Generously funded by the Nursing Secretariat, Ontario Ministry of Health and Long-Term Care
Project Steering Team:

Co-Principle Investigators:
Frances Flint
Director of Nursing Practice
Sunnybrook Health Sciences Centre

Susan VanDeVelde-Coke
Executive Vice-President, Programs
Sunnybrook Health Sciences Centre

Co-Investigators:
Kim Alvarado
Chief of Nursing Practice
Hamilton Health Sciences

Margaret Blastorah
Director, Nursing Knowledge, Research & Innovation
Sunnybrook Health Sciences Centre

Faith Boutcher
Director, Professional Practice, Research & Education
North York General Hospital

Kathy Chesnick
Professional Practice Leader, Nursing
Kingston General Hospital

Farah Khan Choudhry
Project Coordinator
Sunnybrook Health Sciences Centre

Lenora Duhn
Director, Nursing Research
Kingston General Hospital

Nancy Fletcher
Director of Professional Practice
The Scarborough Hospital

Kaiyan Fu
Director, Nursing Innovation & Change Management
St. Michael’s Hospital

Petrina McGrath
Director of Nursing
University Health Network

Mohini Pershad
Professional Practice Leader, Nursing
North York General Hospital
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Abstract

Purpose: This report describes the development, feasibility, utility and psychometric testing of the Patient Care Needs Assessment (PCNA) instrument and the Unit Environmental Profile (UEP). These tools, and the associated processes for utilization, are intended to facilitate decision-making related to nursing skill mix.

Methods: A descriptive exploratory design using a combination of quantitative and qualitative approaches, and a convenience sample of 36 medical/surgical units across seven acute care hospitals was used. Reviews of patient care needs were conducted on each participating unit on two separate occasions, using a consensus-based approach. Information about unit characteristics was collected by survey following the patient reviews on each unit. Debriefing meetings were held with unit leaders to review patient and unit data and explore ways in which these data could be used to support nursing staff mix decision-making. Focus groups with review participants were conducted following the reviews were completed to assess participants’ responses and perceptions of the review process.

Findings: The research supports the validity and reliability of the Patient Care Needs Assessment tool and the consensus based process for conducting patient care reviews. The analysis of the data evaluating the Unit Environmental Profile tool provided limited evidence of the tool’s face validity and feasibility although it did indicate that the respondents were reasonably satisfied that the UEP tool was capturing some of the elements of interest to determine environmental complexity.

Conclusions: Results support the utility of the Patient Care Needs Assessment tool and the review process informing RN/RPN staff mix decision-making. The findings suggest a need for further refinement and testing of the Unit Environmental Profile Tool to determine relevant data points that should be included in staff mix decision making. Future research is required to evaluate the quality of decisions resulting from the application of the toolkit, to assess and compare findings from the application of the toolkit with current workload measurement tools to illuminate the processes through which nursing leaders can best translate the information generated through the tools into staff mix decisions.
Contents

1 Introduction ............................................................................................................................................. 1

2 Background/Context ................................................................................................................................ 1

2.1 Overall Pilot Testing Evaluation Objectives: ...................................................................................... 2

2.2 Evaluation Questions: ......................................................................................................................... 2

3 Methodology ........................................................................................................................................... 3

3.1 Research Design: .................................................................................................................................. 3

3.2 Setting and Sample: ............................................................................................................................... 3

3.3 Development of Tools and Process: ..................................................................................................... 3

3.3.1 Development of the Patient Care Needs Assessment Tool: ............................................................. 3

3.3.2 Development of the Unit Environment Profile Tool: ...................................................................... 6

3.4 Pilot Testing: ......................................................................................................................................... 6

3.4.1 Development of the Review Process: ............................................................................................... 6

3.4.2 Evaluation Tools and Other Instruments: ....................................................................................... 7

4 Ethical Considerations and Safeguards .................................................................................................. 8

5 Procedures .............................................................................................................................................. 9

5.1 Unit Reviews: ...................................................................................................................................... 9

5.1.1 Advance Preparation ......................................................................................................................... 9

5.1.2 Day of the Review ............................................................................................................................ 9

5.1.3 Application of the Patient Requirements for Nursing Care Tool: ............................................... 11

5.2 Administration of the Unit Environment Profile: ................................................................................. 11

5.3 De-briefing Meetings with Patient Care Unit Nursing Leaders: ....................................................... 11

5.4 Focus Groups for Review Team: ......................................................................................................... 11

5.5 Full-Day Review Meeting: .................................................................................................................. 12

5.6 Data Analyses: ..................................................................................................................................... 12
6 Results ...........................................................................................................................................12
  6.1 Results Related to the Patient Care Needs Assessment Tool: .............................................12
    6.1.1 Descriptive Results of Patient Care Needs Assessment Reviews: ..............................12
    6.1.2 Validation of the Patient Care Needs Assessment Tool: ...........................................18
  6.2 Results of the UEP Tool Testing: .........................................................................................21
    6.2.1 Feasibility Testing: .........................................................................................................21
    6.2.2 Face Validity Analysis: ................................................................................................23
  6.3 Results Related to Unit Review Process: .............................................................................26
    6.3.1 Descriptive Results Related to the Reviews: .................................................................26
    6.3.2 Results from the Focus Groups: ....................................................................................27
    6.3.3 Results from the Questionnaire for Nursing Unit Leaders: ........................................29
  6.4 Results Related to Staff-Mix Decision Making Process: ....................................................29
    6.4.1 Results from the Focus Groups: ....................................................................................29
    6.4.2 Results from the Questionnaire for Unit Nursing Leaders: ........................................30
7 Discussion of Results ................................................................................................................31
  7.1 Patient Care Needs Assessment Tool: ................................................................................31
    7.1.1 Utility of the Yes/No Questions: ....................................................................................31
    7.1.2 Dimension Scales: .........................................................................................................32
    7.1.3 Reliability of the PCNA Tool: .......................................................................................33
    7.1.4 Convergent Validity: ....................................................................................................33
  7.2 Unit Environment Profile: ....................................................................................................34
  7.3 Review Process: ...................................................................................................................35
  7.4 Staff Mix Decision Making Process: ...................................................................................37
8 Implications for Practice and Research ..................................................................................38
  8.1 Implications for Practice: ....................................................................................................38
1 Introduction

Nurse staffing is critical to patient safety, health and well being, as nurses deliver more individual health care than any other healthcare provider (CHSRF, 2006). Appropriate staffing is not dependent merely upon the number of nurses providing care on a clinical ward, but involves having nurses with the right skills, experience, education, working within the right type of staffing model and the right mix of other healthcare providers (CHSRF, 2006).

In 2007, the Ontario Ministry of Health and Long-Term Care identified the need for long range health human resource (HHR) planning. In response, the Nursing Secretariat funded 17 Demonstration Projects. The “RN/RPN Utilization Tool-Kit Project” was one of the projects selected for funding. The partnership of hospitals for this project included the lead, Sunnybrook Health Sciences Centre (SHSC), and University Health Network, St. Michael’s Hospital, Hamilton Health Sciences, North York General Hospital, Scarborough General Hospital and Kingston General Hospital. The mix of academic and community hospitals in southern Ontario offered a broad scope for the project focusing on medical-surgical units.

A detailed budget was submitted to the Ministry of Health and Long-Term Care Ontario, Nursing Secretariat and approved in full as submitted for $304,580.

The overall project goal was to develop a toolkit to inform decision-making regarding appropriate nursing staff mix in acute care medical/surgical units to influence positive patient outcomes across community and academic health science centers.

2 Background/Context

There is a growing body of research linking staffing mix and outcomes (College of Nurses of Ontario [CNO], 2005). Nursing skill mix has been shown to impact both patient and nurse outcomes (Aiken et al., 1999; Blegan, Goode et al., 1998; Eastabrooks et al., 2005; Lichtig et al., 1999; McGillis Hall, Doran, & Pink, 2004; McGillis Hall, 2003; McGillis Hall et al., 2003 Needleman et al., 2001; Sochalski et al., 1997). This research highlights the need for decision-makers to consider the appropriate utilization of RNs and RPNs in formulating decisions related to nurse staffing.

An effective and formalized staffing plan requires an understanding of the complexity involved in patient care and in matching human resources appropriately (skill, number of staff, education, and experience). Effective decisions that match the nursing category with client needs should be made with deliberation and focus on three factors of equal importance – the client, the nurse, and the environment. The College of Nurses of Ontario (CNO) (2005) developed a three-factor framework to guide the Utilization of Registered Nurses (RN) and Registered Practical Nurses (RPN). This framework proposes that the more complex the client situation, and the more dynamic the environment, the greater the need for an RN to provide the full range of care, assess changes, re-establish priorities and determine the need for additional resources (CNO, 2005).

Yet, while some progress has been made in developing frameworks to assist in decision-making related to nurse staffing, evidence suggests that application of these frameworks remains a challenge for decision-makers (McGillis Hall et al., 2006). And so, despite the increasing body of knowledge and evidence linking staffing and patient outcomes and safety, there remains a gap in available evidence-
based tools and literature to guide decision-making processes that can assist leaders in making staffing decisions that best meet the patient care needs.

Therefore, recognizing that there are common questions and challenges in regard to Health Human Resource (HHR) planning, the above-noted 7 acute care hospitals in southern Ontario came together to undertake the current study and to continue on the journey to refine and test tools and decision review process. Using the theoretical underpinnings from the College of Nurses of Ontario’s Three Factor Framework to guide the utilization of RNs and RPNs (2005), this Ministry of Health and Long-Term Care – Nursing Secretariat-funded project involved the development an RN/RPN Utilization Tool-Kit. To achieve the end-product of a tool-kit, the project set out to systematically determine the validity and reliability of a Patient Care Needs Assessment tool; determine the validity of a Unit Environmental Profile tool; and to describe a review process. The tool-kit was intended to support nursing staff-mix decision-making in both small and large healthcare organizations across Ontario.

2.1 Overall Pilot Testing Evaluation Objectives:

The objectives of the project were:

1. To assess the reliability, validity and feasibility of the Patient Care Needs Assessment (PCNA) tool (see Appendix A).
2. To assess the validity and feasibility of the Unit Environment Profile (UEP) tool (see Appendix B).
3. To describe the process through which nurses use these tools in formulating nursing staff-mix decisions.
4. To identify critical success factors and lessons learned regarding application of the PCNA tool, the UEP tool, and a review process that is designed to inform nurse staffing-mix decision-making.

