students complete 775 hours of clinical practice in a variety of settings: continuing/long term care, acute care and community. Beyond these core areas, the schools involved in the project differed slightly in the additional clinical experiences offered, so that students may be required to gain shorter experiences in more areas or to have a longer experience in one or two areas (e.g., maternal/child, pediatric, or mental nursing). Efforts are made to give students a focus practicum in an area of their choosing.

RPNs complete 819 hours of clinical practice: 3 psychiatric practice courses in in-patient and community settings (17 credits), and 2 other practica that focus on persons experiencing acute and chronic health problems (10 credits). The last clinical course is a preceptorship that prepares students for working as graduate nurses.

Clinical hours in the RN programs are typically 1495 (with one outlier program having 1708). Practicum courses occur in a variety of settings: community, continuing care/long term care, and various forms of acute care.

**Inferences Arising**

Even though the above discussion of nursing education programs is deliberately brief and it is necessary to be cautious about conclusions, several inferences can be made (with the caveat that they are inferences only). The mental health emphasis in the RPN program is a key contributor to RPN students’ stronger mental health knowledge. LPN programs focus on giving students a foundational grounding in nursing. The greater breadth of study in RN programs likely contributes to some of the differences in nurse-
thinking (discussed in The Operational Curriculum section). Most RN students were in problem/context based programs which is probably another factor contributing to nurse thinking. The longer a program, the more flexibility there may be in course offerings and topics studied. (Such diversity will not necessarily be present just because more time is available—it is only that there is more potential for it.) The overviews of the programs indicate that RNs have the most extensive work in nursing theory and clinical experience, so while depth cannot be inferred, there is opportunity for breadth and depth.

**Teaching Approaches**

At each participating site several faculty members were interviewed: the program director, the chair of the curriculum committee or equivalent, a clinical supervisor, and two instructors. Typically that was five persons, although in two cases one person held two positions.

One area explored with faculty was their preferred teaching methods. Not surprisingly, mostly frequently mentioned were lecture and discussion, the mainstays of tertiary education programs generally. A few instructors seemed limited to these basic strategies, but most in all three types of programs went beyond that.

Several instructors candidly stated that they had struggled with teaching. Their students had told them their lectures were boring or they observed that students were not engaged. Very much to their credit, they heeded the message from students and sought to change their instructional methods and improve their teaching.

The RN programs which participated in the project are either using case based learning (CBL) to a greater or lesser degree or are using some related strategies. Instructors spoke of teaching some topics with CBL and others through lecture, or of combining case work with role modeling, demonstration and simulations. The rationale given for CBL included statements that it: requires students to take responsibility for their own learning, develops reflective practice, prompts understanding rather than memorization, and raises many questions. Either students raise questions as they work on the case, or the instructor has the opportunity to ask questions which focus the students’ attention in particular ways. Even when CBL is not used, the emphasis appeared to be on discussion, questioning, and student engagement. The most frequently mentioned goal for instructors was fostering reflective practice.

RPN and LPN instructors, after mentioning lecture (sometimes with PowerPoint presentations and handouts) and discussion, also noted participatory activities such as role-play, simulation, having students select a nursing article and lead a discussion on it, and exercises to actively engage students. One RPN instructor stated that she sees a lot of value in CBL and borrows from it in her teaching, for example by raising an issue with a problem in it and asking students to discuss how they would handle the matter. One LPN instructor had previously been a school teacher and her approach included starting with a pre-assessment to determine what students already know, having activities to discuss or challenge what the instructor has said, holding workshops following instructor presentations, and requiring students to conclude classes by identifying what they have learned and what is still unclear.

In lab situations, instructors in all three types of programs noted the value of modeling, demonstration, student practice of skills and of what had been demonstrated, along with
instructor coaching. Coaching, mentoring and debriefing were strategies noted in clinical supervision.

A number of instructors stated that clinical experience in rural settings is very influential on students’ learning; while this is not a teaching methodology per se, it appeared significant, particularly for one LPN and two RN programs. Work in aboriginal communities was similarly noted. As one instructor observed: “The rural setting is perfect for helping students think more holistically because there’s an independence of practice that’s required in the rural setting that you don’t get in a lot of acute care settings; so it’s the perfect opportunity for them to become very aware of their own approach to practice, start making decisions, start reflecting on how their decisions are impacting care, and it really is the point at which they pull things together.”

Several observations may be made based on the variety noted in teaching approaches, along with the common concern instructors shared to teach effectively and to help students learn well. Case based learning (CBL) is sometimes called context based learning or problem based learning, and while there are subtle differences inherent in these terms, they share a pattern of student centred learning, starting with a practical scenario, usually presented as a narrative, which professionals are likely to encounter in their work, and constructing around it questions, perhaps suggested readings as a starting point, and other instructions to guide students. Students are then required, individually or in small groups, to investigate as thoroughly as they can the topics and issues raised by the case. Having done their seminar preparation by learning all they can, students come to class to discuss with the guidance of a tutor what they have learned and what they are struggling with. Well constructed cases will have been written by experts in the areas under consideration and will involve sufficient complexity that there are no easy or certain answers; rather students are required to take a range of factors into account and to reflect upon what can and cannot realistically be done.

This difference in teaching methodologies gives rise to several considerations relevant to this study.

First, when an instructor uses the term ‘case,’ it quite legitimately has a variety of meanings, all the way from a simple example included in an explanation to a full-fledged, sophisticated and complex CBL study. Of the schools involved in this study, three RN programs indicated they do at least some CBL work; both the program materials and the instructor comments imply that the extent and intensity of CBL work varies considerably.

Second, when a program is offered by CBL, it is not possible to tell at a glance all the topics that are covered. Cases often are deliberately constructed to involve more than one topic, and as students work at them they may well be deliberately pushed from the apparent topic into other related areas. And a particular topic is likely to be a focus in one case, and a secondary issue in several other cases. Curriculum leaders and committees who have access to all the cases (and may well have worked on constructing them) will have sought to ensure that all the mandated topics are included, but all cases must be examined fully to make this determination. In this study to list courses risks giving misleading information, particularly about CBL programs, as it could appear that there is no course in a topic is likely to be part of a number of cases.
Third, even course outlines written in the usual course-based format do not necessarily reveal the depth or extent of attention that will be given to a topic. Thus, it was not possible to determine the depth in which a particular topic is studied, nor to make systematic comparisons across types of nursing programs.

Fourth, another very significant factor is the quality of teaching. How students are taught affects, not only what they learn, but how they hold their knowledge, how it is instantiated, and how effectively they can apply it in professional settings. The teaching needs to be done in such a way that know-what and know-how are inextricably connected.

When CBL is done well, the cases are creatively constructed by content area experts to invite (even inveigle) students into deeper exploration of the topic, and the tutors continue that process. Tutors are adept at requiring students to be hunter gatherers learning as much as possible on their own and solving problems together. In the case tutorial, the tutor asks cogent questions to point students toward something they are missing, or to cause reconsideration where an error has been made, or to get students to explore in greater depth something glossed over, etc. This is highly skilled teaching. When it is done well, it resists the temptation to “hand over” answers, and requires students to work out their own understandings but very much supports them in that quest.

On the other hand, such teaching can all too easily be done poorly, with lack of rigour and reduced learning for students. Thus, it is possible for both the best and the worst kind of learning to arise from CBL. (Like the little girl with the little curl right in the middle of her forehead, it can be very, very good, or horrid.)

Of course, other forms of teaching—lectures, leading seminar discussions, etc.—can also be done very well or badly. While the style of teaching is likely to make a difference in how students hold and manipulate their knowledge, the quality of the teaching by any method is also critical.

Fifth, a program may use mixed methods; for example, part lecture, part CBL. And in fact, mixed methods are more common amongst the programs than strict adherence to one teaching methodology.

Finally, it was outside the parameters of this study to assess teaching. But it seems probable that quality of teaching is one factor—only one of a number of factors, but a significant one—in differences noted (below) about within-type student work.

A further aspect of program, one closely related to teaching is that of the philosophical values instructors hold. Thus, they asked about the key value their program sought to convey to students through their teaching. It was apparent that this had been discussed in some schools as instructors’ responses aligned closely, whereas in others the responses were individual and more wide-ranging.

RPN instructors focused on excellence, caring, communication and leadership. LPN instructors emphasized considering the person as a whole being including culture, context and belief system as well as physical condition, although such down-to-earth matters as passing exams were also mentioned. One RN program focused on caring and diversity, and another on learning to translate theory into ethical standards of practice. In the other two
programs a wider range appeared: reflective practice including critical thinking, relationships including sensitivity to vulnerabilities and inclusiveness, and professional responsibility including self direction, in part because of a concern about unprofessional behaviour. The most commonly mentioned key value for all three types of program was holistic nursing.

**Foundational Knowledge Base**

Instructors were asked what they considered to be the foundational knowledge base for the type of nurse they were instructing.

Held in common for all types of nurse was the idea that “every nurse needs to have an understanding of the total person as a holistic body.”

LPN instructors each stated that the foundation for LPNs is the same as for RNs; the nursing process, in particular, was identified as shared commonly held knowledge, along with communication and basic science such as anatomy, physiology and pathophysiology. The idea that there are differences in the knowledge base is no longer as true as it once was. The difference, LPN instructors indicated, is beyond the foundational level and goes to such matters as: RNs with more study time have greater depth and breadth of knowledge, go more into the care of families, and learn more about community and population health.

RPN instructors noted as foundational for RPNs the same nursing process and basic science, plus their emphasis on the mind and mental health, along with pharmacology, psychotropics and therapeutic communication, a view with which RPN students concurred.

RN instructors were not as unanimous in their views. Some expressed views similar to those of LPN instructors. Others pointed to the following factors that make RN foundational knowledge different. The educational methodology affects foundational knowledge from the beginning; context based learning (or problem based learning), when taught well, makes students better and more critical thinkers, able to make better judgments within a larger context, rather than being task-focused. Half the RN programs surveyed use this methodology. RNs study a breadth of courses in arts and science because they need to know about the climate in which clients live. For RNs, the basic focus is the person and all the health determinants. Relationship is foundational. Research is huge. Only RNs study political action. One instructor offered this summary: "The RN must be accountable for all nursing care, understand all facets of nursing care, including administration, research, practice, education, and be a leader and take responsibility. The other two types of nurse take part of the nursing care; only the RN takes the whole of it."

If these instructor perceptions of what is foundational knowledge for each type of nurse are accurate, they go a considerable distance to articulate both what knowledge a novice nurse has studied and why the foundational knowledge bases are so overlapping with resulting differing or unclear expectations in clinical settings.

**Instructor Perceptions of the Knowledge and Roles of Other Types of Nurse**

Each instructor was asked during the interview what s/he perceived to be the most crucial differences amongst the three types of nurse and what each type of nurse can contribute in a clinical setting. The intent of the question was to be another probe into the knowledge bases of the three types of nurse. Many of the responses spoke more to points of contention among the three types of nurse than specifically to the knowledge held. Because such
perceptions are likely being passed on to students and influencing how they view their chosen professions, they are discussed here even though they do not speak directly to the research questions of the study.

Since the number of RPNs in practice is the smallest of the three types of nurse, and since as long as the large mental hospitals existed in the province their work was heavily concentrated in those institutions, RPN work is in general the least well known. Many nurses in the study (both instructors and students) reported never having worked with an RPN and being unfamiliar with their scope of practice. Those who were familiar with RPN work, as well as the RPNs themselves, stated that the crucial differences which separate them from other nurses are their depth of knowledge in mental health and illness. Repeatedly the statement was that RPNs have depth but not breadth. They do not study some areas (e.g., maternity or pediatrics), and in other areas their study is considerably more limited than that of RNs (e.g., medical surgical) and their clinical experience as students is also both more narrowly focused and more extensive within that specific focus. There was disagreement amongst participants over the extent to which RPNs are able to work outside of mental health units, with some participants arguing they have a role in medical or surgical units, and others seeing that as a poor use of limited human resources.

Discussion of the crucial differences between the LPN and the RN roles reveals areas where there appears to be broad agreement along the following lines. LPNs are more hands-on, more task oriented, focused on restoring health more than on health promotion, and very able to perform specific techniques. RNs are more conceptually oriented, more geared toward population health and health promotion, better able to engage in problem solving, and better prepared to deal with rapidly changing or unstable patients and complex cases. It would be possible to coordinate at what point the instability or complexity requires an RN. In addition, RNs are better able to give leadership, do case management and help the client or patient navigate through the health care system. Also, knowing and applying research in such a way as to do integrative thinking appears to be considered the domain of RNs. These observations from instructors were supported by the quality of the nurse-thinking done in the scenarios. It is notable that all of these have to do with nursing education and what the two types of nurse are prepared for. This description of the role of RNs includes what seem, not only critical aspects of the RN role, but also an important part of the basis of the role differences.

However when it comes to practice, discussion of the crucial differences between the two also reveals just how fuzzy the boundaries are and how much overlap exists in practice in clinical and other settings. There are many tasks that both are licensed to perform. That inevitably gives rise to the question of who ought be doing what. For example, should RNs be doing bedside care of patients who are stable and responding in clinically normal ways? There are two standard and contrastive answers.

Answer 1 - Yes. It is not merely a matter of having the skill, but also of considering the context and noticing all the surrounding factors. With wound care, LPNs are just as able as RNs to describe the wound and to do dressing changes in a clinically approved manner, but the RN has greater depth of knowledge and will at the same time be including such factors as: is this person a smoker? what is the history of the wound? how does the state of this wound and its healing compare with what is to be expected? Or in the case of giving an injection, LPNs know and can apply the technique as well as RNs, but RNs are better able to think through all the implications of what medication is being administered in what dosage, and what the arm looks like.
Answer 2 - No. LPNs are just as accomplished as RNs, and in some cases more so, at bedside nursing and the requisite skills and techniques. They do that work well, so let them do it. In these days of nursing shortages, the RNs are needed for other responsibilities such as case management, liaison with other professionals, educating patients and their families, dealing with complex cases, being charge nurses, and giving leadership.

When considering what each type of nurse contributes in a clinical setting, instructors generally indicated that LPNs have good skills and technique, are task oriented and practical and are well able to give good bedside care. Other instructors noted that RPNs have strength in geriatrics and in mental health, ability to communicate and cope with mentally ill persons, knowledge of the relevant medications, as well as ability to defuse situations and calm people down. (Interestingly, RPNs themselves made no mention of geriatrics and dementia in older persons as areas of strength.) RNs have the widest scope of practice and frequently carry greater responsibility, especially in areas such as leadership, interfacing with the larger organization and with other health professionals, case management including teaching and planning the next steps of a client’s health care, and also what one instructor termed the “invisible parts of nursing,” such as planning, in-depth assessment and integrative thinking.

This seems to summarize both what many participants think should be and also what frequently is the situation. That is probably a significant factor in why the nursing system works as well as it does. However, there are areas of disagreement.

A commonly held view, as expressed by one instructor, is: “Team work is necessary. Nurses need to collaborate more than they do and get rid of all elitism.” At least two barriers were apparent. Firstly, not all participants shared that view. Some value the hierarchy and think it necessary. The more extensive study that RNs have in their training gives greater depth of knowledge, and therefore better understanding of patient or client issues, and thus RNs need to have greater authority. Proponents of each view say that their position is held for reasons of client safety and system efficiency. Secondly, a real barrier to effective collaboration amongst nurses is the lack of clarity about who should be doing what. Sometimes organizations make their own rules and these are contested. It seems that the overlap in scope of practice (which allows all three types of nurse to do certain tasks) is not a problem; in fact, in a health care setting it is helpful and practical to have every nurse able to get on with some of the necessary work. The problem is with the fuzzy boundaries which leave room for debate about ‘whose job it really is’ and whether the LPNs with good skills can give very adequate care or RNs with greater depth of knowledge need to give the care because they can not only do the task but at the same time make more sophisticated observations (e.g., about what is causing a certain condition, or that a patient’s condition is deteriorating and further intervention is required). This goes to the heart of much of the disagreement amongst nurses about who should do what.