2.2 Evaluation Questions:

The project aimed at answering the following questions:

1. Is the PCNA tool a valid, reliable, and feasible instrument for determining the complexity, predictability, and risk potential for negative outcomes related to care, in adult medical/surgical inpatients?
2. Is the UEP a valid and feasible tool to use for determining the complexity, stability and resource availability of a clinical unit?
3. a) What are the characteristics of a review process that includes the use of the PCNA and the UEP tools?
   b) What are the characteristics of a decision-making process that utilizes findings from the review?
4. What lessons were learned from the demonstrated use of the PCNA tool, and the UEP tool when undertaking a review process to determine nurse staffing-mix decisions?
3 Methodology

3.1 Research Design:
A descriptive, exploratory design using a convenience sample from seven healthcare organizations was used. Both quantitative and qualitative descriptions were employed. Reviews of patient care needs were conducted on each participating unit on two separate occasions, using a consensus-based approach. Information about unit characteristics was collected by survey following the patient reviews on each unit. Debriefing meetings were held with unit leaders to review patient and unit data and explore ways in which the data could be used to support nursing staff mix decision-making. Focus groups with review participants were conducted following the reviews to assess participants' responses and perceptions of the review process.

3.2 Setting and Sample:
The study was conducted across 36 medical/surgical adult inpatient units from five academic teaching hospitals and two community hospitals in southern Ontario. All patients admitted to the study units on the review day were reviewed. Unit reviews were conducted by teams comprised of the unit manager, advanced practice nurse or clinical educator, the team leader/charge nurse, and the staff nurse assigned to the patient. A consensus-based approach was used for decision-making. Unit data were obtained from the manager using a standardized template. Data related to perceptions of the tools and process was obtained from those who participated in the reviews.

Senior nursing administrative support and commitment from each of the 7 sites to participate in this demonstration project was garnered prior to submission to the Ministry of Health and Long-Term Care's grant competition.

3.3 Development of Tools and Process:

3.3.1 Development of the Patient Care Needs Assessment Tool:
This section details the development of the PCNA instrument. The PCNA was designed to measure hospitalized medical and surgical patient care requirements. It was first developed by SHSC in 2001 based on the existing College of Nurses of Ontario's framework for utilization of Registered Nurses and Registered Practical Nurses. The original Sunnybrook tool was used to conduct reviews of patients on a number of units to guide decision-making related to staff mix for acute care medical surgical units and repeated in 2005 at the Holland Orthopaedic and Arthritic Centre to evaluate the needs of patients having elective surgery for hip and knee replacement. In 2007, University Health Network (UHN) adapted the tool based on feedback from staff and further review of the literature. Reviews were then conducted on four General Medicine units utilizing the tool. Also in 2007, Kingston General Hospital (KGH) conducted a similar process, making minor changes to the instrument and using it in a review of their inpatient medical/surgical units.

3.3.1.1 Patient Care Needs Assessment Content Validity:
The goal of phase 1 of the current project, conducted in the spring of 2008, was to generate items and construct an instrument that exhibited content validity and could be subjected to additional psychometric testing. Content validity is indicated if the items in the instrument sample the complete range of the attribute under study (Trochim, 2001). The blueprint for the instrument consisted of four main constructs derived from the CNO Three Factor Framework: stability, complexity, predictability,
and risk for negative outcomes. Version PCNA 1 was an adapted version of the tool developed by SHSC. It included 12 items, all closed ended statements.

The questionnaire was subjected to review and critique by a panel of 10 nursing practice experts from the partner hospitals along with the project coordinator. Based on the feedback, the content and wording of the PCNA 1 were revised. Items were added including vital sign parameters based on the Critical Care Secretariat guidelines (Critical Care Secretariat, Ontario Ministry of Health and Long-Term Care [MOHLTC], 2007), and a time period of 48 hours in which an unexpected health event or crisis would be identified. It was felt that these additional parameters would increase clarity and reliability of the instrument. PCNA 1 item # 1 and # 2 were expanded to identify if the patient’s vital signs and level of consciousness was within the expected range for that patient. PCNA 1 item # 3 was modified to explore “acute confusion/agitation” rather than “delirium”. Examples of conditions requiring increased assessment and monitoring, emergent situations, and unexpected health events were added. Item # 12 exploring patient stability was reworded to focus on the construct of stability. Three items were added to measure complexity, predictability and risk. Each of these items was placed on a 6-point scale. PCNA 3 was created as a result of the panel review. It contained 11 dichotomous items, one dichotomous sub-item, one sub-item with a yes, no or not applicable choice, one sub-item identifying frequency of vital signs (q2h, q4h, q6h, q8h, other), and three items each on a 6-point scale. Definitions of stability, complexity and predictability were developed by the research team for use with the instrument.

According to Lynn (1986), when using ten content experts, the proportion considering that the statement is relevant or readable should be above 0.70. During open discussion and through a consensus-like approach, each item on PCNA 3 was judged both relevant and readable by 7 or more of the panel experts. The Project Steering Committee approved the PCNA 3 for use on the study pilot units.

3.3.1.2 Pilot Testing:
Pilot testing of the PCNA and review process were conducted prior to implementation of the study on two surgical units at SHSC. The external reviewers for the pilot were two directors of nursing and the project coordinator. The purpose of the pilot study was to ensure clarity and ease of use of the instruments, to establish guidelines for the review process, and to identify any other potential issues with the tools or process. A consensus approach was used to determine the response to each item on the tool.

Following each review session, the review team members were invited to complete a questionnaire asking their opinion of the PCNA tool. Ten PCNA Opinion Questionnaires (PCNAOQ) (see Appendix C) were received during the pilot. A number of changes were made to PCNA 3 based on feedback from the pilot.

PCNA 5 question 3b, reflects a change related to determining if the fluctuation in a patient’s level of consciousness is the baseline for that patient. “If no, is this the baseline for this patient” was changed to “if yes, is this the baseline for this patient. Question #12, a dichotomous question, was changed from “Do you feel that this patient is stable?” to “the patient is stable.” Both of these changes were intended to clarify the intent of the question.
The review team expressed concerns that review day #1 and day #2 were not clearly identified. The descriptive section in PCNA 6 reflects the decision to differentiate the review days with a designated check box (i.e. #1 or #2) for each day.

PCNA 6 reflects continued requests for clarity of questions relating to the level of consciousness of the patient. The “last 24 hours” was removed from question 3a. Question 3b, “If yes, is this the baseline for this patient?” was changed to “Is this within the patient’s expected range?” A new question, 3c, was added “frequency of neurological assessment being obtained”. A choice of answers was provided, q2h, q4h, q6h, q8h and other.

Questions 3a and 3b were temporarily removed from PCNA 7 as further consultation with the project steering team ensued. Questions 3a and 3b are captured in PCNA 8 and 3c is reworded from a statement to a question “How often are neurovitals being assessed?” This change was requested to reflect consistency is how the questions were posed.

PCNA 9 reflects further requests for consistency in how the questions were posed. Questions 2a, 2c, 4, 5, 6, 7, and 8 were reworded from statements to questions. It was decided to remove 3c, the question about frequency of neurovitals as this appeared to be capturing workload rather than patient care needs which were captured in 3a and 3b. The example related to blood glucose in question 6 was further clarified to indicate that a patient’s condition required increased assessment and adjustment in the plan of care when blood glucose “is not well controlled”.

Question 9 in PCNA 8 was removed from PCNA 9 as review teams expressed difficulty distinguishing between questions 8 and 9 that asked about unexpected health events and unplanned treatments/interventions. In response to concerns about the narrow focus on educational resources in PCNA 8 question 10, the statement “The patient/family has complex educational needs beyond the routine education provided on this unit” became question 9 in PCNA 9 and was reworded as a question within the broader concept of patient supports, i.e. “Do the patient and/or family have complex support needs?” Question 11 in PCNA 8, “The patient’s/family’s needs require coordination of services to facilitate complex decision-making beyond the routine practices on this unit” was clarified in PCNA 9 and reworded from a statement to a question, “Are the patient and/or family facing complex decisions that require coordination/collaboration with multiple team members?”

The measurement scale in PCNA questions 12 – 14 was changed from a 0 – 5 to a 1 – 6 point scale in response to comments that it is unlikely a hospitalized patient would be assigned a 0 score.

PCNA 10 reflects the removal, and spelling out of, abbreviations that may be misinterpreted including “>“, “<“. For ease of analysis, the “not applicable” answer option was removed from question 3b. Question #11, patient stability, was changed from a dichotomous answer of yes or no, to a 6-point scale. This was seen as consistent with the measurement of the other major constructs.

PCNA 11, question #11, patient stability, was reworded to reflect consistency with the measurement of complexity, predictability and risk for negative outcomes. The wording changed from “Do you feel that this patient is stable?” to “Overall, how stable is this patient?” The project steering committee reviewed each question in PCNA 11 and approved the tool for use in the main study.

The final version of the PCNA evaluated in the current project included 17 questions regarding care requirements. Eleven questions had yes/no responses. For four questions, responses were rated on a 6-point Likert-type scale with anchors “1 = Very stable/less complex/highly predictable/less risk” and 6
“Very unstable/highly complex/less predictable/high risk”. The tool was designed to be used in a group or team setting, using a consensus approach to determine the response to each item. Based on previous experience with this instrument, it was anticipated that it would take approximately 12 minutes per patient to complete.

3.3.2 Development of the Unit Environment Profile Tool:

The Unit Environment Profile (UEP) tool was based on an instrument previously developed at University Health Network in 2007 and also used at Kingston General Hospital (KGH). Revision of the tool for the current study was also guided by the work of Dr. Linda O’Brien-Pallas and colleagues (1997) on nursing unit environmental complexity, the College of Nurses of Ontario (2008) three-factor framework, and other relevant literature.

3.3.2.1 Unit Environmental Profile Tool Content Validity:

Items for the current UEP were initially generated by members of the research team and classified according to three domains: personnel characteristics, unit characteristics, and day of the review. The section on “personnel characteristics” examined items such as: full/part-time/casual staff ratios, experience of staff, and staff turnover. The section on “unit characteristics” included items such as number of beds, type of rooms, length of stay, and any major changes to the unit in the past year. Items relating to description of unit support and items that would potentially impact the “day of review”

A panel of 10 nursing experts from across the participating hospitals reviewed the items generated to describe the clinical environment in an effort to establish content validity, with specific focus on readability and agreement of inclusion of each item to comprehensively determine environmental complexity. A consensus approach was taken to determine the final elements. Final adjustments included removal of the “day of review” section from the actual tool, to be included in a separate document for inclusion in the process during the days when patient reviews occur, as a way to describe the clinical environment at that point in time. Additionally, clarity of intention for certain items was addressed, as well as the framing of questions. The UEP was re-formatted to provide a succinct, relevant and holistic picture of a clinical setting that would describe their ‘typical’ environment.

3.4 Pilot Testing:

In late May and early June 2008, the pilot testing phase of the UEP occurred. The UEP was distributed to three managers across two hospital sites (Hamilton Health Sciences and Sunnybrook), and additionally involved a review by the implementation team at a third site (St. Michael’s Hospital). Pilot participants provided the following questions/comments: wording needs to be clear in terms of full time equivalents (FTEs) versus headcounts and total RN numbers versus total per day; experience on this particular unit or in nursing overall; need to define specialty certificate and does it have to be in current area of practice; planned or unplanned ICU transfers; internal turnover, external turnover or both; admissions or separations; budgeted or average utilized regarding number of beds; and suggest using average instead of previous 3 months statistics for describing sick rate, over time rate and agency use. Based on this feedback, the tool was further refined and a new iteration was formulated for testing in the current study.