Critical thinking is contested space. There is broad agreement that RNs are expected to do it well, though that expectation does not speak to how well they actually do it in practice. Some instructors hold that only RNs are specifically taught to think that way; LPN and RPN instructors indicate that it is also a necessary part of their programs. There is perhaps more claim of critical thinking than evidence to show how much it varies from one type of nurse to another, though in the scenario discussions RN students gave indication of somewhat more integrative and critical nurse-thinking. Another significant and compounding factor is the individual; some individuals, whether nurses or not, are clearer thinkers than others. Certainly critical and integrative thinking are vital to problem solving which nurses need to do.
The increase in the LPN scope of practice has led to two different contentious issues for LPNs and RNs. For the LPNs it is that of the relationship between responsibilities and remuneration. It was frequently noted that LPNs are feeling that they are being asked to take on more of the work formerly done by RNs without receiving a more equivalent salary. When LPN student nurses were asked at the end of the interview if there was anything else they would like to add, the comment most commonly made was that LPNs are underpaid. The resentment on this point amongst both faculty and students seems very real.

For RNs the issue is where their role is and what they are, or are not, moving into. “LPNs have embraced the new roles more than RNs have, possibly because the RN role was not clearly defined and it was not clear to RNs what they could grab onto. The present role of LPNs is somewhat similar to the role of RNs graduating from hospital programs in the past. RNs, I sense, have moved up a layer and are now more specialized. LPNs know the difference, RNs are asking what it is.” Interviewees indicated that it is mostly older RNs who feel this concern; that is understandable given how people become comfortable with a role they have filled for some years. Others are open to change. It is evident that there are big potential opportunities for RNs, and articulating clearly what they are and getting the message out to all RNs would be a useful contribution.

The Experiential Curriculum

Experiential curriculum data were gathered from student interviews. At each participating site eight to ten student volunteers were interviewed; all students were very close to graduation and were thinking about upcoming exams and finding employment positions, as well as anticipating starting their nursing practice with their own certification.

Student interviews clustered around three general areas. Students were first asked for a self-assessment of their own individual nursing knowledge: in which areas did they feel particularly confident of what they knew and in which areas did they feel a need to learn more before they could practice comfortably. Two questions then required students to draw upon their nursing knowledge to indicate appropriate nursing actions. Students were also asked to comment on the work of the other types of nurse, based on their clinical experiences. In order to connect more directly to the section immediately above in which instructors provided their perceptions of the role of other nurses, the third area is discussed first.

Student Perceptions of the Knowledge and Roles of Other Types of Nurse

Students were asked what they saw as the differences between themselves and the other two types of nurse. Their answers were influenced by their clinical experience. Because RPN students learn their practice primarily in psychiatric settings their interaction with the other types of nurse is more limited. The LPN students had not had any experience in working with RPNs.

LPN Students’ Perceptions of RNs

From a practice perspective, LPNs see more similarities than differences between themselves and RNs. They are both knowledgeable, applying their knowledge equally well. They create care plans, consult with others, and share the common goal of what is best for the patient. The LPNs see little difference in the clinical settings as LPNs are caring for the same types of patients and doing the same things as RNs. The differences have blurred
over time and even though their scopes of practice are different, they seem similar in practice. While LPNs think RNs have more education, they are not sure what that really means and they wonder if the differences between the two types of nurse have more to do with experience than education. RNs are paid more which makes some LPNs resentful. Some differences are dependent on the setting. For example, RNs care for less stable patients than LPNs, they look after IVs, give medications, and do the more complicated procedures. LPNs see themselves as doing more of the bedside care, or as one put it “more of the actual physical labor work” which make them ‘experts’ in bedside care.

**RN Students’ Perceptions of LPNs**

Like LPNs, RNs saw little difference between the scopes of practice and the procedures done by LPNs and RNs. However, some see their education as making a big difference in how they see things and go about things, while others are not sure what the difference in length of program really means in practice. Their scopes of practice overlap and there are many similarities in the procedures they do. Some think it has to do with what they learn about critical thinking, and backing up what they do with research. RNs think LPN education is more focused on skills and they learn less about models of nursing, psychosocial care, primary health care, pathophysiology, and lab values. Like LPNs, RN students see the roles blurring and with experience they can do pretty well the same thing. One RN student recounted a situation where the LPN with more experience in wound care assisted the RN with a dressing. The RN said because the LPN ‘knew the ins and outs’ of everything she ‘might just as well have been an RN.’ With staffing shortages LPNs are being assigned to as many and as complex patients as RNs are. RNs believe their education means they can think more critically, access information more effectively, and use research based knowledge and nursing theory. According to the RN students they go beyond the immediate and look at the bigger picture, are less task focused and more anticipatory, ask the ‘why’ questions, and do more problem solving. Here are two examples included in responses: (1) LPNs know that a blood pressure of 88/78 is not normal, but RNs would problem solve and know they had to check to be sure the equipment was working properly before taking further action. (2) If a patient is complaining of chest pain the RN would figure out whether it was really chest pain or perhaps indigestion from a spicy meal. The LPN would immediately think it was a cardiac problem without further assessment. RNs say they look after patients with more complex needs and are attentive to different things. They see the bigger picture, do more thorough assessments, and deal more directly with patient concerns. LPNs are more focused on the here-and-now. One RN described it this way: “LPNs do the care, they help people to the bathroom, while RNs do blood work, work with the doctors, and the transition of patients from one setting to another. They are in charge nurse positions and they have more leadership training.” Some RN students do not realize that LPNs are responsible for their own practice, rather many seem to believe that as RNs they will be held accountable for that practice.

**RN Students’ Perceptions of RPNs**

RNs think RPNs have the same goal as they do: promoting patient independence and autonomy, and they both use the nursing process. In practice they do not see much difference particularly when the RN has additional psychiatric nursing education. The RN students believe the RPNs have a lot more psychiatric knowledge and they focus on the patient’s feelings and psychosocial needs rather than patient safety and physical needs. One RN student gave this example: “When a patient has chest pain the RPN assumes it is anxiety and gives the patient Ativan, missing the fact that it was a cardiac emergency.” RPNs are better equipped to deal with patients’ emotional issues and their mental state, and
they have better communication skills. RNs say they are more focused on diagnostics, lab tests, how the patient is feeling physically. RNs are more task-focused leaving little time to sit and talk with the patient about how s/he is feeling.

*RPN Students’ Perceptions of RNs*

RPNs believe they learn the same ‘basic skills set’ (other than pediatrics and obstetrics) as RNs and if they both work in psychiatry there is little difference in what they do. Because RNs have more medical-surgical knowledge they “pick up on things faster than us, or at least without worrying about it.” RNs are better at nursing skills as they have more practice. Some see the difference as a matter of degree: RPNs have a bit more psych and RNs have a bit more medicine. Others think the RNs skills set is very different than RPNs because they attend more to physical problems than patients’ emotional state. “RN don’t talk to patients much - they do what they need to do and they’re out the door.” RPNs believe RNs are more task focused while they [RPNs] look at the big picture. As one RPN put it, “The first thing the RN sees is the IV pump and the first thing I see is the person. It’s life versus quality of life.” RPNs believe they are more specialized in communication skills than RNs. Some RPNs think that with experience the differences between themselves and RNs become less.

*RPN Students’ Perceptions of LPNs*

RPNs who had worked with LPNs in their medical-surgical rotations, say their roles overlap when it comes to personal care and bedside skills, medications, dealing with doctors, and empathy. They believe that because LPNs have a shorter program they have less depth in their medical-surgical and psychiatric knowledge. Like RNs who also have less psychiatric knowledge and interpersonal training, LPNs ‘don’t get the bigger picture of nursing practice.’ RPNs describe LPN work as ‘more like working as a mechanic’ because they deal with the same problems every day, and they place more emphasis on physical problems. They believe LPNs deal with the here and now, focusing on tasks whereas they (and RNs) deal with the bigger picture. They also believe that they focus more on mental health while LPNs (and RNs) focus more on physical health. RPN students say they learn more communication skills and they use more critical thinking skills.

_In summary_, students saw more potential differences among the three types of nurse based on education than they did in practice.

Students also commented on the overlap among types of nurse. Some saw little difference; for example, one RPN student stated, “All three types of nurse do the same things, we’re interchangeable – we can pick up each other’s work, though we have different focus.” Other students were more aware of difference, sometimes based on type of nurse and sometimes on the extent of individual experience. Differences between RPNs and RNs were seen as a matter of emphasis (medical surgical versus psychiatric), and differences between RNs and LPNs, as reported by the students, become more blurred as LPNs gain more experience.

It is likely that if the skills of each type of nurse are not used to their fullest, differences will not be apparent. It may also be that these students have not had enough experience to see the differences. Or perhaps, as a number described, differences may be reduced with experience.

When the focus group work was analyzed, it became apparent that in the work of the novice nurses in the study, there were very real differences amongst types of nurse in the knowledge and understanding demonstrated; thus, what students did was not fully congruent with their comments in this regard.
Student Perceptions of Confidence and Congruence with Observed Responses

Students were asked what areas of knowledge and practice they were most confident about and in what areas they felt the least confident. Each student was invited to list as few or many areas as they chose, so some students gave longer lists than others. Their responses pertained to: (1) clinical practice areas, (2) medications, (3) pathophysiology, (4) assessment skills, (5) lab tests, (6) treatments and procedures, (7) bedside care, (8) communicating with patients, (9) teamwork, and (10) critical thinking. Included here is the congruence between students’ perceived confidence and how they managed the scenarios and the individual interview questions on caring patients with particular conditions.

RN students reported confidence (most or least) for the broadest range of clinical areas and for the most part this can be explained by the broader range of clinical courses they take. Psychiatry was the area of greatest confidence for RPNs, less so for RNs, and not mentioned by LPN students. Although LPN students do take a mental health theory course and can choose mental health for their focused practicum, as a rule they do not have a psychiatric clinical rotation. RNs reported medical-surgical nursing as an area of greatest confidence; LPNs did as well, but to a lesser extent. RPN students were more inclined to report medical-surgical nursing as an area of least confidence because they had not worked in the area for some time. A few LPNs and RPNs reported long term care as an area of most confidence—both types of nurse have long term care clinical experiences. While RNs also do long term care clinical rotations they did not mention this area. RN students were the only group to report maternity, ICU, and the OR as areas of confidence—some identified them as areas of greatest confidence and some as least. LPNs can choose maternity for their focused practicum and they do take a maternal/child, family nursing course. RPNs do not study or practice in this area. All three types of students were more likely to report pediatrics as an area of least confidence. This is not surprising for LPNs and RPNs as they do not all have clinical experience in pediatrics. However, RNs do have a pediatric clinical rotation.

Students’ reported confidence in clinical areas was congruent with how they handled the scenarios. In Scenario A, RNs’ knowledge of medical surgical nursing was the strongest, followed by LPNs, then RPNs. The RPNs focused first on the patient’s mental status and later moved on to address his more physical problems, which were really more critical.

Being able to problem-solve a complex case with reasonable ease and accuracy would contribute to feelings of confidence. The RPN students handled Scenario B with ease, recalling their clinical experiences as well as their knowledge base. In this scenario the RNs were tentative and used less nurse-thinking. The LPNs held back from dealing with the patient’s mental health problems, and used nurse-thinking only when addressing his physical problems.

Students’ reports of confidence in pathophysiology and critical thinking are closely related to the above discussion. Even though the RNs’ knowledge of medical surgical nursing was the strongest of the three types of nurse, they were just as likely to report pathophysiology as an area of most confidence as of least confidence. LPNs and RPNs did not report this area at all. Interestingly, these two types of student nurses take a pathophysiology theory course, whereas in the RN programs it is integrated into other theory courses. Whether or not students learn more or less pathophysiology in integrated versus stand-alone courses is unknown. The RN students were the only type of nurse to report confidence in their ability to think critically, both closely related to nurse-thinking and problem solving. This is congruent with how they handled the scenarios, particularly Scenario A.
There were two areas of confidence related to medications: pharmacological knowledge and medication administration. Students of all types were more likely to report pharmacological knowledge as an area of least confidence. For the LPNs this is congruent with how they handled the scenarios: one of their first steps was to look up the medications. It is less congruent for the RN students who appeared quite confident in their medication knowledge in both scenarios. The RPNs demonstrated even stronger knowledge of the psychiatric medications in Scenario B and satisfactory knowledge of those in Scenario A. Students’ confidence in administering medications followed a similar pattern. RNs reported confidence in medication administration to a greater extent than LPNs or RPNs. RPNs reported confidence in administering psychiatric medications.

LPNs and RNs were most likely to report bedside care as an area of most confidence. The range of treatments and procedures on which they reported confidence was wide, and the number of students reporting least confidence was small. However, in the scenarios all three types of nurse placed little emphasis on bedside care. In fact, in Scenario A all three types omitted key patient issues that would impact the direct care they should be giving: the impact that the patient’s stroke affecting his left side, plus pain in his right foot, would have on his mobility; also that he was a diabetic on sliding scale and would have been given insulin.

RNs were the only type of nurse to report lab tests in response to the questions on confidence, with the number reporting it an area of least confidence predominating over those reporting as an area of most confidence. They reported lacking confidence in differentiating normal from abnormal test results and knowing what actions to take. This is somewhat incongruent with the scenarios where they appeared to understand the tests and recognized their significance to the patient’s care.

RN and RPN students included assessment skills as an area of confidence, with the RNs more confident with physical assessment and the RPNs with mental status assessment. This is congruent with the scenarios where RPNs’ assessments in Scenario B were stronger than RNs’ assessments, and the RNs’ assessments in Scenario A were stronger than those of RPNs. This congruence is partially supported by the RPNs’ and RNs’ answers to the interview question about assessing a patient with congestive heart failure. The RPNs did not answer this question with confidence. With prompting some were able to state priority assessments, but their rationale showed limited understanding of the underlying pathology of congestive heart failure. While the RNs were able to name three priority assessments, their understanding of the pathology ranged from very strong to bare minimum. The LPNs did not include assessment as an area of confidence (most or least). These findings are interesting given that in the scenarios, assessment and monitoring were the most commonly mentioned nursing actions.

Interview Questions Focused on Nursing Actions

Two of the interview questions asked students to indicate the immediate nursing care that would be needed in response to two patient conditions. One question described a child who had survived a plane crash in which her grandfather died and from which she had minor head injuries; students were asked to indicate how they would start to think about caring for the child. They were also asked how they would approach the child’s parents. The second question asked for their three priority assessments upon first being assigned to a patient with congestive heart failure. Following is a discussion of the individual responses to these questions.
Students’ responses to the interview question of the child with a head injury suggest incongruence. Most LPN students realized they would need to do a neurological assessment, however their knowledge of this type of assessment varied considerably. Some knew the key elements of neural assessments and others did not. The RPNs’ knowledge of neurological assessment was limited and they expressed a lack of confidence in this area. Most knew they needed to assess the patient’s level of consciousness, but they did not specify they would be doing a neurological assessment and their knowledge of what that entailed was quite limited. A few LPNs and RPNs missed the mark entirely; for example, they would do a mini-mental assessment, assess the patient’s eye contact, or see how the child responded to conversation. Although not all of the RN students zeroed in on neurological assessment, those that did were able to describe specific assessment points (e.g., pupil reactions, grip strength, Glasgow Coma Scale). These findings suggest the assessment skills of all three types of students may not be as strong as they think.

RNs reported communication skills as an area of most confidence. RPNs were confident in their ability to establish therapeutic relationships with patients, often referring to ‘therapeutic use of self.’ LPNs were confident in their ability to be empathetic and were somewhat confident about communication, but also were hesitant and would defer to other professionals rather than talking directly to the patient themselves, in part because they were unsure how much they should reveal and what should be left to the physician to explain.

However, the communication indicated by all three types of nursing students would not necessarily be described as ‘therapeutic’ in nature: gathering information (or seeking understanding) about the patient, either from the patient or his/her family. And while RN and RPN students reported confidence in their ability to communicate, this was not necessarily suggested by their responses to the parents of the injured child. It can be assumed that these parents would be both relieved that their child was alive and worried about her condition, and at the same time would be grieving the loss of a parent. Some students showed real empathy, while others apparently failed to recognize the parents’ mixed emotions.

Although the LPNs were more aware of the emotional needs of the parents than those of the child, they suggested some reasonable strategies for approaching both. Some were unsure about what they could say and do. The RNs addressed the emotional needs of the child and the parents reasonably well. They had a repertoire of approaches for working with both of them: empathy, reassurance, comfort, easily understood explanations, honest and open communication. This repertoire is an amalgam of responses across students: individual responses were very much more limited. Many indicated they would talk to the parents before taking them to their daughter. A few considered the developmental needs of a 7 year old. The RPNs’ consideration of the child’s emotional and communication needs was stronger than of her physical needs. They were generally aware of how the child and the parents would be feeling, and how to approach them. Their typical approach to the parents was to see how they were handling things, provide support and information, and then have them see their daughter. Amongst the three types of students, there was some lack of clarity about the nurse’s role in communicating information about medical status. Some students thought they should tell the parents anything they could; others, particularly LPNs, thought the doctor was the only one to provide information.

How the students handled the physical and emotional needs of the child with the head injury provides some insight into their priority setting. All three types of students tended to put the
child’s emotional needs ahead of her physical needs. They knew her head injury needed attention, but their first or simultaneous concern was for how she was feeling about being in hospital and what had happened to her. Perhaps this would have been different if the child had suffered a severe head injury. That said, all students should have recognized the need for diligent observation of levels of consciousness, particularly in children.

RNs were the only type of nursing student to mention teamwork as an area of confidence, and they mostly reported it as an area of least confidence. They felt they lacked confidence in delegating to others, communicating with the interdisciplinary team, and understanding others’ roles in meeting patients’ needs. However, their case management approach to communicating with others does suggest confidence and ability in their teamwork skills.

In summary, RN students reported the broadest scope of confidence areas (most or least). For clinical areas this is mostly explained by the clinical courses each group takes. Students did say their confidence in clinical areas depended on how much experience they had in the area and how long ago, their knowledge and skill levels at the time, and their interests. RNs are strongest in medical surgical nursing, followed by LPNs. RPNs are strongest in psychiatric nursing, followed by RNs. RNs demonstrated greater pathophysiological knowledge than was evident in their confidence statements. LPNs’ pharmacological and medication administration knowledge demonstrated in the scenarios and their reports of least confidence were congruent. RNs’ reports of least confidence in this area were incongruent with how they handled the scenarios. RPNs’ reports of being confident were congruent with their knowledge of psychiatric medications. Although RN and LPN students reported confidence in bedside care, none of the three types emphasized this in the scenarios and in fact omitted some important points. RNs expressed less confidence in understanding lab tests than they demonstrated in the scenarios. Although students claim confidence in their assessment skills, the scenarios and the congestive heart failure question suggest otherwise. It is likely RN and RPN students have communication skills that are congruent with feeling confident in this area. Congruence between LPNs’ feelings of least confidence and skill may also be true. All students would have had some, perhaps limited, experience with setting priorities, at least for the patients assigned to them on any given day during clinical experiences; nevertheless, they did not seem as able to do this as might be expected. RN students recognized their role as case managers, but also felt not yet ready to take on that task, no doubt because of limited experience with it.

The Operational Curriculum

Goodlad’s framework includes attending to the curriculum that expert observers see at play in a teaching and learning environment. In this study, that did not take the form of sitting in classes being taught—though the focus groups were held in classrooms with students sitting around a table—but rather of creating a nursing task which students could undertake apart from a clinical setting. This task was developed for use in a classroom, in a similar manner to the way in which teachers design tasks to enhance student learning in classes. The significant difference, of course, was that for the focus groups no teacher was participating in their work and the purpose was not to teach but to observe how students went about the task, though students frequently commented at the end of the session that it was a good learning opportunity for them.

Since students were not observed in the classroom, in the practice lab, nor in clinical settings, an activity was devised to gain at least some sense of how these nursing students might think about a nursing task in a clinical setting. This took the form of focus groups in
which a small group of four to six (usually five) students were asked to imagine themselves working in a hospital and proceed as they deemed appropriate on the basis of their nursing education and experience to date. Following is a comparison of the work done by the three types of nursing students (LPN, RN and RPN) on the two scenarios in which they were presented with hypothetical patients and asked to prepare a plan of care for each.

The following discussion is based upon the content (accuracy, completeness, depth and appropriateness) of the work of participating student nurses. When evaluative terms are used, such as: ‘one group did better work than another,’ ‘one group was weak in…’ or ‘one group did very good work with…,’ these statements are a shortened means of expressing the accuracy, completeness, depth, and appropriateness of the student discussion and the resulting plan of care. The discussion following also takes into account the cognitive activities students gave evidence of doing.

The discussion is organized into the following sections:

- Approach -- how students went about the task of preparing a plan of care;
- Thinking patterns – the kind of thinking the students appeared to be doing;
- Understanding the case –how students talked their way through and made sense of the various factors noted about a patient’s condition and their interactive effects;
- Reading lab reports – how students made use of, or struggled to understand, the information coming back from lab tests;
- Actions – what students proposed to do for a particular patient.

It should be noted that, although the discussion is divided into different sub-topics in order to make it manageable, they overlap, even intertwine, and ought to be taken as a whole in order to get a glimpse into the knowledge and thinking of the participants.

**Approach to the Task**

Each set of LPN students used the same systematic approach: first, review the case, basically saying aloud what they knew from reading the scenario, along with looking up any drug information they did not recall or wanted to have fresh in their minds; second, go over the whole case again seeking to understand it, raising questions, making any interpretations and connections they could; and third, prepare a plan of care, including nursing actions. Since this approach to the task was so consistent, it is strongly suggestive of being a learned strategy.

By contrast, each group of RN students approached the task differently, although a common factor was the tendency to “leap right in.” For example, with Scenario A, two groups began with discharge planning, and the other two with seeking to understand the patient’s condition and situation. Similarly with Scenario B, two groups began by naming actions followed by nurse-thinking, while another began with nurse-thinking to understand the situation. From the beginning this group was analyzing using nurse-thinking while referencing the scenarios and recalling what they knew from their studies and experiences. Recall of previous learning was also used in two ways in the talk: sometimes it was evidence for a claim, as when a student would assert a claim about the cause of a patient’s difficulty and support that by referring to clinical experience; other times, the reference to previous experience was simply woven into the discussion of how, for example, a urinary tract infection or diabetes works, without being evidence for anything.
One RN group started with naming actions to be taken and justified them with nurse-thinking. Although that may sound backwards, these students prepared an appropriate plan of care. However, their approach was a form of acting ‘without a safety net’ that left them vulnerable to making unsupported assumptions; for example, they assumed that the patient had deep vein thrombosis when it was more likely diabetic neuropathy. Another set of students, more predictably, used nurse-thinking to work their way toward determining appropriate actions. A third group tended to move rapidly from one topic to another dealing with each very briefly; for example, they noted that the patient had prostate problems but seemed unsure of the meaning of the lab test results or what to suggest for the patient and simply dropped the topic. This approach left them vulnerable to significant omissions. A fourth group employed a systematic and logical thinking process and focused primarily on long term issues, with which they were accurate and relatively complete, but their work on immediate nursing needs was incomplete.

In seeking to understand what was happening to the patient, the RN students tended to identify a single issue, sort it out and move on to the next matter. For example, in Scenario A, they might consider the patient’s diabetes before moving on to his UTI or to his history of having a stroke, and then wonder “What’s going on with his puffy right foot?” There is a kind of efficiency in this approach, accompanied by a risk that an issue will be missed, or the inter-active effects of two or more issues not be considered, the latter more likely than the former. Nevertheless, in general, this approach served the RN students well.

By comparison, then, the approach taken by LPN students was more linear, and possibly more organized. These students tended to list items and think about them carefully; they were more hesitant and cautious than the RN students, and more likely to talk to the charge nurse or the physician before taking action.

The LPN students were also more focused than the RNs on details: for example how frequently to monitor a particular condition, with a surprising amount of time spent debating whether it should be every 15 minutes or every half hour. At times a limited depth of knowledge appeared to stand in the way of LPNs understanding what was happening to the patient (e.g., fluid overload is related to circulating blood volume, not urinary retention as they indicated). In contrast the RN students focused more than the LPNs on specific aspects of case management.

Without clinical observation, it is not possible to determine whether there is any difference in the applied knowledge or the quality of bedside care given by the two types of nurse. However, when the LPN students considered bed side care issues, they again appeared to be operating from learned procedure, ensuring that all items were carefully included. The RNs by contrast showed a greater degree of flexibility, starting differently, selecting which items to include or ignore, and shaping the task as seemed appropriate to them.

One area in which this pattern is evident is in the approach to the case work. The LPN students began by fairly systematically listing the information which the scenario provided, in a “here’s what we know now” fashion. Their second step was to try to understand the patient’s situation. They drew upon the scenario information and their recall of learning or experiences, and used nurse-thinking to work their way into explanations and interactions. Then they listed actions to be taken. Of course, the work was done in conversation so it was much more recursive and meandering, as discussions always are, than a strictly disciplined list. But that was clearly the underlying pattern. By contrast, the RNs combined
the three steps (what do we know, understanding, and actions), often beginning by using nurse-thinking to understand a particular aspect of the patient’s condition.

Another instance of these contrasting patterns is found in the care plans which students created. The RN students included case management, whereas the LPNs were more likely to focus on direct patient care. An illustration is found in their choice of language. The LPNs spoke of doing a “head-to-toe” assessment which implies attention to physical factors, while the RNs mentioned a “holistic” assessment which implies broader attention to psycho-social and spiritual, as well as physical, factors. Sometimes the LPN approach led them to include factors not relevant in this particular case (e.g., a chest assessment and possible need for oxygen in Scenario A); other times it served them well in helping them avoid serious omissions. Some indirectly applicable areas were nevertheless reasonable to consider for an older person who has had a stroke (skin breakdown, range of motion, bowel routine and function, signs of stroke).

In areas such as case management, discharge planning and mental health, the LPNs were somewhat limited in how far they could go. They did not show ability to modify approaches when dealing with more complex situations (e.g., using nursing diagnoses, dealing with medication interactions), but they were effective with carefully attending to basic issues.

The approach taken by RPN students had aspects shared with the approaches of each of the other two types of nurse. With Scenario A, the RPNs had a number of questions to ask before they could get started. One group in particular had some uncertainty about the nature of the task and also observed, as other students did not, that it was difficult to know how to proceed until additional information was available. This same group established two clear goals; in order of priority they were to stabilize the patient, and to deal with his confusion. The first priority was completely appropriate, whereas the second was less so. This patient’s problems are physical and it is probable that when his fever and infection are dealt with, his confusion will clear up; the students appeared to be only partly aware of that, as they still set this priority. Their subsequent work on the case was directed toward meeting their two goals, so it was a relatively organized approach, but it did not completely address immediate physical needs. The RPNs also gave more attention to the patient’s potential level of independence on discharge than they did to nursing interventions during hospitalization.

With Scenario B, the RPN students’ approach was structured and systematic. This was particularly evident in the case of one group. This group’s care plan included the usual three parts of prevention, treatment and rehabilitation. They opened by saying immediately that the problem was “probably schizophrenia;” while this was a leap made before they had worked through the case, it was a useful beginning since they were careful to include the word “probably” and since they were right about the schizophrenia. The RPNs approached the task similarly to the LPNs: first iterate the information given, including the patient’s mental health history and prescribed medications, next seek to understand the case, and then prepare a plan of care. However, the RPNs did not adhere to this pattern as strictly as the LPNs did; also for the RPNs the middle step of working at understanding the case took the form of making a nursing diagnosis, with some recall from their experience and a few actions included.

In summary then, similarities were apparent amongst the three types of nursing students, particularly their awareness of the concept of “plan of care” and the importance of having such a plan for a patient; further similarities are discussed in the following sections.
However, there were also notable differences in the way in which the different types of nurse approached the task of preparing a plan of care, with the LPNs being very systematic in following a learned pattern, the RNs moving more directly to what they saw as critical in a particular situation, and the RPNs using aspects of each of these two.

**Thinking Patterns**

As described earlier in the Methods section, evidence of various types of thinking emerged from the data:

- Reading or referring to information given
- Looking up
- Recall
- Nurse-thinking
- Generative thinking
- Speculation

The RN students’ work on Scenario A showed a fairly consistent thinking pattern, with some subtle but significant differences amongst the groups. The shared pattern was: recall the outline of a plan of care, seek to understand the patient’s condition by addressing one issue at a time, use nurse-thinking supported by recall and by references to the case, and include more nursing interventions as they got further into the case.

However, there was noticeable contrast between the weaker and stronger groups of RN students. ['Stronger' means that the students' work showed more depth, appropriateness, accuracy and completeness than did the work of ‘weaker’ groups.] When a weaker group was working at understanding the case, they tended not to use nurse-thinking, but to offer their interpretations as statements of fact, unsupported by evidence. Their consideration of a particular issue was usually fairly brief. When discussing prostate issues, they relied on information given in the case and on recall, but were uncertain what “PSA” means and generally did not know how to proceed, so said little about the matter. Notably, on this particular issue they did not engage in nurse-thinking. Similarly, another group’s consideration of the medications and their interactive effects consisted of looking up information on drugs and doing a bit of recall and speculation, but nothing further. By contrast, the stronger groups used problem solving: stating the issue facing the patient, drawing on relevant prior knowledge, doing nurse-thinking, backing or refuting their ideas by recall or by citing information from the case, doing more nurse-thinking, in a recursive pattern until they considered they had figured out a particular issue. When an issue (e.g., diabetes, UTI) was raised, the students sought to explain it—what was causing what, why the physician gave particular orders, the implications arising, etc. This more thorough approach made it more likely that they would also see relationships and connections and interactions amongst issues.

When nursing interventions were being considered, weaker groups might offer actions to be taken, but without support, whereas others combined suggested actions with the nurse-thinking that either led to the naming of a reasonable action or gave the rationale for the proposed action. There was also a difference in the thinking patterns when RNs were unsure about the appropriate actions to be included in the plan of care. Weaker students’ talk became a scattered list of topics mentioned briefly with sometimes unwarranted speculation about what the patient might experience or need, some recall of what they already knew (e.g., about assisted living or the frequency of eye examinations), perhaps a
few suggested actions, and some nurse-thinking that to a limited degree linked the various
issues. A more able group, when unsure about actions to offer, engaged in quite
systematic nurse-thinking to explore the issue but refrained from unwarranted speculation.

The RN work on Scenario B was very similar to what has just been described, with two
exceptions. Firstly, one group approached the case almost in reverse order. They began by
suggesting actions, using nurse-thinking to justify them, and were halfway through the
discussion before they sought to understand the care already given using reference to the
case, looking up drug information and doing some logical reasoning. So more actions are
found earlier in the discussion than later, actions tend to be stated first followed by
justification (rather than reasoning their way through to action), consideration of the
treatment the patient has already received is in the middle of the discussion, and there is
much less reference to the scenario than usual.

The second exception is that, although Scenario B was in some sense less complex than
Scenario A with fewer interactive effects, the RN students nevertheless were more
tentative in Scenario B. The main issue in this case is the patient’s schizophrenia. Some
groups recognized that quickly, others continued to debate whether he had depression,
personality disorder or schizophrenia; one group realized immediately the interactive
effects of the drugs given, another never quite grasped that relationship. But even those
who gave evidence of understanding remained very circumspect, proposing fewer actions
than in Scenario A and using less nurse-thinking.