3.4.1 Development of the Review Process:

The consensus-based review process for the pilot was developed based on the process previously implemented at SHSC, and subsequent experiences at UHN and KGH. Responses from the pilot PCNA opinion questionnaires and anecdotal feedback to the project leaders were used to develop the
final review process. It was identified that it would be beneficial to have the Team Leader/Charge Nurse who knew about patient/family history/issues participate in the reviews, so this was added to the review process. It was also determined that the unit nursing team could access the patient health record for assistance in determining the appropriate answer for questions.

The review process involved application of the PCNA to each patient on the unit by a unit review team consisting of the patient’s nurse and unit nursing leaders such as the manager, the APN/educator, and the charge nurse/team leader. A nursing leader who was not a member of the unit team facilitated the discussion. The facilitator posed each PCNA question in turn to the unit nursing team, who collaborated to determine the appropriate response to the question.

Guidelines for review facilitators to achieve respectful engagement of all participants in the review process were also created based on feedback from the pilot (see Appendix D). Guidelines emphasized allowing time for discussion, facilitating input from all participants and valuing every person’s contribution. Although questions were posed to the group by the facilitator, seating was arranged to minimize segregation of the staff nurse by having nursing leaders from the unit sit on either side and having the staff nurse sit opposite the facilitator to maximize eye contact. Participants were requested to turn off blackberries and pagers, and side conversations and note writing was discouraged.

### 3.4.2 Evaluation Tools and Other Instruments:

#### 3.4.2.1 Patient Care Needs Assessment Opinion Questionnaire:

The Patient Care Needs Assessment Opinion Questionnaire (PCNAOQ) (see Appendix C) was developed for the current study to assess face validity and feasibility of the PCNA. It is a self-report questionnaire consisting of five questions that capture the respondent’s perceptions of the comprehensiveness and accuracy of the items with respect to the patient’s care needs (face validity), and two questions that elicit the respondent’s perceptions of the clarity and ease of use of the instrument (feasibility). As noted by Streiner and Norman (1995), ‘face validity’ “simply indicates whether, on the face of it, the instrument appears to be assessing the desired qualities” (p. 5). ‘Feasibility’ refers to the ease with which clinicians can apply the measure in the clinical setting. Responses are documented on a 3-point Likert-type scale with anchors 1 = “Not at all” and 3 = “Very much so”, with the exception of one open-ended question regarding any additional comments participants wished to add.

#### 3.4.2.2 Unit Environment Profile Opinion Questionnaire:

The Unit Environmental Profile Opinion Questionnaire (UEPOQ) (see Appendix E) is similar in form to the PCNA Opinion Questionnaire, and was developed for the current study. It includes four questions that address face validity and two questions that address feasibility. It also includes one open-ended question regarding any additional comments participants may wish to add. Response options for this instrument are the same as those for the PCNA Opinion Questionnaire.

#### 3.4.2.3 Questionnaire for Unit Nursing Leaders:

The Questionnaire for Unit Nursing Leaders (QUNL) (see Appendix F) was developed for the current study. It is a self-report questionnaire consisting of five open-ended questions that are intended to elicit managers’ and other nursing leaders’ perceptions and opinions about the review process. Questions address participants’ perceptions of the impact of the review process on their nursing staff...
mix decision-making, the content of their decisions resulting from the review, and the strengths and limitations of the review/decision process.

### 3.4.2.4 Patient Requirements for Nursing Care Tool:

No tested and generally accepted instrument for assessing patient needs for nursing care was located, precluding comparison of the PCNA tool with a “gold standard” for criterion validity. However, another instrument designed to measure patients’ needs for nursing care, the “Patient Requirements for Nursing Care (PRNC)” tool developed by Fulton and Wilden (1998) was located (see Appendix G). Like the PCNA, the PRNC goes beyond a measurement of the volume of nursing work, or amount of time the patient’s care needs generate, to address the nature of those needs, taking into consideration the level of nursing decision-making, number of psychosocial systems involved, monitoring intensity, and number and type of technical procedures required. The authors of the tool described it as an “easy to use, valid and highly reliable instrument for describing and quantifying the nursing care needs of general medical-surgical patients”. Given the similarity of purpose between the PRNC and the PCNA and the lack of a ‘gold standard’ for comparison, the PRNC was a logical choice for validation of the PCNA.

The PRNC is a 15-item questionnaire also developed in Canada that is designed to be completed by the patient’s nurse to quantify the patient’s nursing care needs based on the complexity of care requirements, acuity of illness, and level of dependency (Fulton & Wilden, 1998). The instrument includes five distinct components: instability, clinical judgment, educational needs, emotional support, and physical care needs. Each component includes two to six items, and each item has a potential score from one to three. A level 1 response reflects the lowest requirement for nursing care, while a level 3 response reflects the highest requirement. Item responses are summed to yield a score between 15 and 45 with higher scores reflecting greater nursing care needs. Fulton and Wilden reported internal consistency reliability of .80 and inter-rater reliability of 0.96 when scoring was done by specially trained nurses. Content validation of the PRNC was conducted through expert panel review comprising university nursing researchers and nursing administrators.

### 3.4.2.5 Open-Ended Questions for Focus Group Sessions:

Focus groups were conducted to gain understanding of what the review process was like for those involved. Prepared questions (see Appendix H) were used to guide the discussions; the facilitator directed the discussions as needed and/or clarified or sought more in-depth responses as required.

### 4 Ethical Considerations and Safeguards

All seven participating organizations received approval from their respective Research Ethics Boards prior to collection of data. No information was collected that would reveal the identity of a patient or nurse who participated in the study. Review participants were instructed to refer to patients by initials only. Internal review team members had access to patients’ health records; external review team members did not have access to patient charts.

Verbal consent from each nurse was obtained prior to their participation in the patient reviews. All completed PCNA review forms and other completed tools were collected by the organization lead, and enclosed in a sealed envelope which was stored in a locked cabinet in a locked office.
Focus groups were facilitated by a nurse researcher external to the project. Participation was voluntary and written consent from focus group participants was obtained prior to participation. Any identifying information about participants was deleted from the focus group transcriptions.

5 Procedures

5.1 Unit Reviews

5.1.1 Advance Preparation

The fundamental aim of achieving consensus and involvement of front line nurses guided the evolving structure and process for the unit reviews. Preparation of staff and leaders for each review was conducted in advance of the review days. Presentations at nursing councils, nursing newsletters, unit staff meetings, one-on-one discussions with staff, and E-mail notices were utilized to prepare the front line staff for the reviews. Repeat sessions were conducted as necessary. The advance communication and discussion with the unit staff addressed clarification of the project goals and objectives, myths and misbeliefs about staff mix, review of the RN/RPN scope of practice changes, and the HHR Demonstration Project funding. Unit staff was provided with copies of the PCNA tool and related definitions ahead of the review day.

Practical aspects of the preparation for each review included advanced booking for additional staff, booking the room for the review, ordering catering, coding and photocopying tools (PCNA tool for each patient and each reviewer, list of definitions, several copies of PRNC Fulton & Wilden tool, PCNA opinion questionnaire in a plain manila envelope for each staff and leader to complete, and a copy of the UEP tool for the clinical manager). In addition the plans for when and where to meet the external reviewers were confirmed.

5.1.2 Day of the Review

The unit-based review team membership included the nurse caring for each patient, the team leader/charge nurse, the clinical manager and the advance practice nurse or clinical educator. Each organization determined the appropriate membership of the review team; however in every case the patient’s assigned nurse was part of the review team. External reviewers included site project coordinators, nursing directors or nursing leaders from within each organization who were not working on the patient care unit at the time of the review.

The review process was facilitated by a member of the external review team. External reviewers received advanced coaching on the facilitation processes. A project leader was present during the first review at each site.

Reviews were conducted according to the principles for achieving respectful engagement as outlined previously. The definitions for stability, complexity, predictability and risk (see Appendix I) were reviewed with the team members as needed to facilitate scoring. Members of the unit review team were able to access the patient health record to assist in determining the appropriate answer for questions.
On the review day, at a time that was convenient to the unit and as early as possible in the morning, the review team members met in a suitable location on the unit. The unit leader or designate printed the census and organized the staff for attending the review. The external reviewers and internal reviewers met briefly before starting the day to decide who would scribe and who would pose the questions. The Charge Nurse coordinated the clinical nurses’ participation in the review as they were available.

The facilitator introduced all members and noted the purpose of the review following the guidelines in the introductory script (see Appendix J). The facilitator acknowledged any potential “power” differentials openly, reinforcing that the purpose of the data collection on the review day was to test the tool. The process of reviewing each patient using the PCNA tool and the consensus approach were explained as well as the intent to conduct the review a second time within the following week or so. In setting the context the facilitator emphasized that the intent was to understand the needs of each patient based on the tool and that it was not an assessment of the nurse. The value of multiple perspectives on the patients to ascertain the best answers to each question was also explained. Staff were reminded to maintain patient confidentiality and that the external reviewers should not know the name of the patient. The facilitator confirmed that the staff nurse understood the study and asked if she/he had any questions. Before starting with the first patient the nurse was told that one external reviewer would record the answers and the facilitator offered to read out each question for the first patient. The facilitator checked if the nurse had any questions after finishing the first patient.

The tool was then applied systematically to each of the patients assigned to the staff nurse member of the review team. The facilitator read each item aloud and invited input and discussion from the review team members regarding an appropriate response to the item. Through discussion, the group came to consensus on the scoring for each item on the tool. The consensus response to each item was documented on the PCNA tool by the designated lead or one of the other external review team members.

Upon completion of review of her/his assigned patients, each staff nurse was provided with an envelope containing the PCNA Opinion Questionnaire. The nurse was invited to complete it anonymously, and return the form (completed or not) to a designated collection box at the Main Nursing Desk. Following the review of the first nurse’s group of patients, the next nurse was requested to join the review. This procedure was repeated until all the patients on the unit that day were reviewed with the PCNA tool.

At each site, the lead collected all the completed PCNA tools, photocopied them, locked the originals in a filing cabinet in their office, and forwarded the photocopies by secure mail to the Project Coordinator who coordinated data entry and analysis.

At the end of the review day the internal review team was asked whether or not the day of review was a “typical day”. This was recorded on the End-of-Day Review Summary sheet (see Appendix K). This process was then repeated on Day 2, which occurred at least one week after Day 1. On day 2 a copy of the PCNA Opinion Questionnaire was given to those staff nurses who had not been surveyed on Day 1.

At the end of Day 2, the designated lead provided a copy of the PCNA Opinion Questionnaire to remaining internal reviewers to complete and return the questionnaire in the same manner. All envelopes were collected on the day following review Day 2 and forwarded to the Project Coordinator.
5.1.3 Application of the Patient Requirements for Nursing Care Tool

For the purposes of convergent validity testing of the PCNA tool a subsample of 3 randomly selected patients per unit were also assessed with the Patient Requirements for Nursing Care (PRNC) tool on Day 1 of the reviews across all hospitals. Two assessments were conducted on these patients, one with the PCNA and one with the PRNC instrument. In half of the patient reviews the PCNA assessment was conducted first, followed by the PRNC assessment. In the other half the order of application of the tools was reversed. Although Fulton and Wilden (1998) evaluated the PRNC using the patient’s record as the data source, in the present study the PRNC was completed in the same manner as the PCNA, using a consensus-based team review process. The PCNA and PRNC forms were coded to enable comparison of information from the two forms.

5.2 Administration of the Unit Environment Profile:

The methodology to support the testing of the UEP tool involved application and critique of the tool by managers from 36 adult inpatient medical/surgical units across seven acute care hospitals in Ontario. Each manager was provided the UEP on Day #1 of the review process, with direction that it be completed only once and no later than 2 weeks after the review team completed Day#2 of the patient reviews.

5.3 De-briefing Meetings with Patient Care Unit Nursing Leaders:

After completion of the two days of review on each unit and prior to the focus groups, a member of the external review team met individually with each unit's nursing leaders at their organization. At that time, the results of the Day 1 and Day 2 review were provided in a standardized template developed by Hamilton Health Sciences to the nursing leaders, noting the care needs of the patients on each day. The results of the UEP were also presented, if available. Collectively, the PCNA tool and the UEP tool data were discussed with the nursing leaders in an effort to understand the meaning and application of these results for the leaders’ specific unit nursing staff-mix planning. After consultation and discussion, the unit nursing leaders were invited to voluntarily summarize their thoughts by independently completing a the Questionnaire for Unit Nursing Leader (QUNL). Unit leaders were instructed to place the questionnaire, completed or not, in a sealed envelope and place it in a designated collection box for retrieval by the Project Coordinator. Completion of the QUNL indicated consent.

5.4 Focus Groups for Review Team:

Focus groups were conducted with nurses who had participated in the reviews after all designated units had conducted their two-day review process. A total of 15 focus group sessions were conducted. Two sessions occurred at each site with the exception of SHSC, where 3 focus groups were held. All internal reviewers and external reviewers were invited by e-mail or hard copy letter (see Appendix L) to participate in the focus groups to elicit their perceptions of and reactions to the instruments and review process. Participation in the focus groups was voluntary.

The focus groups were led by an experienced facilitator who was not part of the project team. The sessions were audio taped and transcribed verbatim. Transcripts were compared with the written notes for accuracy. The open-ended questions that were presented to the group of participants for consideration and discussion are outlined in Appendix H.
5.5 Full-Day Review Meeting:
After the review sessions, focus groups, and debriefing meetings were completed across the organizations and the data from these sources had been analyzed, the Project Steering team met for a full-day review meeting. Prior to the meeting, each site was asked to prepare independently a summary document outlining what their experiences had been, and what key lessons were learned. These summaries were shared electronically with all members in advance of the meeting. The discussions during the review day were informed by the individual site summaries of learnings as well as data from the focus groups, statistical analysis of the PCNA, and questionnaires. The review meeting was led by an experienced facilitator external to the study process. A summary of key learnings from the project was distilled from these discussions.

5.6 Data Analyses:
Responses from the PCNA tool were entered into an Excel spreadsheet and submitted to the Institute for Clinical Evaluative Studies for analysis. Responses to the yes/no items (questions 2 through 10) were dummy-coded for this analysis, with “yes” responses coded as 1 and “no” coded as 0. Questions where a “yes” response reflected a favorable patient condition, that is questions 2a, 2b, 3a, and 3b, were reverse coded so that all scores operated in the same direction. A random check for data quality was conducted to ensure accuracy of data entry.

PCNA data were analyzed using SAS Version 9.1.3. Frequency counts were done for nominal and ordinal PCNA data. Descriptive statistics (mean and standard deviation) were calculated for all continuous variables on the PCNA and the PCNA and UEP Opinion Questionnaires.

Inter-item and internal consistency reliability coefficients were calculated for PCNA data using standard statistical procedures for continuous and dichotomous variables. Correlation analysis was also conducted to compare PCNA and PRNC data.

Focus group data and responses to open-ended questions on the Questionnaire for Unit Nursing Leaders, PCNA and UEP opinion questionnaires were analyzed for themes. Thematic analysis was also used to elicit key lessons learned during the full-day research team review meeting.

6 Results
In this section results of the data analysis of the instruments and review and decision processes are presented. The data findings are organized into the following sections: Patient Care Needs Assessment (PCNA) tool; Unit Environment Profile; Unit Review Process and, Staff Mix Decision Processes.

6.1 Results Related to the Patient Care Needs Assessment Tool:

6.1.1 Descriptive Results of Patient Care Needs Assessment Reviews:
Patient reviews with the Patient Care Needs Assessment (PCNA) document were conducted on 2069 individuals in 36 inpatient units across seven acute care hospitals in Ontario, using a consensus-based team review approach. The number of reviews by site is detailed in Appendix M. Slightly more than one-third of the patient reviews were conducted at SHSC.
Question 1 asked for summary information about the patient’s relevant history and current nursing care needs and priorities.

Questions 2a through 10 on the PCNA tool used a yes/no response format, with the exception of question 2c, frequency of vital signs measurement. As noted in Table 1, questions that addressed anticipation of complications, need for adjustment in the plan of care, presence of high risk interventions, unexpected events, complex patient or family needs and/or decisions showed the most balanced distribution between “yes” and “no” responses. The questions related to vital signs within predetermined limits and level of consciousness within expected range elicited positive responses in over 90% of the patient reviews. Similarly almost all patients were assessed as having no fluctuations in level of consciousness at the time of the review. This suggests that these latter questions may be less effective than other items in discriminating among patient care needs.

Table 1
Response Frequencies for PCNA Questions 2 – 10

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Question</th>
<th>Response</th>
<th>Frequency (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a</td>
<td>Have the patient’s vital signs been within the following criteria over the last 24 hour period?</td>
<td>Yes</td>
<td>1894 (91.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>170 (8.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not applicable</td>
<td>5 (0.2)</td>
</tr>
<tr>
<td>2b</td>
<td>Are the patient’s vital signs within the expected range for this patient’s condition?</td>
<td>Yes</td>
<td>1797 (87.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>264 (12.8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not applicable</td>
<td>5 (0.2)</td>
</tr>
<tr>
<td>3a</td>
<td>Is the patient’s current level of consciousness within expected range for her/his condition?</td>
<td>Yes</td>
<td>2013 (97.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>55 (2.7)</td>
</tr>
<tr>
<td>3b</td>
<td>Is the patient currently experiencing fluctuations in level of consciousness?</td>
<td>Yes</td>
<td>169 (8.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>1900 (91.8)</td>
</tr>
<tr>
<td>4</td>
<td>Does the patient require increased monitoring for development of complications? (For example, you are worried about the health of this patient and are keeping a close eye on him/her)</td>
<td>Yes</td>
<td>1096 (53.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>972 (47.0)</td>
</tr>
<tr>
<td>5</td>
<td>Has the patient been experiencing acute confusion/agitation requiring ongoing assessment and treatment?</td>
<td>Yes</td>
<td>321 (15.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>1746 (84.5)</td>
</tr>
<tr>
<td>6</td>
<td>Does the patient’s condition require increased assessment and adjustment in the plan of care? (For example, due to pain, fluctuating lab results, persistent fever, loss &amp; grief, fluctuating mood, blood glucose is not well controlled)</td>
<td>Yes</td>
<td>1177 (56.9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>892 (43.1)</td>
</tr>
</tbody>
</table>
Does the patient require interventions/treatments that will have an immediate systemic effect, which may create an urgent or emergent situation? (For example, new IV treatment, Heparin infusion therapy, chemo therapy, high alert drug treatment, first-time blood transfusion)

Yes 618 (29.9)
No 1451 (70.1)

In the last 48 hours, has the patient had an unexpected health event or crisis? (For example, severe or acute episode requiring immediate intervention such as a sudden drop in blood pressure, O2 saturation level, blood glucose, fall)

Yes 731 (35.4)
No 1336 (64.6)

Do the patient and/or family have complex support needs?

Yes 1233 (59.6)
No 836 (40.4)

Are the patient and/or family facing complex decisions that require coordination/collaboration with multiple team members?

Yes 1172 (56.7)
No 897 (43.4)

Frequency of vitals signs measurement ranged from continuous monitoring of vital signs to once every 24 hours ($M = 6.76$ hours, $SD = 3.13$). More than half of the patients reviewed required monitoring of vital signs more frequently than every 8 hours.

Items 11 through 14 on the PCNA questionnaire assessed the patient on the dimensions of stability, complexity, predictability, and risk for negative outcomes. These were measured on a 6-point Likert-type scale, with lower values corresponding to more stable, less complex, more predictable, and lower risk patients. Initially it was intended that patient scores on these items would be indicated in whole numbers. However in conducting the reviews, it became evident that some review teams had difficulty choosing between two consecutive numbers on one or more dimensions for some patients. In these situations review teams assigned the midpoint between the two numbers. For example if a review team was unable to reach consensus on a rating of either 3 or 4 for a patient, a score of 3.5 was assigned. As demonstrated in Table 2 and Figure 1, the largest number of responses in each dimension was in the middle range (2.1 – 4.0) with fewer patients assessed at the higher and lower extremes of the scales.
6.1.1.1 Internal Consistency Assessment of the PCNA Tool:

A number of analyses were conducted to assess the internal consistency of the PCNA tool. For this analysis the responses to question 2c (frequency of vital signs measurement) were converted to a dichotomous variable: vital signs measurement was classified as either more frequently than every eight hours (assigned a value of 1) or less than or equal to every eight hours (scored as a 0). The selection of an 8-hour interval was chosen as the cut point because several of the participating organizations reported that this was the “routine” frequency in medical-surgical units. Thus measurement of vital signs more frequently than every 8 hours reflected a decision that the patient required more than routine monitoring.

6.1.1.2 Reliability of the Yes/No Items:

Cronbach’s alpha coefficient was calculated for the yes/no portion of the PCNA tool, comprising questions 2 through 10. The alpha coefficient for this section of the tool was .70, which is within the acceptable range for an instrument in the initial stages of development (Nunnally, 1978). Questions 3a and 3b related to level of consciousness showed the lowest correlations with the other items. Therefore the internal consistency coefficient was also calculated for the tool after removing questions 3a and 3b. The alpha coefficient for the tool with the two items removed was unchanged at .70.
6.1.1.3 Relationship between Yes/No Items and Dimension Scales:

The PCNA instrument was developed with the intention that the yes/no questions would be asked first and that the process of addressing these questions would facilitate development of consensus on the subsequent ratings of stability, complexity, predictability, and risk for negative outcomes. To assess the appropriateness of this assumption the relationships among these two categories of questions were examined.