Earlier it was noted that the LPN students tended to be consistent in their approach to the
task of preparing a plan of care. Similarly, there was consistency in the thinking patterns of
LPNs; this was so both across scenarios and across groups of LPNs. They started each
discussion with looking up drug information and much repeating, either quoting or
paraphrasing, of information given in the case. Reiterating seemed to be a way of
comprehending the case and sorting out what they knew. Gradually, more nurse-thinking
was included as students moved into analysis of the case, with reference, recall and
speculation all included to a lesser degree. However, in this second stage the references to
the scenario were not necessarily given to support the analysis being made, but were
much more frequently non-sequiturs, as students appeared to be saying aloud something
they had just noticed or were puzzling over or they were casting about for ideas. Similarly,
recalls were occasionally drawing upon prior knowledge, but were often students struggling
to remember something or stating what they did not know, or disagreeing with each other’s
recall. The speculations varied from very plausible to unfounded. Also, the nurse-thinking
utterances were a mix of moving forward in understanding and casting about uncertainly.

With Scenario B, the LPN students were more effective in addressing the patient’s physical
condition than in dealing with his mental illness. This difference is revealed both in the
content of their talk and in the thinking patterns used. When they were discussing the
psychotropic drug effects and inter-relationships, they relied heavily on reference to the
scenario and looking up drug information. They did not move much beyond information
given and did not use nurse-thinking to reason out exactly what was happening to this
patient as a result of the prescribed medication. They were also either very tentative or
silent about explaining his mental state. When his physical factors were considered, there
was much more nurse-thinking and the thinking was better supported by evidence.
With both scenarios, the LPN talk about discharge planning was tentative (“maybe…”) and accordingly was a mix of nurse-thinking, reference, recall, and speculation. The students expressed more concerns than actions.

The RPN thinking pattern was to consider the patient’s mental status first and his physical condition second. They did this with Scenario B in which mental illness is the critical issue, and with Scenario A in which physical illness dominates. With Scenario B they began with mention of schizophrenia, which suggests they were using nurse-thinking and recall as they read the case. However with Scenario A, the thinking was more speculative, less grounded in the information given, and less accurate.

The RPN work on Scenario A began with considerable nurse-thinking, some recall and little or no reference to the case. The patient’s problems in this scenario are primarily physical, although he also has some cognitive confusion. One group began by using nurse-thinking to discuss whether the confusion is caused by delirium, depression or dementia. This talk was a mix of very accurate (e.g., given his fever, this is most likely delirium) and misguided (e.g., he probably has a long history of poor control of his diabetes, whereas the HbA1C test indicated otherwise). The other RPN group began with nurse-thinking about both physical and mental issues. They had completed a suicide prevention workshop only a few days earlier, so it was fresh in their minds and perhaps had undue influence on their thinking. Both groups demonstrated immediate interest in the mental issues, but both also recognized that physical issues were critical here.

In Scenario B RPN students relied very heavily on recall. As the critical issue in this case is mental illness, they had relevant study and clinical experience to bring to bear, and they used recall more than in Scenario A and more than any other group of student nurses. Basically, it appeared that they used recall because they could; it served them well in this instance.

The RPN students working on Scenario A used nurse-thinking in seeking to understand the case, determining goals and discussing nursing interventions, with small amounts of recall and reference to the case, and even smaller amounts of looking up information. But the quality of the nurse-thinking varied from accurate and productive to the opposite. Sometimes it advanced their understanding and their decisions about actions; other times they seemed to be casting about and the nurse-thinking was a search for ideas or an expression of what they did not know.

Another way of considering the thinking done by the nurses is to examine each form of cognitive activity and its usage.

Looking up: This pattern was not used heavily, and was obviously for the purpose of learning or verifying drug information. Thus, it reveals something about the extent of drug knowledge students held. The LPN students did the most looking up and did it for both scenarios. The RPNs checked almost nothing for Scenario B as they were familiar with the psychotropic drugs mentioned; with Scenario A they demonstrated much less familiarity and occasionally did not check something they should have. The RNs were the most efficient, in that they did not check a drug they were familiar with, but quickly checked if unsure. They were familiar with the medical surgical medications, and almost as much so with the psychotropic drugs.
Recall: This pattern also reveals the extent of knowledge, in that one cannot recall what one has not learned. Recall was used most extensively by the RPNs working on Scenario B and the least by LPNs working on Scenario B.

Reference to information given: The LPN students began their work by reviewing together the information given, and they also referred back to it as they prepared their plan of care. So they used this pattern more than the other types of nurse. They used it in three ways: to review the case together at the beginning, along with looking up any drugs that were unfamiliar to them; as support for an interpretation or conclusion they were reaching; and when they were struggling, they used it rather randomly to mention any particular item they happened to notice or wonder about, even if this item was a non-sequitur in the discussion at the time.

The RPN students made limited use of reference back to the case, but used it briefly in three ways: one group used it only to identify the next issue to be discussed; the other group used it to check something; otherwise it was used as part of the flow of talk.

The RN students also made limited use of reference. The primary purpose was to support or refute an idea that had arisen in nurse-thinking. One group did not use it at all. The group that used it most, though still to a limited extent, did so as part of seeking to understand the case and when they were struggling with what to do about prostate problems and did not know what more to say.

Nurse-thinking: “Nurse-thinking” is a critical pattern in examining the extent of knowledge held and the ability of the student nurses to bring their learning (knowing what) to bear on the nursing tasks at hand (knowing how). The quality and quantity of talk have to be taken together, as it’s possible to have, for example, nurse-thinking that is lengthy but inaccurate, or short but concisely accurate and relevant.

The two RN groups whose work showed the most accuracy, completeness, depth and appropriateness in dealing with the complications of Scenario A engaged in nurse-thinking that was both lengthy and productive, leading to a sound explanation of why the patient was experiencing problems, how those problems interacted, and the effects of the prescribed treatments. These groups offered the strongest examples of good quality nurse-thinking. The other two RN groups also used nurse-thinking in Scenario A, but not as much, nor as productively. With Scenario B, the RNs also used nurse-thinking effectively, although to a lesser extent than with A—possibly because there was less to figure out about the case.

It seems important to note the effect of uncertainty on the kind of thinking done. All groups when uncertain, fell back on referral to information given, repetition and some speculation. That is, when they were unsure, there was less nurse-thinking. If they were really puzzled or stymied, there was very little or none at all. Nurse-thinking is basic to practicing nursing; it is an essential professional tool. Without it, a person cannot function as a nurse. So the extent and the quality of the nurse-thinking present becomes one way of seeing the depth of knowledge and quality of work.

Thus, the LPN students used nurse-thinking effectively in discussing care of the physical wounds of the patient in Scenario B, but very little in regard to his mental condition. The quality of their nurse-thinking was better in Scenario A, but still limited, as they showed
understanding of a number of particular factors, but less understanding of the interactions involved.

The RPN students provided an interesting variation on this same pattern. As previously noted, with Scenario B they certainly used some nurse-thinking, but in more limited amounts, because they had strength in the area of mental illness and could rely so heavily on recall. However, their nurse-thinking was to the point and moved them forward in the task of preparing a plan of care. So it was a limited amount of nurse-thinking, but high quality and arguably as much nurse-thinking as was needed. By contrast, with Scenario A where they were less knowledgeable, they used a considerable amount of nurse-thinking, but were not effective with it. They made false starts, or they simply cast about for explanations they could reach partially but not completely enough to understand fully the patient’s situation and be in a position to identify all the nursing care needed.

Thus, high quality and quantity of nurse-thinking was demonstrated particularly by two RN groups working on Scenario A; high quality by RPNs with Scenario B; reasonable quality and quantity by RNs for Scenario B; high quantity but low quality by RPNs with Scenario A; modest amounts of quality and quantity by LPNs in both scenarios with Scenario A being somewhat stronger than Scenario B.

_Generating actions_: While the term “generative” can be used to refer to innovative thinking or the generation of new and novel ideas, that is not the meaning used here. In the two scenarios, student nurses were not expected to generate breakthrough ideas or create nursing innovations; rather they were asked to indicate what care they would provide for two patients with conditions that practicing nurses may encounter at any time. Their knowledge then is revealed by the extent to which they suggest the actions that competent nurses would take in the same situation. This is critical: the actions a nurse takes or omits affect the patient’s well-being.

Clearly, this category is closely linked to nurse-thinking. The higher the quality of the nurse-thinking, the more likely that the actions will be appropriate. Because of that close linkage this category is somewhat different in kind from the other thinking patterns; however, it is a necessary inclusion here as it indicates the practical actions to be taken and, in the absence of observation of nurses at work in clinical settings, is the best indicator available of their nursing knowledge “at work”—the extent to which they have, and can bring to bear, appropriate knowledge in a particular instance.

It is reasonable to assume that a professional practitioner would begin by considering what information is available, recalling relevant knowledge, checking (looking up) any information not already in mind but available from another source, thinking about all these factors, and reasoning through to determine actions. Schön’s (1983) work on the thinking of expert professionals showed that indeed this is a standard thinking process. However, Schön found that experienced and expert professionals typically appear to omit stages, to begin quite differently, or to leap to conclusions; their knowledge and experience allow them to act almost intuitively, or at least it can appear that way to an observer. But in fact, their thorough learning and extensive experience allow them to skip consciously or deliberately working through all steps and use their knowledge automatically to reach decisions very quickly. What appears intuitive is the result of much learning and experience. Since the participants in this study were nursing novices, they are unlikely to have reached this expert level, except perhaps for a few very basic nursing actions. Thus, when students named an action before discussing it or reasoning it out, it is necessary to
ask whether this is something they know automatically, or whether they have leapt to an
unwarranted conclusion. For novices, the latter is much more likely. But it is possible that
one student had thought some particular issue through (using nurse-thinking) before
speaking aloud. This is a limitation of any study involving knowledge and thinking; it is not
possible to access thinking directly.

Three sources were available to the students as a basis for determining actions:
knowledge gained through study, experience acquired in clinical settings, and the
reasoning they did using nurse-thinking. Obviously all three intertwine, as any knowledge
(or misinformation) no matter how it was gained becomes part of the basis for thinking
about the patient’s situation and determining actions to be taken. Suggested actions may
be appropriate, harmful, or innocuous but irrelevant and thus inefficient for the nurse and
perhaps stressful for the patient. The actions given may also be incomplete (needed
actions are not identified).

The identified actions are discussed in detail later (see “Proposed Actions”), with attention
to their appropriateness and what that reveals about the level of students’ nursing
knowledge.

**Understanding the Case**

In each scenario students were given information about who the patient was, what had led
to hospitalization, and what tests and treatments had been started since admission. The
students were asked to prepare a plan of care. That meant that an important interim step
was for them to understand the patient’s situation as fully as possible: what had led to the
critical incident, how various aspects of illness were interacting, the effects and side-effects
of the various drugs being administered as well as their interactive effects, what the
prognosis appeared to be for the patient’s immediate future, and therefore what nursing
care was required. In seeking to understand, students were pretty much forced to draw
upon their nursing knowledge using nurse-thinking, supplemented by other thinking
patterns, to reason their way through the case. The knowledge they held or lacked was
thus revealed by how well they made sense of the case.

All students appeared to have learned the pattern of prevention, treatment and
rehabilitation. Most groups approached their task by citing this trio of terms. However, each
scenario began with the patient already admitted to hospital following a critical incident or
acute illness. So those students who tried to start with prevention struggled, whereas those
who recognized that at the moment the patient was needing treatment (rather than
prevention) had better success in preparing a plan of care. Those who recognized that
hospitalization was the treatment phase also then realized that prevention took the form of
putting supports in place to prevent a recurrence of hospitalization. One RN group and one
RPN group wanted to start their plan of care with prevention which took them directly into
discharge planning.

At their best, the RN students did good work [that is, work that demonstrated depth,
appropriateness, accuracy and completeness], but there were significant differences in
knowledge displayed within the RN groups. One group thought it the doctor’s job to assess
for depression, another included doing such a check themselves as part of the care plan.
One group did not differentiate between confusion and delirium; another had that sorted
out. One did not relate urinary problems and the upcoming cystoscopy to prostatitis;
another was clear about the relationship. One group was uncertain of the meaning of PSA
and the related medications, whereas others appeared to understand it. In short, some seemed very well informed, while others either lacked sufficient knowledge or did not consult the scenario carefully enough before deciding upon actions (e.g., in Scenario B, suggesting the patient needed a catheter when his voiding problems were caused by a prescribed medication and would clear up with a change in medication). Particularly with Scenario A which contained a number of interactive effects, weaker RN groups did not make those connections well or see how the various conditions affected each other.

To get a sense of the best work, it may be useful to summarize the work of two RN groups who were effective with Scenario A and showed understanding of the case. Each began with thinking which combined drawing on knowledge, logical reasoning, awareness of interactive effects (both of the illnesses and of the drugs), and generating nursing actions. One group zeroed in immediately on the key issues (infection, delirium, blood sugar levels), and moved on to deal with related matters (HgB, prostatitis, eyesight). They erred in only one particular, that of determining treatment for the patient’s foot problem. They correctly referred to it as neuropathy, but their interventions were those for DVT, a circulatory problem. With this one exception, the group was effective at problem solving.

The other group addressed the breadth of issues involved in the case and drew on a wide base of knowledge from physiology, pharmacology, pathophysiology, and the aging process. They seemed to have a repertoire of nursing experiences which they brought to bear with regard to discharge planning, including home care options and personal directives. They were consistently patient centered, considering options and focusing on both the patient’s and his daughter’s needs. They also erred only with his foot problem, thinking it might be a DVT or stroke effect without recognizing that it was neuropathy and that the problem was in his right foot, whereas the stroke had caused left sided weakness. Overall, though, they did well in considering inter-relationships of issues, of reasoning logically and suggesting realistic explanations and treatments.

With Scenario B there was also variation, although to a lesser extent, amongst the RN groups, each of whom appeared to understand the patient’s medications and their interactive effects. The weakest group made some questionable assumptions (e.g., the patient needs teaching about hygiene, whereas his poor hygiene was due to the onset of psychosis; he needs a catheter when the problem is a side effect of some medication which the physician had subsequently discontinued), while the strongest group used problem solving and reasoning well (e.g., sorting out the significance of low HgB, TSH levels and hyper/hypo thyroidism, and recognizing the history of undiagnosed mental illness).

By contrast, there was more consistency amongst the LPN groups for both scenarios. As previously noted, LPN students began by listing the information given in the scenario and then went through the case a second time seeking to understand it. In that second phase, they struggled to determine exactly what was occurring with the patient, and frequently seemed to be casting about for explanations. For the patient with psychiatric problems, they were particularly uncertain, apparently lacking depth of knowledge and wondering whether his problem was a personality disorder or depression, even though his symptoms indicate schizophrenia or an acute early psychosis. One group noted he was on an anti-Parkinson’s medication but did not link it to a side effect of Haldol, while another group did not understand why his medications had been changed, even though undesirable side-effects were described. Occasional unwarranted assumptions were made (e.g., because the young man with psychosis had attacked a group of boys, students concluded he would
The LPNs were more comfortable with Scenario B patient's physical health problems than his mental health problems. In particular they addressed the assessment and care of his cast, and his wound dressing, along with managing his arm pain.