Polychoric correlation coefficients were computed to assess the relationship between the dimension scores for stability, complexity, predictability, and risk for negative outcomes and the individual yes/no questions (2a through 10, excluding 2c). As demonstrated in Table 3, the items that were most strongly associated with both patient stability and predictability were those that assessed the need for more frequent monitoring for complications, and reassessment and revision to the patient’s plan of care (Questions 4 and 6 respectively). Complexity was most closely aligned with questions related to revision of the plan of care, patient and family support needs, and decisions that the patient and/or family were facing (Questions 6, 9, and 10). Correlations for all of these relationships were .60 or higher. Inter-item correlations for the dimension risk for negative outcomes were generally lower than for the other dimensions; however items 4, 6, 7, 9 and 10 (increased monitoring, increased adjustment in the plan of care, high risk interventions, support needs, and complex patient or family decisions) were all correlated with risk for negative outcomes at r values of .50 or higher.

Table 3  
Correlations between “Yes/no” Questions and Dimension Scales

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Question focus</th>
<th>Stability (Qu. 11)</th>
<th>Complexity (Qu. 12)</th>
<th>Predictability (Qu. 13)</th>
<th>Risk for Neg. Outcomes (Qu. 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a</td>
<td>Vital signs within established limits</td>
<td>.32</td>
<td>.21</td>
<td>.25</td>
<td>.18</td>
</tr>
<tr>
<td>2b</td>
<td>Vital signs within range for condition</td>
<td>.49</td>
<td>.40</td>
<td>.38</td>
<td>.31</td>
</tr>
<tr>
<td>3a</td>
<td>Level of consciousness within range for condition</td>
<td>.32</td>
<td>.26</td>
<td>.23</td>
<td>.18</td>
</tr>
<tr>
<td>3b</td>
<td>Fluctuations in level of consciousness</td>
<td>.33</td>
<td>.32</td>
<td>.30</td>
<td>.31</td>
</tr>
<tr>
<td>4</td>
<td>Increased monitoring for development of complications</td>
<td>.63</td>
<td>.53</td>
<td>.60</td>
<td>.55</td>
</tr>
<tr>
<td>5</td>
<td>Acute confusion/agitation requiring ongoing assessment and treatment</td>
<td>.29</td>
<td>.35</td>
<td>.35</td>
<td>.34</td>
</tr>
<tr>
<td>6</td>
<td>Increased assessment and adjustment in the plan of care</td>
<td>.64</td>
<td>.60</td>
<td>.60</td>
<td>.53</td>
</tr>
<tr>
<td>7</td>
<td>High-risk interventions/treatments</td>
<td>.56</td>
<td>.49</td>
<td>.53</td>
<td>.50</td>
</tr>
<tr>
<td>8</td>
<td>Unexpected health event or crisis in past 48 hours</td>
<td>.45</td>
<td>.24</td>
<td>.38</td>
<td>.25</td>
</tr>
<tr>
<td>9</td>
<td>Complex support needs</td>
<td>.44</td>
<td>.63</td>
<td>.50</td>
<td>.56</td>
</tr>
</tbody>
</table>
Item 2a “Are this patient’s vital signs within the following limits?” and item 3a “Is this patient’s level of consciousness within the expected range for her/his condition?” had the weakest relationship with complexity, predictability, and risk for negative outcomes. These items also had relatively low correlations with stability, although the weakest association with stability was for question 5 “Has the patient been experiencing acute confusion/agitation requiring ongoing assessment and treatment?”

The consistency of the yes/no questions (items 2 through 10) with the scores on the individual dimensions of stability, complexity, predictability, and risk for negative outcomes was also analyzed by comparing the total score for the yes/no questions to the scores on each of the dimension scales. While the PCNA tool is not intended to yield a total score for the purpose of identifying patients’ needs for nursing care, comparison of the sum of the yes/no items to each of the dimension scales provided insight into the extent to which the process of answering questions 2 through 10 supports the determination of the ratings on the four dimensions. After coding the responses to items 2 through 10 as previously described, a total score of the yes/no questions was calculated for each patient. Spearman’s correlation coefficients were then calculated for the relationship between the total of scores on questions 2 through 10 and each dimension score. As the correlation coefficients displayed in Table 4 suggest, there is a strong positive relationship between the overall assessment revealed in the total score of items 2 through 10 and each of the four dimensions. In each case the coefficients are significant and greater than .62.

Table 4
Relationship between Total of Yes/no Questions and Patient Stability, Complexity, Predictability, and Risk for Negative Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Stability (Spearman r)</th>
<th>Complexity (Spearman r)</th>
<th>Predictability (Spearman r)</th>
<th>Risk for Negative Outcomes (Spearman r)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stability</strong></td>
<td><strong>.67</strong>**</td>
<td><strong>.66</strong>**</td>
<td><strong>.66</strong>**</td>
<td><strong>.62</strong>**</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td><strong>.72</strong>**</td>
<td><strong>.75</strong>**</td>
<td><strong>.74</strong>**</td>
<td><strong>.79</strong>**</td>
</tr>
</tbody>
</table>

**6.1.1.4 Relationships among Dimension Scores:**

Finally, Spearman correlation coefficients reflecting the relationship among the four dimensions of stability, complexity, predictability, and risk for negative outcomes were computed. All of these dimensions were strongly correlated, with r values ranging from .67 to .79 (see Table 5).

Table 5
Correlations Between Stability, Complexity, Predictability, and Risk for Negative Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Complexity</th>
<th>Predictability</th>
<th>Risk for Negative Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stability</strong></td>
<td><strong>.72</strong>**</td>
<td><strong>.75</strong>**</td>
<td><strong>.67</strong>**</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td><strong>.74</strong>**</td>
<td><strong>.79</strong>**</td>
<td></td>
</tr>
</tbody>
</table>
Predictability .77****

**** p < .0001

In addition to assessing reliability, the validity of the PCNA instrument was also examined. These results are discussed in the following section.

6.1.2 Validation of the Patient Care Needs Assessment Tool:

Validity refers to the extent to which we can be confident in the inferences made about the needs of patients based on their scores on the PCNA tool (Norman & Streiner, 2008). Both face and content validation procedures were conducted.

6.1.2.1 Face Validity of the Patient Care Needs Assessment Tool:

Face validity means that the instrument, on the face of it, measures the construct of interest. This type of validity provides insights into how potential participants might interpret and respond to the items (Trochim, 2001). Face validity of the final PCNA tool was assessed during the unit reviews through the Patient Care Needs Assessment Opinion Questionnaire (PCNAOQ) and focus group comments.

The PCNAOQ asked seven questions on a scale of 1 – 3 with one indicating “not at all” to three indicating “very much so”. Responses are summarized in Table 6.

Table 6
Mean Responses from the PCNAOQ

<table>
<thead>
<tr>
<th>Question Focus</th>
<th>Mean Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehensively captures patient complexity</td>
<td>2.4</td>
</tr>
<tr>
<td>Captures patient predictability</td>
<td>2.4</td>
</tr>
<tr>
<td>Captures patient risk for negative outcomes</td>
<td>2.3</td>
</tr>
<tr>
<td>Instrument clear and understandable</td>
<td>2.4</td>
</tr>
<tr>
<td>Instrument easy to use</td>
<td>2.4</td>
</tr>
<tr>
<td>Instrument practical</td>
<td>2.3</td>
</tr>
<tr>
<td>Items missing from the instrument</td>
<td>1.9</td>
</tr>
</tbody>
</table>

The comprehensiveness of the PCNA was summed up by focus group participants:

*We went through the patients that I had that day, and a lot of those criteria met my patients’ needs, and I felt it gave a reflection of my patients that particular day.*

*It’s a pretty broad scope. It encompasses everything.*

*I think it is comprehensive in terms that you’re getting input from a variety of sources versus just it being like on a management level or a senior team level, it’s actually asking the nurses.*

Although the PCNAOQ results and focus group participants suggest that a substantial degree of face validity has been established, respondents provided a number of insightful comments and suggestions about how PCNA 11 may be further enhanced:
Narrowing the vital sign parameters and including temperature:
   *I don’t think I agree with the numbers they’ve chosen for the parameters. I think they’re too extreme.*
   *I think we always think of temperature as part of the vital signs.*

Clarification of confusion versus level of consciousness:
   *A lot of times the staff were confusing level of consciousness with confusion. There is a question about acute confusion, but I think a lot of them, when they’re thinking of level of consciousness, they weren’t really thinking of drowsiness versus alert.*

Clarification of examples of interventions/treatments that will have an immediate systemic effect, which may create an urgent or emergent situation:
   *First time blood transfusions, every time you are giving them a transfusion it is a risk.*

Clarification of the question “In the last 48 hours, has the patient had an unexpected health event or crisis?”
   *Some things you can describe as an unexpected event, but I wouldn’t necessarily say that it’s a crisis. So it seemed like you were asking two different things. When the patient came into emerge, if they had unexpected surgery – is that a specific intervention for someone who came to emerge and had to have surgery?*

Define complex supports:
   *Sometimes the family situation, their living arrangement, was what made them so complex. They lived on the street or they were from far away.*

   *The other issues is some of the ethical issues that come up from time to time. You spend a lot of time looking at different situations, end-of-life care, to treat or not to treat a patient, family members that are upset because their loved one.*

   *A question I heard quite often was, is this educational support that we would give to every patient, or when we say complex, are we differentiating between the educational support that we typically provide, which is quite intense, versus additional on top of what we would usually provided.*

   *I’m thinking about psychological, social-psych issues that we came across with a lot of patients and families. We couldn’t really capture it.*

Define negative outcomes and provide a time frame:
   *A very important point about this question is how at risk is this patient for negative outcome? Because what is negative outcome? Because when a person is expected to pass away, that can be positively accepted by the family.*

   *I think that was a bit of a challenge. I think that in cardiac surgery, from our past experience, we would say that a lot of patients are still at risk for negative outcomes, because although they have gone home that doesn’t mean they*
don’t have negative outcomes at home. We still see things happen and it was a little bit of a struggle I think to come to consensus on this.

We didn’t like this question because does that mean tomorrow or a year from now?

6.1.2.2 Convergent Validity Assessment of the PCNA Tool:

Convergent validation of the PCNA was performed by comparing PCNA results with those produced by another instrument. Because these two instruments purported to measure the same construct, it was expected that the two instruments would yield similar assessments of an individual patient’s nursing care needs. Comparison of the results generated by the two tools thus provided information regarding the validity of the inferences drawn from the PCNA data about patients’ needs for nursing care; that is convergent validation (Streiner & Norman, 2008).

Convergent validity testing of the PCNA tool was conducted on a subsample of 106 randomly selected patients on Day 1 of the reviews across all hospitals. Although Fulton and Wilden (1998) evaluated the PRNC using the patient’s record as the data source, in the present study the PRNC was completed in the same manner as the PCNA, using a consensus-based team review process.