The LPN students were more effective in dealing with the elderly patient in Scenario A and overall addressed his problems and suggested reasonable care. They made some sensible connections, such as noting that when the antibiotic took effect his confusion and blood sugars would probably normalize. However, even in this case they struggled somewhat to understand fully (e.g., minimizing the symptoms in his right foot which were actually rather serious) and their reasoning was sometimes inaccurate (e.g., suggesting monitoring glucose and ins and outs to prevent infection when he already has urosepsis; suggesting that his agitation is due to poor sleep when the infection is causing agitation and confusion). One group preceded each patient problem with the phrase “He is at risk for...” This did not serve them well as they then stated that he was at risk for problems he already had. Overall, their efforts to understand the patient’s condition indicated limited knowledge, but they nevertheless did suggest reasonable care.

LPN students appeared to have silos of knowledge that address client needs. Either their use of terminology or the linkages amongst terms tended to be weak, and the links between silos were sometimes correct and sometimes not (as illustrated in the previous paragraph).

RPN students displayed greater understanding in Scenario B which focused on mental illness than in Scenario A which dealt primarily with medical issues. They recognized that the underlying problem was probably schizophrenia; while they suggested other possible causes, such as that his sleep problem might be apnea, they were quite straight forward in saying that it was more likely related to schizophrenia. They had considerable familiarity with the medications in Scenario B, and were better informed about them than the other two types of nursing student. They promptly recognized the patient’s potentially serious reaction to Haldol, grasping this more quickly than did the RN students, although RNs also realized it. They also recognized the side effects of the drug given to counteract the Haldol, which the RNs did not. One RPN group in their discussion of schizophrenia also suggested group therapy, relaxation exercises to assist in falling asleep, establishing a hygiene routine for the patient, and the question of adherence. Clearly adherence after discharge is a real concern, but the other suggestions are only somewhat relevant. However, this may have been mostly an effort on the part of students to be comprehensive.

One RPN group focused on the patient's more minor physical problems, discussing his dressing change in unnecessary detail. They also expected this young man to need more physical care than was necessary (e.g., a daily bath). The other RPN group wondered what ‘epistaxis’ meant; someone asked the question a couple of times, but the group did not deal with it and the question was dropped. Both groups thought this young man who had lost some weight but still weighed 90 kilograms needed a high calorie diet or Ensure. These examples suggest the RPNs knowledge of the mental health issues is strong and their knowledge of medical issues is less so.

This lack of knowledge of medical aspects of care on the part of RPN students was also evident in Scenario A where their work reflected partial understanding that either was incomplete or was combined with less accurate or less appropriate suggestions. Whereas in Scenario B the RPNs were confident about the medications and did only a small amount
of checking, with Scenario A they were less sure (e.g., about Metformin and its uses). One group considered that the patient’s mental confusion was probably delirium and therefore would clear up when the infection had been dealt with, but at the same time they recommended a psychiatric consult; they did not seem aware of the possible contradictions in what they had just said. They also recommended education on how diabetes and alcohol do not mix; at best this was premature, and it was probably unnecessary as the patient did not have a history of drinking beyond an occasional social drink. One group discussed the patient’s pain management but they seemed to miss the point that the pain was caused by not voiding and that emptying his bladder would relieve it. The other group thought his diuretic medication meant he would not need to have his residual urine checked; however this is not the case as his enlarged prostate caused his urinary retention.

The RPN students recognized that the patient had a fever and spoke of how they need to keep him cool, clean and dry, but criticized the physician for not putting him on acetaminophen and missed both the fact that the doctor had taken him off it and why. Much later in the discussion someone wondered whether his stroke might have been hemorrhagic and they reconsidered the appropriateness of acetaminophen. They were the only group to consider the type of stroke the patient had had and how that was relevant to his present status. One group suggested that until they knew if his right foot problems were caused by DVT or diabetic neuropathy they would be cautious about mobilizing him; while it is most likely he has diabetic neuropathy, this cautiousness is not inappropriate. The RPNs were stronger on possible living arrangements and available community services than they were on understanding the patient’s condition while hospitalized.

The RPN students’ knowledge of mental health issues was the strongest among the three types of nursing student. They were able to grasp issues and reach conclusions more quickly than the RNs. The LPN students were quite uncertain about the psychiatric problems in Scenario B. The RNs’ knowledge of medical care issues in both scenarios was the strongest among the three types of nurse. The LPN students’ knowledge was less extensive than that of the RNs, particularly in making connections and seeing interactions, but they had a sound foundation of knowledge and did not make critical errors. While the RPNs and LPNs demonstrated satisfactory knowledge of the medical aspects of care, both groups did this less effectively than the RNs.

The extent of the knowledge shown varied, not only amongst groups, but amongst individuals within a group. In the scenarios the stronger students led the weaker ones. In one RPN group, one person did not know what “DVT” meant and another supplied the information; one person thought the patient should not be on Metformin and another explained; one person said there was no indication of when to administer insulin and another noted that the physician had ordered sliding scale. This process of working as a team and supporting each other showed collegial respect and good teamwork, and is to be commended in a situation in which students had been directed to work together; however, in clinical settings it is probable that a nurse would have to work more independently and could not rely on colleagues being available to shore up information or correct misinformation, and in that sense is a matter of concern.

The task of fully understanding a patient’s condition proved a challenge for all students and gave helpful insight into their depth of nursing knowledge. Ability to use nurse-thinking effectively and ability to understand are very directly related.
Reading Lab Reports

In Scenario A it was not possible to understand the patient’s situation fully, nor be comprehensive in his proposed care, unless the students paid attention to the lab results data they were given as part of the case. Lab tests of particular importance for this elderly man were: UTI related tests (WBC and urinalysis), and those related to his diabetes (FBS, Glucometer, HbA1C). Thus, attention was given to references they made to those tests to see what the three types of student appeared to understand or be puzzled by, and how they used the test results or failed to do so.

While all three paid attention to the lab results in Scenario A, there were some differences in the groups within each type: one of the two LPN groups and one of the four RN groups paid little or no attention to the lab reports, thus immediately limiting their ability to thoroughly understand the patient’s condition and propose appropriate actions. Both RPN groups paid some attention to the lab reports.

The LPN students spent more time figuring out what the lab results meant, while the RNs and RPNs spent more time using the results to explain what was happening to the patient and what should therefore be done. For example, one group of LPNs wondered what the ‘N’ beside a test results meant, and after quickly settling that, they wondered whether in clinical setting lab reports include normal as well as abnormal results. In contrast, the RPN students suggested they send a stool sample for occult blood as his hemoglobin was continuing to drop. The RNs reflected on the patient’s hemoglobin, drawing on their past experience to anticipate at what point a blood transfusion would be ordered.

While all three types of student discussed tests that were not all that relevant to the patient, the RNs and RPNs were more likely to focus on those lab tests which were more critical for this patient (blood sugars, E.coli in urine, HbA1C, WBC).

One or more of the LPN and RN groups left out one or more lab tests of significance. For example, the LPN group that paid little attention to the patient’s lab results did not address glucometer results and the need for insulin, nor the HbA1C results. This group also thought that urinary retention leads to electrolyte imbalance which is not the case. Two of the RN groups did not address the HbA1C test. While RPN students did not omit the important lab tests, they discussed them in less detail than did the RNs. For example, related to the patient’s hemoglobin, the RPNs indicated it would be up to the physician to decide whether he needed a transfusion, while the RNs drew on their past experience to anticipate at what point a blood transfusion would be ordered.

All three types of students recognized that the patient’s UTI (as evidenced by WBC) and blood sugars (as evidenced by FBS) were both related to this elderly man’s confusion, a fact of importance to meeting his immediate and long term needs. They also realized that once his UTI was gone and his blood sugars were back to normal his confusion would likely clear up. However, some groups assumed this would not happen, suggesting he would need to move to a nursing home or be referred to a geriatric psychiatrist. All three recognized that the patient was on sliding scale insulin, but none seemed to realize that he would have been given insulin on day 1 and day 2.

It appeared that all three types of nursing student knew little about HbA1C, or at least not enough to recognize its significance and take it into account: numerous times the groups assumed the patient’s diabetes was out of control prior to his acute illness, when in fact his...
HbA1C suggested otherwise. However, one RN group realized that because the results weren’t ‘flagged’ his diabetes must have been reasonably controlled. One LPN group debated the results and, though they knew what it measured, they did not link it to the patient’s home management of his diabetes. The RPNs knew the purpose of the test but not the normal values, so they brushed it aside.

All three types of nurse stumbled over the PSA test. Some did not know it was related to the prostate, and those that did knew little else about it.

Lab tests for the patient in Scenario B did not play as large a role in understanding the patient’s condition or his care. However, attention was paid to references students made to the patient’s elevated WBC and purulent discharge from his laceration.

All three types of nursing student recognized the link between the patient’s elevated WBC and his infected arm. LPN and RPN students did not give further attention to these tests. RNs did explore this a bit further; for example one group wondered if any of the patient’s medications could cause elevated WBCs, and another suggested that trauma and surgery can elevate WBCs.

In summary, this discussion of how the three types of nursing student deal with lab tests suggests that LPNs, RNs, and RPNs are attuned to the importance of lab tests in patient care. It also suggests that while LPNs attend to lab results, their more limited breadth and depth of knowledge means they are less able to deal with the complexities of the various lab tests and their potential impact on patient wellbeing. That said, it is likely the LPN students will pick up on key issues and observations, referring them to the appropriate person as needed. The RN and RPN students are more likely to use the lab tests to help them understand what is happening to the patient and ultimately plan the patient’s care. RNs in particular gave evidence of using this information in greater depth and of recognizing the implications of the tests for the management of the patient’s care.

**Proposed Actions**

The task the students were asked to undertake was to prepare a plan of care. That necessarily included naming actions they or other professionals would carry out. Actions can be helpful to the patient, unnecessary, or mistakes. There was very little, if any, unsafe action proposed. Some unnecessary steps were suggested, but most were appropriate. Omitting necessary actions was more of a concern. Another matter for comparison was the specificity of the proposed actions. Sometimes suggestions were too vague; for example, “clear up the infection,” with no indication of what they as nurses would do to achieve this result.

As part of the analysis of students’ work, their proposed actions were sorted into six categories; each is discussed below.

**Assess and monitor:** Due to the complexities in Scenario A, along with the interrelationships among some of the problems, there are a number of key assessments to consider: confusion and if that changes when the patient’s UTI is dealt with, diabetes management, right foot symptoms, his voiding problem, how his stroke affects his independence, and how he will manage at home. In Scenario B there are two types of key assessments: those that focus on his physical health problems (broken arm and laceration), and those focusing on his mental health problem (response to medications and
adherence). As the patients in both scenarios had on-going conditions that change over time many of the suggested actions naturally fell into assess and monitor.

Of the various kinds of actions nurses might carry out, the students most frequently named assessment and monitoring. This was so for each type of student. They consistently started with assessment, clearly a learned pattern. Assessment is an action, and it may be a necessary precursor to appropriate treatment, but it is not itself a treatment (as some students seemed to think). When an assessment has been made, no actual care has been given. However, assessment is a logical place to begin, and each group included it.

The three types of student nurse included reasonable breadth of assessment actions, and while they did not make serious assessment omissions or errors, they varied in their ability to discriminate key assessment areas and the degree to which they did this.

In Scenario A both LPN groups included items not directly relevant to this elderly patient’s current situation: chest assessment and the possible need for oxygen, abdomen, bowel sounds, skin breakdown, and range of motion. While the list of assessments for Scenario B was not as all encompassing some items were also not directly related to the patient: for example intake/output and weight. As mentioned earlier, this suggests the LPN students may have been working from a learned head-to-toe assessment format. One LPN group spent considerable time discussing the frequency of monitoring vital signs for both patients. Even though the LPN students occasionally got bogged down in very specific details, they were taking basic but important patient needs into account.

The RN students were more focused and discriminating in what they assessed in both scenarios. Rather than a using a set format, they focused on key assessment points related to specific patient issues. For example in Scenario A they would ‘ask his daughter about his usual sleeping patterns (‘Maybe he’s never slept well’) and in Scenario B they would assess the ‘family knowledge of mental illness and educate to fill in the holes.’ These examples suggest the RNs may be taking more of a case management approach to assessment.

In some respects the RPN students were also focused and discriminating in what they assessed, particularly related to the patient in Scenario B. For example, of the three types of nurse they were most likely to assess the effectiveness of Cogentin in overcoming the side effects of Haldol. However, they did not recognize the need to monitor the patient’s temperature, which along with rigidity is one of the first symptoms of serious neurologic disturbances that can occur with medications such as Olanzapine. In Scenario A their assessment of confusion was more detailed than the other two types of nurse: persistence, time of day and other patterns. However, they also were more inclined to include assessments not directly relevant to the patient’s situation: for example one group included bowel function, stool for occult blood, and alcohol levels. In Scenario B this group included daily blood pressure check and intake and output measurement. Only one RPN group considered how the Scenario A patient’s independence was impacted by his stroke; no LPN or RN group included this assessment.

These assessment data suggest that while all three types of nurse are likely to address key aspects of patient assessment, there are notable differences in how they go about it. LPN students used a learned set format when assessing patients. The RN students on the other hand took more of a case management approach to assessment. The RPN students’ assessment strengths were evident in assessing the mental health issues. It appeared their
assessment of physical health problems was less discriminating than those of the RNs. While they focused less on unnecessary details than the LPNs did, they also focused a little less on necessary particulars of physical health issues.

**Direct patient care:** The direct patient care required by the two patients varied notably. As would be expected, the patient in Scenario A, an elderly man with more than one health problem (UTI, confusion, uncontrolled diabetes, diabetic neuropathy), required more direct care than the young man with a mental health problem (schizophrenia), a fractured arm and purulent wound drainage. All three types of student nurse placed more emphasis on assessing and monitoring than they did on direct patient care. For Scenario B this was largely appropriate, but not so for the patient in Scenario A.

In Scenario A the LPN students included direct patient care actions related to such things as his infection, his safety, his problems sleeping. Most of these actions were quite specific; for example, safety measures included using side rails, having the call light within reach, and using a wheelchair. Promoting regular sleep patterns included: relaxation, comfort, and no coffee in the evening. LPNs did not address managing his leg pain, his diabetic diet, or promoting his independence.

Many of the RN students’ direct patient care actions in Scenario A were broader in scope than those of the LPNs, reflecting more of a case management approach (get medications stabilized; deal with depression and memory loss) than individual specific actions (administer medications; orientate to person, time and place). The RN students also included more specific care actions: safety measures (side rails, assistance to ambulate), managing his leg pain (medication, counselling, education, exercise), independence and socialization, mobilization (up in a chair, walking to bathroom with assistance), replacing Ativan with hot milk if he’s not sleeping, and helping him get a personal directive in place. One RN student commented: “It’s a continuous process: follow doctor’s orders, carry out interventions, and assess lab results – the whole nursing process.”

The RPN students’ direct patient care actions for the Scenario A patient were rather limited. They included encouraging fluids, preventing bedsores (keep him cool, clean, and dry), elevating his feet, and giving him a diabetic diet. They also included promoting as much independence as possible, and having him do things on his own even if they take a long time. The RPNs did not include any actions pertaining to the patient’s safety, his problems with his right leg, or his voiding problems.

Three additional points need to be made about the direct care actions. While all three types of student nurse addressed care actions pertaining to mobility and safety, none articulated how challenging this would be for someone with left-sided hemiparesis, diminished eyesight, and peripheral neuropathy in his right foot. Second, all three types mentioned elevating and positioning the patient’s right foot to promote circulation. While this is not inappropriate, this action most often seemed founded in a belief that he had a deep vein thrombosis rather than peripheral neuropathy. That said, a few groups stated or inferred they needed to clarify the problem underlying his right foot. Finally, all three types recognized that the patient was on sliding scale insulin, but none seemed to realize that on day one they would have called the doctor for an insulin dose, and on day two they would have given him 6 units of insulin.

The LPN students direct patient care actions in Scenario B were the most limited in scope and were a combination of some that were quite appropriate to the patient (close
observation; dressing changes) and others that were not. For example, they would address his need for safety by using side rails, a transfer belt, and a one person assist with ambulation—actions not well suited to a physically healthy young man. They also suggested Ensure to help him gain weight, again, not needed by a physically healthy young adult. They had some specific actions for cast care: moving his fingers and having him maintain his strength by gripping a stress ball.

The RN students’ direct patient care actions in Scenario B were more comprehensive and appropriate to a patient with a mental health illness (close observation and safety for the patient and the staff; pain relief for his fracture and lacerations). A few actions reflected more of a case management approach (stabilize his medications; get a diagnosis from a psychiatrist, and adherence with his medications). Others were rather vague, such as, ‘treat the pain’ and ‘try to get his cooperation.’

The RPN students’ direct patient care actions for Scenario B were quite comprehensive and appropriate. Those addressing his mental illness reflected their more extensive experience with mental health patients (‘first stabilize the patient’; staff safety; medication adherence). For adherence they included ensuring he takes his Olanzapine and that he’s not ‘cheeking his meds’ when they are given to him. They also included: assisting with his hygiene, establishing a routine, and encouraging him to get up slowly (to prevent dizziness). These students discussed at length the frequency of dressing changes and what products to use, and noted that later he would need to have his sutures removed.

In summary, in Scenario A the LPN students were more likely to focus on details, while the RN students’ focus included both detail and broader case management issues. Although the RPN students noted some relevant care actions, their treatment of this patient’s direct care needs was very limited. All three types of student nurse missed three important care points: the impact of his multiple problems on his mobility, the severity of the problems with his right foot, and the fact that he needed insulin on two days. In Scenario B, the LPNs direct patient care actions were limited in scope with a number being inappropriate for this young physically active adult. The scope of the RNs direct care actions was reasonable and while some were vague, others reflect a case management approach. The scope of the RPNs’ actions was also reasonable and their more extensive experience with psychiatric patients was evident.

Patient and family teaching: In both scenarios the LPN students’ teaching actions included relevant points. For example, in Scenario A they would teach the patient about his upcoming tests and how to check his glucose; in Scenario B they included medication teaching, and teaching the family about his diagnosis. While these actions lack specificity, they are important teaching points. However, they omitted a number of important teaching issues. In Scenario A they did not include the daughter nor did they address how the patient’s state of confusion would impact teaching. In Scenario B they did not include the teaching about medication adherence once the patient is discharged.

While the RN students included patient/family teaching in both scenarios, their patient teaching actions were much stronger in Scenario A than Scenario B. In Scenario A they appeared better informed than the LPNs about diabetes and were more thorough in what they would teach both the patient and his daughter. Their teaching points addressed diabetes management, signs and symptoms of infection and what to do about them, signs and symptoms of hyper- and hypo-glycemia and what to do about them, foot care, and coping with depression. They noted that patient teaching would need to wait until his
confusion had cleared. They also addressed teaching the patient about medication adherence and insulin administration. As the patient had been taking his medications thus far, and until his UTI developed had been non-insulin dependent, this teaching may not be needed, though these are still relevant points to include. They did not include teaching about what to do if urinary retention recurs. In Scenario B their patient teaching actions were limited and often vague: ‘educate patient about hygiene,’ ‘educate both patient and family,’ and ‘how to handle voices and when to seek help.’

The RPN students’ patient teaching actions for Scenario A included these items: alcohol use and diabetes, diabetic diet, medication adherence, depression (if he has it), stroke prevention, and exercise. They also included teaching the daughter and the patient about delirium and dementia. While these points are relevant, students were less specific and inclusive than the RN students. RPNs also noted that patient teaching would need to wait until his confusion had cleared. They did not include teaching about what to do if urinary retention recurs. In Scenario B the RPNs included teaching him how to sit up slowly, activities of daily living (ADLs), the issue of living at home with an abusive father, and living arrangement options. It should be noted that whether or not his father is abusive is unsubstantiated. They also included teaching the family ‘how to handle the situation’ and both the patient and family about his ‘psychotic break.’ They did not include teaching about the importance of medication adherence; eliciting adherence can be a challenge as the side effects of Olanzapine include weight gain and loss of libido.

In summary, patient teaching in Scenario A was done more effectively by RN and RPN students than LPN students. In Scenario B the RPNs were more effective than the RNs and LPNs.

Communication with patient and family: While communication is an important aspect of direct patient care such actions are difficult to detect in the hypothetical situations posed in this study. That said, all three types of student nurses included communication with the patients and families in their discussions. These actions were often stated quite generally, for example, ‘assess his communication skills’ and ‘establish rapport.’ Examples of more specific actions included: ‘get feedback to be sure he has understood’ (LPN), ‘talk to him about his supports and his friends’ (RN), and ‘talk to him about suicide’ (RPN). The LPN students’ communication actions in both scenarios tended to be broad, while those of the RNs were more specific. In Scenario A the RPN students’ communication actions were primarily directed to the patient’s daughter; the only one directed to the patient was ‘talk to him about suicide’ (even though there is little reason to think he might be suicidal). The RPN students were the only type of student nurse to focus on the daughter’s perspective; for example, ‘answer her questions,’ ask her wishes,’ and ‘keep communication open.’ RPN communication actions in Scenario B were limited to finding out what has meaning to the patient and reinforcing the things that are important to him.

Referrals and contacts with other professionals: The LPN students, apparently concerned not to miss anything important or neglect something they were uncertain about, were quick to make referrals, especially to the physician. Some of their referrals were very relevant (in Scenario A: notify the doctor, inform the charge nurse; in Scenario B: refer to a social worker to learn more about the family), and some not as relevant (in Scenario A: refer to mental health; in Scenario B: refer to a diettitian). In Scenario A they indicated they would consult with the physician to be sure the IV rate was not too fast; more appropriately they should first check the orders and if needed consult with the charge nurse. In Scenario B they proposed talking to the pharmacist about potential drug interactions; while this is not
unreasonable they might have checked this out on their own first. While this willingness to consult with others is positive and knowing their own limitations was a strength of their work, in the last two examples they should have first focused on what actions lie within their scope of practice before bringing in other team members.

In both scenarios the RN students referred to a wide range of professionals. In Scenario A this included psychiatry/mental health, OT, PT, dietary, RT, social work, and a foot care nurse. In Scenario B they named dietary, psychiatry, pharmacy, social work, physiotherapy, relaxation therapy, massage therapy, and the physician. While many of these are reasonable, they seemed to be covering off all possible referrals rather than discriminating those that are most relevant. In Scenario A they also posed some tentative ideas: ‘maybe a grief group’, ‘maybe someone to visit him’, both not unreasonable speculations.

RN students by and large were quick to use the language of advocacy; often their immediate response was to say, “Advocate for him.” For example, in Scenario B they would advocate for the patient to see an OT, a PT, and a dietitian. Though to a lesser extent, the RPN students also brought up advocating. For example, in Scenario A they would advocate for a pastoral care referral. While advocating on behalf of the patient is sometimes required, these students seemed to think that no other health professional would be paying attention to the patient’s needs; in neither case was there any evidence to suggest that advocacy would be needed.

In Scenario A the RPN students identified several appropriate issues they would discuss with the doctor, for example whether the patient has a DVT or diabetic neuropathy. They would appropriately wait until his confusion had cleared to refer him for another vision assessment. In Scenario B they would be sure the patient was referred to social work, an important part of this patient’s care. These appropriate referrals are of a case management nature. Some referrals were less pertinent to the situation. For example, in Scenario A they would refer the patient to a geriatric psychiatrist and in Scenario B they proposed consulting with the dietitian about a high calorie diet.

In summary, the LPN students focused on reporting to others to ensure nothing critical had been missed, and the RN and the RPN students focused on drawing in the professional expertise of others as needed. The RNs and the RPNs tended to take more of a case management approach to their communication with other professionals.

**Discharge planning:** All three types of students were well aware of the importance of discharge planning and the need to start this early in the patient’s hospitalization. The RNs tended to identify discharge planning early in their discussion, revisiting discharge matters in relation to the issues they were discussing. The LPNs and RPNs tended to turn their attention to discharge planning somewhat later in the discussion. As can be seen in the following information, the RN students were more detailed in their approach to discharge planning, particularly for the patient in Scenario A. The RPNs discharge planning actions were more extensive in Scenario B than in Scenario A. Their discharge planning was less detailed than the RNs and similar to that of the LPNs.

In Scenario A RN students approached the patient’s ability to go home reasonably well, often with quite detailed attention to how the various choices would impact the patient, and with consideration of the practicalities of what services, such as Home Care, can provide. They linked discharge planning to particular patient problems, for example the effect of
neuropathy on his mobility at home, or how the patient’s knowledge of diabetes would affect his ability to test his blood sugar and administer his own insulin. There was considerable discussion about whether the patient could go home or would require assisted living. Overall, the students were careful not to rush the elderly man out of his home. In Scenario B the RNs raised discharge planning as something that needed to be done. One group spent considerable time identifying indicators of the patient’s readiness for discharge and another group identified a few discharge goals. This work was less complete than that done in Scenario A and there was much less evidence of linking discharge planning to specific patient problems.

In Scenario A the RPN students considered home care and assisted living as possible living arrangements and they recognized the support the daughter would need. One group talked about the stresses the patient’s daughter would face if he moved into her home and then turned their attention to the specific support home care could give. The other group took a goal-oriented approach identifying key issues that need to be addressed before he could go home; for example, his confusion needs to be gone.

For Scenario B both RPN groups recognized the importance of follow-up for this young man with a newly diagnosed mental illness. They were aware of the adherence issues and very knowledgeable of the kind of community support he would need. One group clearly identified specific conditions of discharge, for example, no aggression and no infection. Both groups discussed his living arrangements quite extensively, debating whether living at home or in a group home would be best. One group thought going home would not be a good idea as his Dad was abusive; at this point this is speculation. This group also speculated about what medications would be best for him which to some extent took them beyond their scope of practice. Some discharge actions were of a case management type, for example, if he is to be discharged next week they need to be sure physiotherapy and cast removal referrals are in place.

The LPN students, when discussing Scenario A, covered some important aspects of the patient’s discharge needs (physical, emotional and social). They were very aware of the issue of sending people home without the right supports and the unfortunate consequences that often follow. They were reasonably tentative about whether or not the patient could stay in his own home and, while they mentioned this point, they did not explore it fully. The LPN students noted the importance of involving his daughter but did not pay attention to what the patient would want. They also made a few assumptions about what he needs to learn about his diabetes, conclusions that were not substantiated in light of his normal HbA1C.

For Scenario B the LPN students’ discharge planning was less effective than for Scenario A. While they recognized the patient’s key discharge needs (medication and appointment adherence; cast care), their discussion was quite repetitive and they did not arrive at any solid recommendations. One group had difficulty going beyond the fact that a discharge plan was necessary.

All three types of student nurse considered the contributions of other health professionals to discharge planning and the role of community agencies in giving post-hospitalization support, although the LPNs were somewhat more tentative about the extent of the support which Home Care could provide. All discussed discharge planning conferences and handled family involvement quite reasonably. All made a few unsubstantiated assumptions, but not in any significant way.
In keeping with the observation that RN students gave more attention to case management and bigger picture matters, they were more complete in their discharge planning. They took into account changes likely to be needed in the client’s home and routines, even as they recognized that they did not yet know whether he would be able to return home. It was a bit of a “cover the waterfront” approach. The RPNs used a case management approach for Scenario B that gave evidence to their expertise in mental health nursing. The LPNs were quite tentative in their discharge planning and did not use a case management approach.
BUILDING A META-MODEL

A goal of this project was to reach beyond the analysis of data gathered about three types of nurse to devise a set of directions, or meta-model, that in turn can be used to develop specific methodologies, on a case by case basis, to compare the knowledge bases of other sets of professions whose work overlaps. For example within health care, interest has been expressed in such groups as pharmacists, physiotherapists and occupational therapists. Stepping outside the healthcare professions, examples of combinations might include groupings such as scientists, technologists and technicians, or school teachers, adult educators, and human performance consultants. Such combinations frequently share common coursework as part of their preparation and have overlapping experiences both in their field preparation and ongoing work requirements.

The development of the meta-model to its present stage was grounded in the process developed to conduct the comparative analysis of the knowledge base of the three types of nurse and evolved in an iterative fashion as represented in Figure 7, below. It would be fair to say that at this point, the meta-model is very much in an embryonic stage. It reflects much of the thinking that lay behind the technical proposal that gave rise to the present project, and its more developed elements (e.g., the development of scenarios to explore the instantiation of professional knowledge bases by young professionals) are a direct outcome of the emphases which emerged as the project unfolded.

Figure 7: Iterative process of meta-model development

Because research comparing knowledge bases is exploratory in nature, there is a leaning in the meta-model toward qualitative methodology which allows some fluidity in the evolution of the criteria for comparison. For example, in the research reported in this study it was found that the original categorization scheme devised to segment and compare the focus group work on the cases simply did not yield useful information to make comparisons. Nevertheless, continuing reanalysis of the transcripts of the casework yielded a modified scheme including the concept of “nurse-thinking” that was very useful in elucidating
commonalities and differences. Adopting a qualitative approach also facilitated developing “work-arounds” in cases where important data were not available, e.g., think-aloud protocols from actual field experiences or documents that were desirable to compare but could not be readily compared due to a lack of common format and language, e.g., scopes of practice.

Another issue which warrants attention is the concept of “useful granularity.” While one might be tempted to assume that greater granularity is always better, such is not the case. Increased levels of granularity consume additional research resources, and if the additional level of detail yields little or no useful information, it is effort largely wasted. On the other hand if one underestimates the level of granularity one may miss useful information. Therefore it is recommended that one begin with the greatest degree of granularity expected to yield useful results. If, in conducting the study, this proves to be the case it warrants increasing the level of granularity on a trial basis. However, if useful results do not emerge the level of granularity should be decreased.

For example, in comparing the academic preparation behind the knowledge base(s) of multiple groups, it may seem desirable to disassemble individual curricula down to the level of lesson plans within courses and make comparisons at that level. However, if the goal is to identify differences, and if there is no evidence of significant differences in the overall content of the course, then it makes sense to work at a level of less granularity and compare the presence and absence of courses in the programs of study—in the present study increasing the granularity would not have facilitated pursuing the key interest of instantiation of knowledge in the workplace. There are two exceptions to this granularity rule. One consists of instances in which the teaching methodology employed facilitates a parallel agenda, e.g., development of problem solving strategies. This is particularly important given that comparative analysis of knowledge bases not only examines “what is known,” but also “how the knowledge is held,” how it is drawn upon and utilized, and how it may be instantiated in the demands of field tasks. A second exception to the granularity rule applies to cases in which a common topic appears in two curricula but the expectations for domain of application differ notably, e.g., in Curriculum A the instructional goal, “understands current approaches to treating kidney stones” unpacks into “when asked on an examination can list four approaches to treating kidney stones” whereas in Curriculum B it unpacks into “uses knowledge of common treatments for kidney stones to select appropriate treatment given patients presenting with particular symptoms.”

It may not be desirable to apply the same degree of granularity uniformly across all data available. In the case of the present study, for example, one goal focused on the potential utility of the findings to administrator decision-making. This in turn led to a methodology which concentrated on actual knowledge bases as instantiated by student nurses rather than “ideal” or “intended” knowledge bases as represented in curriculum and other documents. Hence a finer degree of granularity was applied in parts of the methodology which explored student knowledge than in those which compared documents.