The Spearman correlation coefficient for the summary scores from the two instruments was .63 ($p < .0001$), indicating considerable congruence between the results generated by the two instruments in the 106 patients reviewed. Correlations between individual items on the PCNA and PRNC provide further insight into the areas in which these instruments yielded similar and differing results. These results are outlined in Table 7.

Table 7
Comparison of Individual Item Results from Patient Care Needs Assessment and Patient Nursing Care Requirements Instruments

<table>
<thead>
<tr>
<th>PCNA Question No.</th>
<th>PCNA Question Focus</th>
<th>PRNC Question No.</th>
<th>PRNC Question Focus</th>
<th>Polychoric Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>3b</td>
<td>Fluctuations in level of consciousness</td>
<td>2</td>
<td>Alertness, ability to respond</td>
<td>.70</td>
</tr>
<tr>
<td>4</td>
<td>Increased monitoring for development of complications</td>
<td>7</td>
<td>Analysis of condition/symptoms required</td>
<td>.65</td>
</tr>
<tr>
<td>5</td>
<td>Acute confusion/agitation</td>
<td>6</td>
<td>Disorientation, impaired comprehension, inappropriate behaviour</td>
<td>.68</td>
</tr>
<tr>
<td>6</td>
<td>Increased assessment and adjustment in the plan of care</td>
<td>8</td>
<td>Problem-solving, decision-making, alternations to care required</td>
<td>.60</td>
</tr>
<tr>
<td>9</td>
<td>Patient/family complex support needs</td>
<td>9</td>
<td>Complex discharge planning</td>
<td>.62</td>
</tr>
<tr>
<td></td>
<td>Complex decisions that require coordination/collaboration with team</td>
<td>9</td>
<td>Complex discharge planning</td>
<td>.73</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------------------------------------</td>
<td>----</td>
<td>-------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>10</td>
<td>Complex decisions that require coordination/collaboration with team</td>
<td>13</td>
<td>Patient/family conferencing required</td>
<td>.64</td>
</tr>
<tr>
<td>11</td>
<td>Stability</td>
<td>7</td>
<td>Analysis of condition/symptoms required</td>
<td>.62</td>
</tr>
<tr>
<td>11</td>
<td>Stability</td>
<td>8</td>
<td>Problem-solving, decision-making, alternations to care required</td>
<td>.62</td>
</tr>
<tr>
<td>12</td>
<td>Complexity</td>
<td>8</td>
<td>Problem-solving, decision-making, alternations to care required</td>
<td>.63</td>
</tr>
<tr>
<td>13</td>
<td>Predictability</td>
<td>7</td>
<td>Analysis of condition/symptoms required</td>
<td>.62</td>
</tr>
</tbody>
</table>

Note: Only correlations that achieved statistical significant \( p < .05 \) and a correlation of moderate strength \( r > .06 \) are reported.

As expected, items in the two instruments that were similar in focus yielded high correlation coefficients. These included items that addressed level of consciousness, confusion or disorientation, need for increased monitoring and adjustments to the plan of care, and supporting patients and/or families including conferencing and decision-making. In addition the stability dimension score on the PCNA was associated with the need for analysis of condition and problem-solving items on the PRNC. The PCNA measurement of complexity was also associated with problem-solving on the PRNC, while predictability (PCNA) was associated with need for analysis of condition (PRNC).

The PCNA dimension “risk for negative outcomes” did not exhibit significant correlations with any of the PRNC items. Conversely, PRNC items that were more task-focused (number of systems requiring assessment, number of medications, treatments and dressings, provision of education and counseling, and physical care needs) were not correlated strongly with any of the PCNA items.

### 6.2 Results of the UEP Tool Testing:

This section details the feasibility and validity testing of the UEP tool. Reliability testing was not deemed appropriate for this particular tool as the tool was not designed as a measurement to be scored, but rather as framework to be populated with unit descriptors.

#### 6.2.1 Feasibility Testing:

Information regarding the feasibility of applying UEP was obtained form the UEPOQ, QUNL, and focus group data.
Two questions on the Unit Environment Profile Opinion Questionnaire (UEPOQ) were targeted to examine ease of use of the tool and its practicality. The responses provided by the seven (7) managers who participated (response rate = 19%) are presented in Table 8, and provide some indication that application of the tool was moderately acceptable but again must be viewed cautiously given the low response rate.

Table 8

**Results of UEPOQ Regarding Feasibility (n=7)**

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Is the tool easy to use?</td>
<td>2.17</td>
<td>0.75</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2) Is the tool practical?</td>
<td>2</td>
<td>0.63</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Scale: 1=not at all, 2=somewhat, 3=very much so

Feasibility was also determined from several qualitative approaches. The UEPOQ included an open-ended question to elicit ‘any additional comments’ participants might have regarding the tool that the closed-ended questions did not address. Of the responses received, two were linked with feasibility and included:

*Enjoyed the process*

*Time-consuming to do the tool; could not do it on a daily basis but could repeat it if unit was to change.*

The QUNL distributed after the Unit Debriefing meetings, also provided opportunity for nursing leaders to comment on the feasibility of the UEP tool if they wanted to address this feature. In reviewing the sixteen completed questionnaires, feasibility of the UEP was not identified as either a hindrance or enabler.

Finally, the focus groups provided an additional forum for participants to discuss the use and practicality of the UEP tool. Given the focus group sessions included participants who had not completed the UEP tool, responses regarding its application were limited. One key theme linked with feasibility was identified.

Site difference in the data provided:

*Some managers have those stats, so I guess it differs from organization to organization, who keeps them. Well a good thing came from it actually, because some of that information that we weren’t getting we are now getting.*

Overall, based on all the responses received, both qualitative and quantitative in nature, there is limited support for the feasibility of the tool. Results suggest further review is required to determine
the necessary variables that can realistically be collected by managers in a timely-manner, to ultimately facilitate the ease of application of this tool.

6.2.2 Face Validity Analysis:

Face validity of the UEP was evaluated based on responses from nurse managers to the UEPOQ and QUNL, as well as comments made during the focus groups.

Of the thirty-six (36) managers eligible to complete the UEPOQ, seven (7) managers participated (response rate=19%), and those seven represented four of the seven participating organizations. Results are presented in Table 9.

Table 9
Results of UEPOQ Regarding Face Validity (n=7)

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Does this tool comprehensively capture the dynamics of your clinical unit?</td>
<td>2.4</td>
<td>0.55</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2) Does this tool capture whether the unit is predictable?</td>
<td>1.9</td>
<td>0.74</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3) Does this tool capture whether your unit is stable?</td>
<td>2.08</td>
<td>0.80</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4) Is there any item missing from the tool?</td>
<td>1.8</td>
<td>0.84</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

*Scale: 1=not at all, 2= somewhat, 3=very much so*

These results must be viewed cautiously given the low response rate, but provide some indication that the respondents were moderately satisfied that the UEP tool was capturing some of the elements of interest to determine environmental complexity as seen in the average score of 2 for all for questions.

The UEPOQ also included a final open-ended question providing opportunity for participants to voice any additional specific comments they might have regarding the UEP tool. These responses primarily focused on additional items that participants believed were lacking from the tool and should be included to paint a complete picture of the unit environment in order to support staff-mix decision-making. In addition, there was indication some participants were viewing the tool to assist with staffing levels, despite the fact the tool was not designed with this purpose in mind.
Summary of Responses of the Open-ended Question from the UEPOQ:

Suggestions for inclusion:

Perhaps overall experience level of nurses would be helpful.

Have a stepdown unit within this unit.

…overflow of other services.

Does not capture special circumstances of unit, e.g. RN essentially ‘leaving unit’ to cover in observation area on unit for other nurse; …does not reflect number of hours RNs and RPNs must be off site with patients for tests and resulting amount of time that other RNs/RPNs must cover for that nurse’s other patient.

Tool does not reflect other limited resources; no in house medical coverage; no pharmacy after hours, etc.

Complexity of special skills required on unit, i.e. at least two RNs every shift with cardiac monitoring skills.

Does not capture fluctuating census; does not capture percentage of times that we are over/under census and impact that this has on staffing.

Suggestions for Exclusion:

Education level realistically would not change.

Occupancy rate does determine staffing levels, but not staff-mix.

Use of care pathways/politics, etc., does not contribute to staffing staff mix decisions.

Total number of patients and casual staff irrelevant as number of hours actually worked is not captured (some staff works one shift/month).

General comments:

It gives the environment of the unit but not implication of patient acuity and changing needs.

Tool not useful in determining number of staff for floor or staff mix for unit.

Sixteen Unit Nursing Leaders, including directors, managers, educators, charge nurses and advanced practice nurses who attended the debriefing meetings also completed the Questionnaire for Unit Nursing Leaders. Of the sixteen completed questionnaires, few specifically addressed the UEP tool, however the following summary highlights comments that reflect components that were captured in the tool and/or describe elements of the environment that nursing leaders believe are important considerations. Themes that were repeated from the UEPOQ included the issue of stepdown units within a unit and the need to consider this impact, and the need to factor in time and support for nurses caring for patients during ‘offsite’ testing.
Summary of Responses from the Questionnaire for Nursing Unit Leaders:

The following elements were highlighted as key additional considerations for decision-making, that were either included in the UEP or would need to be added: Suggestions included workload evaluation, number and condition of admissions, discharges and transfers, inclusion of stepdown units or case mix groups, and staff turnover as well as unpredictable procedures such as transporting patients for testing or time-consuming items:

…medication not delivered by pharmacy and subsequent calls, time spent looking for equipment, restocking which at times required going to other wards.

General comments included:

All the questions together capture evidence to facilitate decision making, not 1 or 2 key elements alone.

A greater number of days would allow the process to capture the instability of the environment.

An understanding of the tool’s face validity was also supported by data obtained during focus group sessions Three key themes related to the UEP were identified from the focus groups. These included: 1) suggest using median rather than average; 2) outbreak versus infections; and 3) some questions need to be added, expanded or clarified.

Summary of Responses from the Focus Groups Regarding the UEP

Suggest using median rather than average.

On our unit, for instance, we could have people here for close to a year, and some for 2 days. It might be better to find a median rather than the average – the median isn’t affected by extremes. Sick time and things like that do you want the average or the median?

Outbreak versus infections

It just talks about outbreaks. But they are very different things, outbreaks and isolation patients. And yes, I guess isolation patients would have been something that would have been good to know here. When we think of outbreak, that’s not something that happens regularly, but if you think of infectious diseases, then that’s different because you’re thinking of your isolation patients which we have more frequently as opposed to outbreak. Maybe the word outbreak is a little bit of a skew, because you could have 7 or 8 isolations but not be in an outbreak.

Some questions need to be added, expanded or clarified.

Bed capacity should be captured.

One thing I wasn’t clear on, when it says, description of support on unit, it says ‘manager’, but there was no indication how you should answer that.
One of the questions is number of budgeted bed. Now in our hospital, we do have some unbudgeted beds and I think it’s not just this hospital because in speaking to other hospitals, they do have those kind of emergency beds when there is a big crisis. So that would be something that would impact.

I think the questionnaire that I have to do as a manager asking the number of patients coming from ICU, doesn’t really captured it. Our numbers are actually quite low, because we have a step-down unit on our floor. Perhaps a question such as, ‘Where did your patient come from - was it a pre-op patient, a morning admission program patient, or did the patient come from ICU or from ASU?’ might capture the data.

The other thing is number of nursing students. Because we have a lot of them and nursing students required a lot of staff’s time.

Nurse-patient ratio is going to change depending on the time of the day for inpatient units.

The number of code blue calls in the last 3 months.

Overall, the data from the focus groups echoed similar considerations as that provided by the UEPOQ and QUNL, with suggestion to include additional features such as a question regarding step down units, as well as elements needing clarification (e.g. patient flow issues). As a result, the analyses of the data from all these sources combined provide limited evidence of the tool’s face validity, suggesting a need for further refinement of its content.

6.3 Results Related to Unit Review Process:

In this section results related to the consensus-based review process are outlined. A description of the number and duration of the reviews is presented first. Results related to nurses’ evaluation of the process from the focus groups are presented next, followed by feedback from the nursing unit leaders provided after the debriefing meetings.

6.3.1 Descriptive Results Related to the Reviews:

A total of 72 unit reviews were conducted across 36 medical surgical units between June and October 2008. Each unit held two review days, at least one week apart. The time required for patient reviews was between 5 minutes to 30 minutes, although there were patient reviews that were outside that range. The time required to conduct a full review of all patients on a unit depended on the number of patients, the number of interruptions and delays, how well the nurses knew their patients and the complexity of issues to be discussed.

Of the 72 review days undertaken most were identified as typical days for the unit. Of the 8 reported as not typical, reasons included low census, no discharges, no fresh post operative patients, younger than usual patient population, high number of isolation patients, and short staffing.
6.3.2 Results from the Focus Groups:

115 staff participated in the focus groups including staff nurses, unit managers, and APN/Educators. Clinical nurses and nurse leaders who participated in the unit reviews commented at length on the review process during the focus groups. Five themes related to the process were identified. Three of these related to aspects of the process that were helpful. These were: the collaborative approach; coverage for nurses; and being prepared. Two themes also emerged that described unhelpful aspects of the review process: amount of time and time of day; and feeling anxious or intimidated. A description of each theme with illustrative quotes is provided in the following sections.

The Collaborative Approach
Participants in the focus group said that they appreciated how the collaborative approach supported front line staff who may not have known the patient, that the discussion with other members of the nursing staff provided additional clinical knowledge and assisted in determining the score on the rating scale for stability, complexity, predictability and degree of risk. They stated that the charge nurse had a general idea about what the situation was for most people and was often more informed about family issues. Others stated that:

It wasn’t just the nurse involved, but also the educator and manager and administrator. They were able to help guide some of their answers.

What I experienced was that it was really helpful to work on this as a team, and to come up with a consensus, because sometimes one person was tempted to say, oh yes, this patient is very unstable, and then sometimes in discussing some of the aspects, we came up with a conclusion.

The collaborative process of having more than one colleague in the room I found helpful, especially when trying to determine some questions that were on a rating scale.

Coverage for the Nurses
The additional staffing on the review day contributed to nurses feeling supported and able to take the time to participate in the discussions.

I thought it was very helpful having an extra staff on the unit. The staff feel comfortable with an extra person taking over for them, and you’re not asking the other nurses to take on more patients, then they feel definitely more at ease when they’re leaving their patients.

We on our unit were very fortunate that we were able to book somebody extra so there was a nurse to relieve these guys as they came into the sessions. So they felt at ease that somebody was covering.

Being Prepared
Staff appreciated having information about the purpose of the study, the process and a chance to read the tool prior to the review. The project leaders tried to prepare the nurses about this day and tried to explain that it wasn’t a subjective process, it was going to be objective and that the focus was on knowing the patient’s needs. It helped that we had the questions before. It helped that I’m there on a regular basis so you know the patient. I have a good rapport with the staff; they’re able to come to me to ask questions, to share information.
We actually used the sheet in the staff meeting, and just let everybody practice with one patient. So people were much more comfortable because it wasn’t something brand new to them.

The nurses were very good, like some of them came in before the shift to gather information about their patients.

**Amount of Time and Time of Day**

Staff and leaders found that the amount of time needed for the review was difficult to allocate and that beginning first thing in the morning was hard to accommodate.

*I know, I felt like it was early in the morning, and that’s our busiest time of day. So I think a lot of us felt rushed.*

But timing really is an important thing. Especially when our shifts are organized in such a way that certain tasks are time-sensitive, we need to get that done within a certain period of time, we shouldn’t leave our assessments till 9:30 in the morning.

*When you go through all the questions it helps. But it’s quite broad in perspective, and I think you need to give at least 15 minutes and I think it took at least 15 minutes for each person. I think maybe if this were to be repeated in the future, maybe another time of day will be more appreciated.*

*If I was asked this question when I just started my shift, and I haven’t read the charts, I don’t know the history, I haven’t talked to the family and I haven’t assessed the patient that much, and you ask me these questions. How could I answer you properly, so it takes longer?*

**Feeling Anxious or Intimidated**

Nurses felt anxious that they may not be able to provide the information and did not feel comfortable being asked the questions in front of nursing leaders.

*The staff did say that they felt they were grilled. It was just a bit intimidating to come into a room with a table full of people waiting to hear what they had to say. I mean I think it’s so intimidating to have such a large panel. Because you feel like you’re being interrogated.*

*Probably feeling tested, if you don’t know, then you feel you’re being tested, or it’s an evaluation of you and not your patient?*

Others were concerned about job security and tension about the purpose of the review and future implications.

*I think some of the nurses are afraid that this is going to be cutting down on their jobs, so there was this anxiety because where will we end up? I think there was a bit of confusion in terms of the purpose of the questionnaire - was it an evaluating the tool or was it for staffing ratios on the unit.*
The title RN, RPN Utilization Tool Project was something I thought about. You wonder are they going to put RPNs here; are we analyzing this because we need some of the stuff that we do to be assigned to RPN?

6.3.3 Results from the Questionnaire for Nursing Unit Leaders:

Two themes related to the review process were identified in nursing leaders’ responses to the QUNL: valuing nursing work; and ensuring accuracy of data. These are detailed below.

Valuing Nursing Work
Overall nursing unit leaders talked about the value of the process, how they enjoyed listening to staff present patients, seeing and hearing that caring is still an element of nursing. They reported that they found the process very helpful for discussing skill mix and having involvement in the project.

Ensuring Accuracy of Data
Nursing unit leaders also acknowledged that the consensus approach balanced the subjectivity of the process. Some expressed concern about the subjective nature of some of the questions suggesting that more specific questions would be better. Although the tool did not expressly exhibit bias, the format seemed wide open for bias depending on group numbers, patients, & any other number of potential factors. Recognizing the different knowledge base for RNs and RPNs two nursing leaders suggested conducting a parallel study of RN's evaluating the same patients as RPNs for complexity of patient care needs.

Two respondents indicated that two review days were not sufficient to describe true unit experience, did not feel that the review took place on the right day of the week and commented they would need a larger sample size over more days. Every day there are changing patients’ conditions. A greater number of days would allow the process to capture the instability of the environment. I question if 2 days of data is true representation (particularly the days in question). Days in which there are 8 surgeries and staffing is short are not represented.

6.4 Results Related to Staff-Mix Decision Making Process:
This section presents the data obtained from nurse leaders on study units, providing their perspective of how the tools and the review process could inform decision making about staffing needs. Responses elicited during the focus groups are outlined first, followed by results of the QUNL.

6.4.1 Results from the Focus Groups:
Usefulness for Staffing and Assignments
It was generally agreed that the information provided data to support models of care and to enable monitoring trends over time as well as positive comments about the usefulness of the tool in making appropriate assignments.

I think it would help if you believe there are trends going on in your unit and changes that are going on in you unit, whether it’s the additions of a particular surgeon.

It definitely makes me think more about the patient assignment, and the couple of times when I have been in charge. It made me think about which patient I’m going to assign to who, and is that assignment appropriate for a RPN?
6.4.2 Results from the Questionnaire for Unit Nursing Leaders:
Respondents commented on the usefulness of the process for decision-making, elements they say as key to staff mix decision-making, additional applications for the tool and process, and elements that were missing from the toolkit. These themes are described below.

Usefulness of the Review Process for Decision-Making
Eight respondents indicated that the data and process would shape their decision making for skill mix planning.

I found this extremely helpful in determining the appropriateness of skill mix.

The respondents indicated they would make changes based on the information generated by the tools and review process. The types of changes included: introducing RPNs; increasing RN part time and casual staff numbers; increase RN numbers; increase number of RPNs; changing the number of staff on weekends; and adding unregulated workers. Six respondents indicated that they would not make changes. The reasons given included: two days’ data were not sufficient; the tool did not capture predictability; and there was insufficient information.

Key Elements to Support Decision-Making
Patient acuity was identified as an important consideration in decision-making. Involvement of clinical staff was seen as valuable. Unit leaders also suggested that an acuity-based algorithm and organizational guidelines would assist in day-to-day assignment of RNs and RPNs. None of the respondents identified elements of the unit environment as key in support nursing staff mix decisions.

Additional Applications
There were also comments that indicated the tools and process were helpful in looking at other applications beyond RN/RPN skill mix. One nursing leader suggested that it would be a useful tool to inform the day to day assignments and another that it would inform the types of support required beyond nursing staff mix, such as unregulated workers.

Elements Missing from the Process
Although many respondents indicated there was nothing missing from the process, some nursing unit leaders identified additional considerations needed to inform decision-making. These included: the RN/RPN ratio and availability of RN consultation; education level of RPNs; staff nurses’ understanding of RN and RPN scope of practice; budget requirements; workload equity; and continuity of care. Two respondents indicated the tools and process were helpful, but needed further work.

Tools still contain some grey areas.

Needs to include discussion around workload for RNs including perform patients’ tasks that the RPN can’t perform.

If there is a change in staffing mix the RPN will receive the stable patients leaving the RN with a more unstable patient assignment.
One of my biggest concerns is that the RNs will be left with a workload that contains too many unstable patients with very little predictability.

Miscellaneous Comments

Participants also provided comments not directly related to the decision-making process. In some cases staffing changes had already been implemented. Others noted that staff mix decisions were not made by the unit leader, or that staffing changes had already been made before the review. One expressed an intention to keep number of RPNs and RNs as is. Others raised concerns about maintaining quality of care and patient safety:

The expectation to take a full patient assignment with a more critical level of care required may lead to unsafe conditions and further burn out amongst the RN staff.