As represented earlier (Figures 4 and 5), a major organizing principle for the models is the notion of congruence. One expects to find a chain of congruence linking the various elements that constitute the knowledge base of one professional group and the surrogates for those elements. (While entities such as scopes of practice and curriculum documents tend to be considered as parts of the knowledge base, they are in fact commonly employed surrogates which are assumed to be representative of elements in the knowledge base itself.) It is assumed that, if there is some inherent unity in a professional knowledge base, one can expect to find that such entities as relevant legislation, scope of practice,
competencies list, curriculum documents, and the knowledge as instantiated by practitioners are all congruent with each other. If they are not (and it is frequently worth analyzing whether they actually are congruent), then this is probably a clue to potential confusion about the knowledge base of that professional group. In the same way in which each pair of elements belonging to a single professional group can be checked for congruence, so it is possible to check for congruence between like elements of different but related professional groups. To the extent that they are congruent with each other, one can assume overlap in professional knowledge. To the extent that they are not congruent, one can assume uniqueness of the one in comparison to the other.

The following guidelines are offered as a meta-model for developing specific research methodologies to compare sets of knowledge bases for related professions. (An important caution here is that these guidelines are with regard to methodology, and do not constitute a research question or proposal; the meta-model is intended to provide guidelines for an approach that can be applied to generate these.)

1. **Identify groups or “types” whose knowledge bases are to be compared, and why there is interest in making such comparisons.** While the identification of “who” is intuitively obvious, spending time analyzing the “why” may not be. The presence or absence of particular goals for engaging in the exercise feeds forward to determine what will and will not be attended to, what level of disaggregation of data should take place, and what can and cannot be a “negotiable” in deciding whether or not to pursue categories of information.

2. **Develop a list of ideal comparators that might guide selection of data sources,** e.g., fields of practice, scope of practice, frequently noted overlaps, points of contention in the workplace, apparent points of difference.

3. **Conduct constraint analysis.** Formally identify what may hinder or even block gathering and analyzing data to make comparisons. Information from this step will feed forward to influence the details of the methodology as implemented.

4. **Given the information gleaned in 1, 2, and 3 above, select sources of relevant information.** The gross classification of academic sources, professional sources, and field sources is a reasonable starting point. These further subdivide into such subcategories as curriculum documents, interviews with academic faculty, interviews with students, scope of practice documents, certification examinations, casework, think-aloud protocols, interviews with practicing professionals, etc. In selecting categories of data some form of constraint analysis is recommended to eliminate sources that may be desired but cannot be accessed. Where information is critical but unavailable, work-arounds must be developed.

5. **Plan for the gathering and analysis of think-aloud protocols from practicing professionals in the course of their daily work as the most appropriate means to capture “know how” data.** Simulations might be substituted as a work-around if necessary.

6. **Plan for the development of hypothetical cases** as an appropriate means for gathering “know what” information, and a limited but nevertheless valuable substitute for gleaning “know how” information. The following recommendations are offered for the creation of the cases:
a. Considered globally, cases should lie within the scope of practice of all types being compared.
b. Cases should be rich in detail, but with sufficient ambiguity to trigger discussion.
c. Different details within the cases should be expected to be salient to different groups.
d. Cases should call for practical action.
e. Cases should be “data driven” but not conclusively so; i.e., they must be rich enough to constitute a “problem.”
f. Adopt a focus group approach to casework since this facilitates discussion, and it is the talk which makes the underlying knowledge explicit.
g. Develop tentative analysis schemes that can be modified as necessary to make sense of the data gathered. Globally one is interested in such matters as similarities and differences in depth, comprehension, and approach, and in any demarcation of boundaries.

7. **Plan for triangulating sources of data**, e.g., focus groups with scopes of practice with student interviews with curriculum documents.

The foregoing represents an approach to generating methodologies for gathering and analyzing information relevant to the comparison of knowledge bases. However, it must be remembered that it has been derived from the methodology developed for a single study. One would expect that there will be further refinement to the meta-model as further studies are conducted and the experience of the researchers is fed into the iterative process of model construction.
CONSIDERING THE IMPLICATIONS

The observations and recommendations following are of two types. First are those that arise directly from the study and are unavoidable logical outcomes of it.

Secondly, studies of this exploratory nature conducted as qualitative research frequently turn up issues and emphases that lie somewhat outside the expected parameters of the research questions. This study was no exception, and some of these incidental findings do have a bearing on the knowledge base of new entrants into the nursing profession in that they influence role perceptions and even misconceptions held by some novices. These in turn influence how the novices contextualize themselves and set personal expectations.

As is expected in this genre of research and has been noted earlier in this report, discussion is limited to the data gathered from the participants in the study, and the implications drawn are similarly constrained.

In the present health care context, it is critical to use nurses’ abilities, skills and potential as fully and strategically as possible. The purpose of the observations and recommendations following is to move toward this goal, while maintaining the strengths inherent in the work nurses of all three types are presently doing.

Confusion occurs around the use of the term ‘nurse,’ and to which health care workers it properly applies. It is sometimes used in exclusionary ways to refer to only one or two types of nurse. Students in the study, while confident about their own type of nurse, apparently felt some ambiguity about their relationship to the profession as a whole. The issue appears to be reinforced by the existence of three different types of credentials backed by three different knowledge bases, which have amongst them both significantly overlapping and significantly different responsibilities.

It is apparent if each type of nurse had the same knowledge base, there would be little reason to have different types. But the student work on scenarios, while showing overlap, also revealed differences. RPN students were strong in the area of psychiatric illness and medication, but less so in medical surgical areas. LPN students were as strong as RN students in knowledge of standard care and standard procedures, but not so with more complex clinical issues. RNs showed the widest range of nursing knowledge, and except for psychiatric areas, also the deepest knowledge.

Quite a number of nurses interviewed, both faculty and students, said that nurses should know each other’s scope of practice, so that they know what to expect of each other and can work together more effectively. Ironically these same individuals also indicated that they personally knew only their own and were unfamiliar with the other two scopes of practice. In the present system there is little incentive for nurses to familiarize themselves with each other’s scope of practice, so uncertainty, misinformation and misunderstandings continue.

There is considerable uncertainty among student nurses about the term ‘scope of practice.’ When asked, some students thought immediately about what they were allowed to do as students versus what they anticipated that their employer would allow or expect them to do when they graduated. Some were also aware of the regulatory documents which determine the breadth and the limits of practice for each of the three types of nurse. (For a fuller
discussion of this point, see White, Oelke, Besner, Doran, McGillis Hall, and Giovanetti, 2008, who found the same confusion amongst practicing nurses).

With regard to the regulatory and practice documents for each of the three types of nurse, they appear to have been written in isolation from each other, using very different structuring, organization and level of detail, and—of particular importance here—without any reference to the scope of practice of the other two types of nurse. So there is no indication within the documents of what is common amongst nurses or unique to one type, and because of the very different forms of presentation, comparisons are very difficult.

Greater ease of comparison across the three scopes would be helpful, for administrators and supervisors, but also for nurses themselves. If nurses, and those working with nurses, knew, or could easily check, which categories of work are authorized for which nurses, and everyone accepted that authorization, considerable progress would be made toward clarity and fuller cooperation. Therefore, one document is needed to show clearly what is common and what is particular to each type of nurse. There appears to be no reason inherent in the knowledge bases for this to be difficult to do.

It would be helpful if each nurse and those administrators directly involved become familiar with the above recommended amalgamated scope of practice statement, so that everyone is clear on what is common ground and what is particular to a type of nurse—and therefore who is needed for particular nursing work.

The novice nurses in this study at times had a bit of difficulty in fulfilling requirements that are within their scope of practice, but they were novices not yet in full practice, and they were clear that they had been taught what they were struggling to sort out ('We should know this…;' ‘I can’t remember…’). So it appeared in this study that nurses are being prepared to their scope of practice.

Significant distinctions among different types of nurse appear to lie partly in major topics studied, but much more in the depth and detail in which topics are studied. (For example, it is possible for several English majors each to claim that they have studied Victorian literature, but one studied only the novelists, another also the poets, a third studied novelists, poets and dramatists but only in brief survey fashion, and a fourth studied major but not minor writers, etc.) This difference in granularity is not easily measured as topics are taught various ways, sometimes once while other times recurring, in isolation or in interconnection, with theory alone or linked to practical application. Further, what is taught is not the same as what is learned so different students in the same class will not have exactly equivalent learning. Hence, very fuzzy boundaries result in the collective knowledge base of different types of nurse.

Sometimes, in an attempt to clarify roles, distinctions are made on the basis of tasks which nurses are allowed or expected to undertake. But nursing is more than a list of tasks and other differentiations are pertinent, including knowledge base and how nurses think and reason.

Thus, attention was given in this study to cognition and the kinds of thinking that student nurses appeared to be doing as they addressed the nursing needs of two hypothetical but typical patients. Most of the thinking patterns observed were typical of what people do when involved in professional work, but nurse-thinking emerged as, not only particular to nursing, but a learned and essential way of reasoning in determining appropriate nursing care.
It is the area where knowledge base, nursing theory, practical application of that theory, and the lived experience of being human come together. In this complex integrative thinking process a professional brings together the sources of knowledge available, selecting what is relevant and eliminating what is not, considering what can be applied directly in a particular context and what must be modified. Novices must do this very deliberately and consciously (and sometimes ineptly), but with experience it becomes more automatic (Schon, 1983). While no literature was found that addresses nurse-thinking specifically, work has been done on the thinking of professionals at work (Roberts, 1991 on science teacher thinking; Schon, 1983 on how expert professionals make decisions). Schon’s work was on the thinking done by professionals who were both well-experienced and recognized by colleagues as experts, with a view to learning how novices can be helped to become expert. This study with novice nurses had a different focus and purpose, but one of the unanticipated outcomes was the importance of this kind of thinking in nursing.

This concept turned out to be key to understanding what knowledge the three types of nurse bring to bear in their practice. This study showed that RNs were more likely to use a higher quality and quantity of nurse-thinking for the case scenario of the elderly man with multiple health problems, and reasonable quality and quantity for the scenario of the young man with schizophrenia. RPNs were more likely to use higher quality and quantity of nurse-thinking for the case scenario of a young man with schizophrenia, and lower quality and quantity for the scenario of the ailing elderly man. LPNs used modest amounts and quality of nurse-thinking for both scenarios, though stronger for the elderly man with physical illness than the young man with schizophrenia. These differences begin to shed some light on exactly what is meant by the differences in breadth and depth of knowledge that the three types of nurse use in practice.

Critical thinking, though not identical to nurse-thinking, overlaps with it, and is very likely a component of it.

Nurse-thinking appears to be relevant in at least the following ways: (1) in understanding the necessary knowledge base for all nurses and for particular types of nurse, and for clarifying why a knowledge base is not just a list of topics studied or skills learned; (2) in considering the implications of the quality of nurse-thinking on the quality of patient care; (3) in considering how to foster high quality nurse-thinking in nursing education; (4) for employment and administration interests; and (5) for further research on how it works and can best be fostered.

Education alone is not sufficient to generate high quality nurse-thinking, but it may well be a key factor. Relevant are such significant matters as: the depth and detail in which a topic is studied, whether topics are taught as silos or as malls, whether students experience theory and practice as segregated or seamless, and the extent to which students are pushed to think and problem-solve.

One factor known to influence student learning and success is the quality of teaching. Instructors who wish to foster nurse-thinking will need to find out which teaching approaches support that goal, probably those that are student centred, and hold students responsible for their own learning.

When asked about teaching, instructors often indicated that they had to learn by trial and error how to teach. Having been hired for their expertise and experience in nursing, they were often new to classroom teaching. A typical pattern was that interviewees recounted
teaching approaches they had tried and been dissatisfied with, and then went on to describe what they had gradually figured out about how to engage students in learning. Most instructors interviewed gave evidence of having thought carefully about their teaching and how they could best help their students learn well, and of being willing to work at modifying their teaching methods and trying out new teaching strategies. Some programs have invested in innovative approaches, for example, taking the time and effort to prepare full case-based programs or setting up simulation practice labs. Instructors care about teaching well, even if some are uncertain how to do that. Mentoring and other support to assist instructors in teaching well is certainly to be encouraged. This can be done in modest or more extensive ways, including individual observations of teaching followed by debriefings, demonstration lessons, sessions on teaching strategies, and having a designated teaching mentor.

Access to nursing education is particularly an issue in northern Alberta. It is possible to earn an LPN credential without leaving the north, but starting into an RN program means moving away. There are population clusters, such as Aboriginal communities or conservative religious groups, in the north which will permit or encourage their young people to earn credentials that allow them to provide services the community needs, such as nursing, if this can be done from home. At the present time, the LPN program is available by distance education, educating some health care workers who are likely to remain living in their home communities and become respected there, making a certain level of health care available right in the community where previously it did not exist.

Quite a number of LPN students indicated that one of their career goals is to work for a time as an LPN and then earn an RN. Within the present educational system, there is a very real need for a bridge that allows one type of nurse to qualify as another type without having to start over. An accepted path for earning a nursing degree by building on knowledge and skills already held would be helpful. (Presently in Alberta only Athabasca University offers such a route.)

If a standard route for laddering up were to be put in place, two of the first questions to arise would be: To what degree is a knowledge base held in common amongst all nurses? and How similar is the depth and detail in which common topics (e.g., anatomy and physiology) have been studied in a first nursing program? These matters need careful attention, but do not appear insurmountable as documents could be aligned so that systematic comparisons could be made.

Given that it is already clear that there is a considerable overlap in the knowledge bases of the three types of nurse (along with additional knowledge particular to each type) and that the boundaries of these overlapping bases are very fuzzy, and given that a number of LPN students and a few RPN students in this study spoke about intending to earn another nursing credential, laddering up through building upon already acquired knowledge and skills, seems both desirable and possible.

A number of instructor participants in the study wanted to go much further and suggested that a better approach to nursing education would be to have all nurses begin in a common program, and then part way through the program have divergence. “What would be very feasible and very economical would be to start all nurses in the same program, and at a certain point (sometime around second year perhaps), have them choose general nursing or an area of specialization and finish their training accordingly.” Or: “I prefer the Australian system which has one nursing college in which every nurse is registered, and in clinical
settings each nurse is responsible to the same person. Nurses can train initially to two
different levels, equivalent to LPN and RN, and RNs can go on to specialize in different
areas.” While a program from another country cannot simply be imported to the Canadian
context, it may well be that some ideas could be taken up.

Turning to workplace settings, what applications might this study have? One of the goals was
to see what assistance could be given to administrators on which type(s) of nurse might best
be deployed in particular settings.

Given comments made within the study it would appear that novice nurses at least should be
reminded that each individual nurse (whether an LPN, RN or RPN) is responsible for her/his
own practice. LPNs do not work under the direction of RNs, but are personally accountable
for their practice. The interviews indicated some lack of clarity about this. One implication is
that an RN cannot lose the license to practice because of what another nurse did or
neglected to do, a concern which was expressed by some participants. Another implication is
that in some situations, such as continuing care settings, LPNs may be in leadership roles.

The credential a nurse holds is important, but so is the individual nurse and a particular
individual’s knowledge and experience. It can be intimidating for a relatively new RN with
limited experience to be in charge and be working with LPNs with 20 years experience. This
is not problematic, provided individuals are willing to assist, and learn from, each other. The
point is rather that individual knowledge and experience matters, so it is not as simple as
specifying credentials.

Results of the data analysis argue that, for new graduates, RPNs are well positioned for
mental health work and to some extent beyond that; LPNs are best suited to dealing with
stable patients; RNs are prepared to deal with the full range of patient conditions, including
critical and rapidly changing patients and case management. This point, frequently made by
instructors, was evident in the scenario data which showed that LPNs proposed appropriate
actions on basic care but were hesitant or unable to do so with more complex situations,
and that RPNs gave appropriate responses to mental illness but were less effective with a
medical surgical situation.

Of course, a complication is that patients can quickly change from stable to critical, and
hopefully do change from critical to stable. If a unit regularly handles more of one kind than
another, this can be taken into account in deployment of nurses. A large clinical facility is
likely to have a wide range of staff employed, so that assistance may be given by one type of
nurse to another when hard pressed by changing patient situations. Smaller facilities with
mostly stable patients might have LPNs in supervisory roles with RNs on retainers to consult
when needed. Again, the individual nurse and the extent of her/his experience and expertise
can also be taken into account when making appointments to leading or supervisory
positions.

There was relatively broad agreement amongst LPN and RN participants that LPNs can do
skill-based tasks as well as RNs; their technique is equally good. (Some say that at
graduation it is better since as students they may get more practice.) The dispute arises over
whether LPNs can therefore give very adequate care or whether RN presence is needed
because RNs are better able to analyze causes of conditions and to make more
sophisticated observations about cause and effect. (It is worth noting that this argument, if
carried one logical step further, could say that nursing knowledge is insufficient and a
physician is needed at all times.) As judged from the comments offered by students, there is risk that this tension is being inculcated into the next generation of nurses.

LPNs are certified to do that which is included in their scope of practice, and competence must be assumed (unless an individual has demonstrated incompetence). An analogy may be helpful: in present situations, nurses must decide when to call a physician, and while this is clearly a judgment call, for the most part it seems to work. In the same way, if LPNs are responsible for basic care, they can determine when to consult an RN or another health care professional. The student work on the scenarios showed LPNs to be very aware of their own limits in practice and very attuned to consulting someone with more expertise, sometimes doing so before it was necessary.

In the current health care context, it seems expedient, even necessary, that each nurse work to full scope of practice. The instructors interviewed were very clear that their programs seek to educate student nurses to be able to do all the work that they are licensed to do; the usual pattern is that the program of study is planned to accomplish that goal.

For those interviewed the tensions appear to be based in two issues. For RPN interviewees, both students and instructors, the concern was over which clinical settings they are, or are not, permitted to work in. For LPNs the concern was that in some settings local policy does not allow them to do tasks they are prepared and licensed to do. RNs did not really express this kind of concern, but were more diverse in their views in this regard, with some seeing changing roles as a concern and others seeing them as a welcome opportunity.

The three factors of stability, nursing experience, and system support are each, separately and interactively, vital in staffing decisions. For anyone responsible for deploying nurses, these three areas and their interaction seem absolutely critical. First, the nursing qualifications or expertise required depend upon the context (e.g., how stable or critical the patients tend to be, how complex their conditions, what specializations are involved); one size does not fit all. A second factor is the quantity, but especially the quality, of the nursing experience an individual nurse has had. Clearly education is an important part of a nurse’s background, along with the range of experience and the learning that has come through those experiences; nurses are not interchangeable. In considering deployment, however, it is not only the experience of an individual which counts, but if there is a nursing team, the range and depth of experience across the team as a whole. A third factor is what supports exist in the system within which nurses are working. An individual with limited experience might safely be given more responsibility in a situation in which help is at hand if needed than in a setting where resources (human and otherwise) are more limited. These three critical factors—stability, experience, and system support—and all the ways they can interact need close attention.

With regard to research, two aspects are considered: first reflection on this particular study, then implications for further research.

The scenarios developed for this study appear to have been effective in meeting the research goals. The assigned task of preparing a plan of care was specific enough that students had a focus to work toward and open enough that it did not pre-determine how they should go about the task. It has been well established that people learn when the task they are assigned is not so easy that it has been already well learned, and not so difficult that it is impossible to complete, but rather in between those two in the ‘zone of proximal development’ (Vygotsky, 1986). In that zone, learning can occur if the teacher scaffolds the
task for the student and if the student is willing to think hard. In the task assigned to the student nurses in this study, they all could do something sensible with it (it was not too hard), and while some did it well, no one completely mastered it in all respects (not too easy), evidence that it was in the zone of proximal development for them. Thus, the task was at an appropriate level of difficulty for student nurses and was useful in exploring their nursing knowledge.

In qualitative research it is important to triangulate the data as fully as possible. That was done in this work through checking for congruence among instructor interview data, student interview data, student knowledge demonstrated in the scenario discussions, and to a more limited extent program descriptions. Circumstances precluded being able to access two desirable sources of relevant information, certification examinations and observation of student nurses at work in real or simulated clinical settings. While this limitation deprived the study of desired richness, the data and the triangulation were extensive enough to accomplish the research goals. Adding further sources may also be seen as a further research opportunity.

The scenarios were a good source of insight into the research goals; they, or variations of them, could be used in further research on related topics. Further work could be done on a systematic examination of what content is taught in different types of nursing programs; also on how teaching methods affect nurse-thinking and other kinds of thinking nurses do. The meta-model was developed iteratively through this work, starting with existing work on congruence models, and moving toward rules for making comparisons. The meta-model is ready to be tested and applied in further studies of overlapping professional areas.

A superordinate goal of this project was the development of a methodology or model that would permit conducting a comparative analysis of professional knowledge bases at a better than superficial level. The results of the process followed lend support to this approach as a viable one. The data sources identified all yielded useful information at various levels. Congruence as an organizing principle helped conceptualize the notions of convergence and divergence among the knowledge bases. The notion of granularity facilitated selecting appropriate levels of detail at which to analyze the data available. In concert the elements of the model permitted fine-tuning of researcher focus to increase attention to the knowledge bases as instantiated by the student nurses. The classification scheme which emerged from the data proved useful in understanding the data and pointing to useful interpretations, one of which was the concept of nurse-thinking.

In this study, all three types of nurse engaged to some extent in nurse-thinking, although to varying degrees and depth. It appears that there is a strong relationship among three factors: the foundational knowledge of the nurse, the complexity of the task and the extent of the nurse-thinking. The better the grasp of the knowledge base, the greater the amount of nurse-thinking; the more complex the task, the greater the nurse-thinking—provided the knowledge held was sufficient; the less knowledge, the more limited the nurse-thinking. It emerges in the face of complexity if the relevant foundational knowledge is present and well established, and disappears if the level of complexity is overwhelming. The ability to deal with complex situations seemed to depend considerably on the ability to engage in nurse-thinking. It seems likely that there is a relationship to studying nursing and how nursing is taught, with some indication that nurse-thinking is more likely to occur if the academic program encourages problem-solving and students taking responsibility for their own learning. Amount of time spent studying nursing may also be a factor, although by itself it seems unlikely to be productive, as the way in which that studying is done will be influential.
Not known from this work, but worth further investigation regarding nurse-thinking are: whether or how more nursing experience affects it; the likelihood of it increasing with environmental factors that encourage such thought patterns and conversely being dampened by those which do not; and the effects if any of ongoing professional development.

Further research, in addition to seeking to understand more fully the phenomenon of nurse-thinking, might also explore possible links between such research and the research on nursing expertise, for example Benner's research (1984), an extension of Dreyfus & Dreyfus's stage theory of the development of expertise progressing from novice through several stages to expert.

Conceivably readers of this report may draw implications in addition to, or other than, those that have been discussed in this section. Those addressed have ranged across documentation, professional relations, education, administration, and research, and appeared to be the most salient as the data were analyzed.
AFTERWORD

The Knowledge and Education Project was initiated to probe the knowledge bases of three types of nurse (LPN, RN, RPN) in Alberta with a view to understanding more fully how they relate to one another. Interest was less in comparison of what nurses are expected to have learned and more in what they actually learned, particularly how knowledge was held, accessed, and instantiated by the time of graduation. A qualitative methodology was developed which permitted gathering data on formal knowledge (academic curricula), expected knowledge (scopes of practice), and instantiated knowledge (working with case scenarios). The document analysis and casework were augmented by interviews with both nursing educators and student nurses.

The project was particularly interested in the knowledge of novice nurses and therefore was restricted to student nurses within sight of graduation. The scenarios used were particularly helpful in exploring not only the knowledge held, but how the student nurses used it in preparing a plan of care for hypothetical patients, including the accuracy, depth, appropriateness and completeness of their proposed care, and also the kind of thinking they appeared to do to understand the nursing issues and reason their way to what actions ought to be taken. It was also possible to extrapolate from the methodology employed to develop a meta-model that might guide the planning for other studies looking at the relationships among knowledge held by the membership of related professions.

Details of what can be learned from the study are located in this report throughout the discussion of the data, and in the logical implications of evidence considered in the discussion of the knowledge breadth or limitations held by participating student nurses.

The knowledge base of RN students at point of graduation would indeed appear to be larger than that of LPNs and RPNs. The RN knowledge base would appear to subsume the LPN knowledge base. There were, however, noticeable differences in how the common knowledge between LPNs and RNs was instantiated. LPN student nurses tended to approach the case scenarios they were given in a linear, systematic fashion; RNs in a more holistic, case-management approach. While the knowledge demonstrated by the RPNs in part overlapped both LPNs and RNs, a significant part of the RPN knowledge base appeared to lie outside those of the other two types of nurse. This was not unexpected given that RPNs almost by definition have a heavy concentration on mental health.

The concept of “nurse-thinking” evolved during the analysis as a useful label for a set of cognitive activities employed by nurses in the course of making professional decisions, and this proved a useful marker in differentiating the knowledge bases of the types of nurse.

From the outset the researchers tried to be alert to the prospect that factors other than the formal curriculum might influence the knowledge bases of novice practitioners. In the case of the present study these appeared generally as contextual factors which influenced how the novices thought about their profession and how they applied their knowledge, also how they thought about the types of nurse other than their own. Because contextual factors filter knowledge as it is developed and applied, those that were deemed of particular significance were reported here.

Beyond delineating commonalities and differences among the knowledge bases of the three types of nurse which formed the focus of this study, the study has developed a way of
examining the kinds of thinking which nurses appear to do when considering the care of particular patients. More broadly the study has also demonstrated an approach to examining cognitive activities as a dimension of professional knowledge. It has done so through a research model that is transferable to other combinations of professionals. To this end it also developed a tentative meta-model that can provide guidance in developing the methodology to make those comparisons.
REFERENCES


## APPENDIX A

Membership of KEP Steering Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Representing</th>
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<tbody>
<tr>
<td>Mary-Anne Robinson, Chair</td>
<td>College and Association of Registered Nurses of Alberta</td>
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<td>Lynn Redfern</td>
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<td>Gloria Bauer</td>
<td>College of Licensed Practical Nurses of Alberta</td>
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<td>Linda Stanger</td>
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<td>Jeanne Besner</td>
<td>Research Representative</td>
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<tr>
<td>Sandra MacDonald-Rencz</td>
<td>Office of Nursing Policy, Health Canada*</td>
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<td>Brenda Canitz</td>
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<td>Marielle Demers</td>
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<td>Noreen Linton</td>
<td>Clinical and Nurse Practice Leaders Network</td>
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<td>Barbara Lowe</td>
<td>College of Registered Psychiatric Nurses of Alberta</td>
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<td>Sandra McLean</td>
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<td>Elizabeth Taylor</td>
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<td>Roberta Parker</td>
<td>Alberta Health and Wellness*</td>
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<td>David Allen</td>
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<td>Anita Paras</td>
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<td>Donna Romyn</td>
<td>Alberta Nursing Education Administrators</td>
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<tr>
<td>Roberta Stasyk</td>
<td>Alberta College of Pharmacists</td>
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* Indicates only one of the names listed served on the committee at one time.
APPENDIX B

Ethics Approval Form

Protocol Number: 0702

Name of Principal Investigator: Mary-Anne Robinson Executive Director, College and Association of Registered Nurses of Alberta (Carna) representing the Knowledge and Education Project (KEP) Steering Committee

Study Title: Assessing the breadth and depth of knowledge and education of Registered Nurses, Licensed Practical Nurses and Registered Psychiatric Nurses in Alberta

The Community Research Ethics Board of Alberta has reviewed the protocol involved in this project. The protocol is found to be ethical within the limitations of research involving human subjects.

Responsibility for monitoring the implementation of the research and its adherence to this protocol is primarily that of the institution or facility the research is affiliated with. Concerns arising from this monitoring must be reported to CREBA.

Date of CREBA review meeting: March 16, 2007

Approval granted as of: May 2, 2007

Documents reviewed and approved:
- Request for Review Application form received March 5, 2007 (dated March 2, 2007) including KEP Steering Committee List and KEP project structure and accountability
- Forms: KEP Information Sheet Faculty Members and Program Administrators, KEP Faculty/Administrator Individual consent form, KEP Information for Students, KEP Student Individual Consent Form
- KEP budget
- Curriculum Vitas
- KEP Letter with attachments received April 25, 2007 (dated April 23, 2007) in response to CREBA's request for clarifications. Attachments: Letter of Introduction, Confidentiality Agreement, Project Communiquè, and a letter from each of nine deans or chairs endorsing implementation of KEP at their respective nursing education sites.

Conditions for approval:
- Appropriate consent is being obtained during the consent to participate process.
- All proposed interview scenarios are submitted to CREBA for review once they are developed and prior to using them with the various student nursing groups.

Signed,

[Signature]

Dr. Mæve O’Beirne
Chair, Community Research Ethics Board of Alberta

This approval is valid for one year
APPENDIX C

Semi-Structured Interview Questions

Students:

1. Now that you are near the end of your program, what are you most enthusiastic about in starting to practice as a nurse?

2. As you think about beginning to practice, which areas of knowledge are you most confident about? Which areas of knowledge do you consider you need to learn more about?

3. What clinical areas are you most confident about working in? In which clinical areas do you need more practice?

4. Are you familiar with the scope of practice for your profession? What does it mean to you now? How do you expect it to be significant in your professional practice?

5. Mini-case
   a) Suppose you were assigned to care for a 7-yr-old brought into the hospital with minor head injuries after surviving a plane crash in which her grandfather died. Even before you read the clinical data and lab reports, how would you start to think about caring for this child?
   b) When the child’s parents arrive at the hospital, how would you approach them? What communication strategies would you use?

6. Suppose you are assigned a patient with congestive heart failure. On first contact with the patient, what would be your three priority assessments? Why did you choose each of them?

7. When you are working as a member of a multi-disciplinary team, what do you need to do in order to help the team function most effectively? How can you best work with other nurses?

8. During your clinical experiences, have you worked at all with [RNs, LPNs, RPNs]? What differences have you noticed in how you go about nursing and how they do? What similarities did you observe?

9. What further learning opportunities, if any, are you intending to take up in the next 3 years? [If the response is not specific, ask: How will you go about doing that?]

10. Is there anything else you’d like to add?
Faculty:

1. Let’s start with your approach to teaching nursing. What do you enjoy or value most about being a nursing educator?

2. What instructional methodology(ies) do you use in your teaching?
   Why have you chosen those?
   What links, if any, do you see between the way you teach and how your students practice?

3. What is the key emphasis or focus in your program? (This is not asking about a nursing specialization such as pediatrics or cardiology, but rather about the key value or philosophical stance you seek to convey to your students.)

4. Do you teach professionalism? If so, how do you do that?

5. What resources did you use to develop your curriculum?
   [What informed your curriculum development?]
   [Did you consult external regulatory bodies?]

6. Do you teach to the Competency Profile or Entry-to-Practice Competencies specified by your professional body? [If interviewee says no, ask why that is. If yes, ask how that is done.]

7. How do you assess your students during their studies to ensure they are meeting the competencies?

8. Are you familiar with the Competency Profile or Entry-to-Practice Competencies for [the other two groups of nurses]? What do you see as the 3-4 most crucial differences between theirs and yours?

9. A 2003 paper issued by the three nursing colleges states that all nurses study from the same body of nursing knowledge, but “the foundational knowledge base of RNs, RPNs and LPNs is different as a result of differences in basic nursing education.” What do you consider to be the foundational knowledge base of [your type of nurse]? How do you consider that the three knowledge bases differ?

10. Of the three types of nurse, what can each contribute in a clinical setting?
    [What do you think is valuable about working with (other types of) nurses in a clinical setting? What is problematic about it?]
    (Note: If answer is given from an instructor’s perspective, ask also for answer from the clinical nurse perspective.)

11. Do you specifically prepare your students to work as part of an inter-professional team? If so, how?

12. Is there anything else you’d like to add?