An RN might have only 3 more complex patients and the RPN might have 5 stable patients. How would the RN have time to consult with RPN as needed?

We need to do more work on evaluating nurse’s perception of staff mix implication. More consistency is needed as the assignment should not be constantly changes during days etc. to increase patients family aid nurses satisfaction.

The scheduling does not allow for much variation. Therefore when patients’ acuity increases, staffing needs increase but budget does not increase.

Consistent with the information provided on the QUNL, it was noted during the debriefing meetings that the nursing unit leaders focused primarily on the information from the PCNA. In general nursing leaders did not discuss integration of the UEP data into staff mix decisions.

7 Discussion of Results

In this section the results of the analysis of reviews are discussed with respect to the adequacy of the PCNA and UEP tools, the Review Process and, Decision Making Process. Implications for practice and research are also addressed.

7.1 Patient Care Needs Assessment Tool:
The PCNA tool is intended to assess patient’s needs for nursing care based on the stability, complexity, and predictability of the patient’s condition and their level of risk for negative outcomes. The tool is structured so that responses to questions about specific elements of the patient’s situation and plan of care build to an assessment of their levels on each of these four dimensions.

7.1.1 Utility of the Yes/No Questions:
In this study all of the yes/no questions were correlated with the dimension scores, suggesting that each of these questions contributes to the assessment of the patient’s status with respect to stability, complexity, predictability, and risk for negative outcomes. However the magnitude of the correlations between individual items and dimension scores varied considerably. This suggests that the nurses who participated in the reviews were in fact synthesizing disparate aspects of patient situations and
care requirements to form assessments about the stability, complexity, predictability, and risk of the patient’s condition.

Although all yes/no items were significantly correlated with the dimension scores, feedback from participants in the review process suggested that the questions related to vital signs were less useful in illuminating patient care needs, as the vital signs parameters in the tool were too broad. At the same time there were some patients whose vital signs were outside the stipulated limits, suggesting that consideration of vital signs does provide information about the patient’s condition. Participants also suggested that temperature should be included in the vital signs parameters; it was noted that there were several patients in the reviews for whom elevated temperature was a concern. Since overall the response to the vital signs question showed little variability across patient reviews and lower correlations with stability, complexity, predictability, and risk, it is possible that the tool could be improved by narrowing the range for vital signs and including temperature in the parameters.

The questions related to level of consciousness may also warrant review. Almost no patients were identified as having a level of consciousness that was not consistent with the patient’s condition, and these questions were not strongly correlated with the other items. However many of the patients reviewed did have an altered level of consciousness that increased the nursing expertise required. It may be that a question explicitly addressing altered level of consciousness without qualifying the response on the basis of the patient’s existing condition would be more effective in understanding patients’ needs for nursing care. It was also suggested that confusion was not adequately addressed in the tool, and that some individuals and groups had difficulty differentiating confusion from level of consciousness. Thus further refinement of the tool to capture care needs related to altered level of consciousness as well as confusion may enhance its utility.

Several nurses expressed concern about the perceived subjectivity of some of the questions on the PCNA. However they also noted that the consensus process was effective in supporting an objective assessment of patients care needs and enhanced their confidence in the accuracy of the results. These findings underscore the importance of the consensus format of the unit reviews and the importance of effective facilitation of the review process.

### 7.1.2 Dimension Scales:

The distribution of scores across levels of stability, complexity, predictability, and risk supports the utility of the PCNA tool in discriminating among patients with respect to these four dimensions. The majority of patients were assessed in the moderate range, which is consistent with their status as acute care inpatients on medical-surgical units; nevertheless patients in both the lowest and highest acuity categories were identified through the review process. The College of Nurses of Ontario’s three-factor framework (2008) suggests that RPNs are prepared to care autonomously for less complex, more stable and predictable patients who have less risk for negative outcomes, while the greater depth and breadth of the knowledge base of RNs is required to manage the care of more complex, less predictable, higher risk patients. The ability of the PCNA tool to identify those patients who are both more stable, less complex, more predictable, and at lower risk, and those who are at higher levels of instability, complexity, risk, and unpredictability suggests that this instrument can be useful in operationalizing these concepts from the CNO framework to facilitate nursing staff mix decisions.

Several review participants commented on the difficulty they experienced in assigning scores on the dimension scales. They also noted however that the process of answering the yes/no questions prior
to assigning scores on the four dimensions, and the consensus approach to the reviews were beneficial in facilitating scoring. The correlation of individual yes/no items with specific dimensions provides further support for the effectiveness of these items in illuminating salient aspects of patients’ condition that contribute to stability, complexity, predictability, and risk. Of particular note is the strong relationship between complexity and the questions addressing the need for revision of the plan of care, and patient and family support needs. This suggests that the complexity dimension is capturing more than medical acuity; rather complexity is recognized by nurses as a function of the need for nursing judgment, critical thinking and priority setting as well as patient and family needs for advocacy, care coordination, education, and emotional and psychosocial support. The correlation of these items with the complexity dimension reflects an understanding by nurses of the expertise and multiple skill sets that are required to address these needs.

7.1.3 Reliability of the PCNA Tool:

In this study the PCNA tool demonstrated acceptable internal consistency reliability. It was also an expectation that the PCNA would address a number of different aspects of the patient’s condition including physical, psychological and social needs, the degree to which these needs and the corresponding plan of care are changing, and the impact of clinical interventions on subsequent care needs. The variation in the magnitude of the correlations between individual yes/no items and the scores on stability, complexity, predictability, and risk provides support for this assumption. Because of the diversity of needs addressed by the PCNA it was not anticipated that internal consistency would be extremely high. Indeed, Streiner and Norman (2008) suggest that when a scale is measuring a heterogeneous construct, high internal consistency may achieved only at the cost of lower content validity; they suggest that in these situations it is advisable to aim for adequate content validity to support valid inferences and accept a lower internality consistency level. Thus while there is evidence that overall the items on the tool work together to reveal a consistent and integrated picture of patient care needs, the differential relationship of the individual items with the dimension scales provides support for the multi-dimensional nature of these needs. While the strong correlations among stability, complexity, predictability, and risk for negative outcomes suggest that these dimensions are not entirely discreet, the results of the reviews underscore the importance of considering each of the dimensions in evaluating patients’ needs for nursing care.

7.1.4 Convergent Validity:

The validity of the assessments generated by the PCNA was evaluated by comparing these results with those from another instrument, the Patient Requirements for Nursing Care (Fulton & Wilden, 1998) tool. A moderate positive correlation was observed between the summary assessments from the two instruments. Since the Fulton and Wilden instrument was also developed specifically to facilitate determination of the appropriate category of nurse based on the complexity, acuity, and dependency of the patient’s needs, the convergent validity results suggest that the PCNA is effective in eliciting this information. However there were some notable differences as well in results from the two tools.

The PRNC yields a mean score that is intended to provide an index of complexity and stability. Conversely, the PCNA uses a consensus-based process to illuminate each dimension of the patient’s needs explicitly. Consideration of each dimension of a patient’s needs in making decisions about the
appropriate category of nurse may result in a more fulsome assessment and staff mix decision process.

The PRNC tool did not explicitly address the patient’s risk for negative outcomes, and none of the PRNC items demonstrated even a moderate correlation with the risk scale on the PCNA. The College of Nurses of Ontario’s 3-factor framework (2008) includes risk for negative outcomes as one of the patient characteristics to be considered in determining the appropriate category of nurse. Thus a consensus-based review process using the PCNA may provide greater insight into patient factors that impact staff mix decisions.

The PRNC also included measures of the physical care requirements of patients. In addition, some of the items that were intended to address patient stability, requirements for nursing judgement, and emotional and educational needs of patients were measured based on the number or frequency of nursing interventions and actions, or the amount of support required by the patient. Responses to these questions did not correlate strongly with any of the PCNA items or dimensions. It may be that these items on the Fulton and Wilden (1998) tool reflect the workload related to meeting these needs, rather than the knowledge, skill, and judgement required by the nurse. Thus this lack of consistency between the two tools could be considered further evidence in support of the validity and utility of the PCNA instrument in supporting nursing staff mix decisions.

7.2 Unit Environment Profile:

The UEP tool was designed to inform decision-makers of the complexities and dynamics of their clinical practice setting. Complementing the results of the Patient Care Needs Assessment (PCNA) reviews, the vision for the UEP tool was based on the understanding of the necessity to appreciate the context in which nurses practice and by so doing better inform the decisions regarding staff-mix.

Supported by evidence from the literature (O’Brien-Pallas, Irvine, Peereboom, & Murray, 1997; College of Nurses of Ontario, 2008) the tool under study included 41 items with the following domains: personnel characteristics, unit characteristics, and day of the review.

The results obtained from this project shed light on the tool’s purpose and application. Results highlighted the need for clearer articulation of the tool’s purpose and how the data gathered from the tool’s application should be used to guide decision-making. In addition, findings drew attention to the fact that managers and unit leaders struggled to make the link between the environmental factors with patient care needs assessments as part of an overall framework for decision-making. The number of uncompleted UEPs and the low response rates on the UEPOQ may be related to the fact that managers were not clear on the need and intention of the tool, and how it was to be used. As such, greater attention and consideration needs to be dedicated to more formally detailing the purpose of the tool and how it complements the information gained from the patient reviews. This, together with a standardized approach for preparing managers on how to use the tool, would be of benefit.

The results of this study also further illuminated the environmental factors that resonate and offer most meaning for unit leaders, and revealed the need for re-consideration of the tool’s variables with implication for future re-testing to establish a more rigorous, valid tool. There was indication that additional variables and re-formatting of items would add to the validity of the tool, and provide enhanced perspective on the unit dynamics. These components included more comprehensively capturing: 1) bed utilization such as budgeted versus unbudgeted beds including frequency of unbudgeted bed use and the percentage of time over/under census; 2) patient flow characteristics including how patients arrive and are transferred from the unit, as well as circumstances when a nurse is required to be off the unit to support procedural testing or provide care; and 3) ‘off hour’ resource
availability and its impact on the complexity of the work environment. Overall, there was clear indication of the need to re-examine the full scope of variables to best capture environmental complexity. While there was specific request for select additional items, this was also balanced with a need to ensure the tool is manageable and functional.

The results of the testing of the UEP tool also provided further insight into refinement of the tool from a pragmatic perspective. There was consistent support for the need to include definitions for all variables, and provide examples as appropriate, to ensure consistency and clarity regarding the requested data. The study results exposed the issue of different interpretations for various items among respondents, contributing to inconsistencies in the data obtained, and may have also contributed to the difficulty of retrieving the data in some circumstances and resultant lack of completion. A noted repeated example was the unanticipated events section, which could have been completed more consistently if definitions had been provided. In the re-development of this tool, additional strategies to ensure clarity will include the addition of overall instructions for completion and item-specific instructions as needed, as well as avoidance of acronyms.

A key finding regarding the Unit Environment Profile (UEP) Tool related to the application process and accessibility to the requested data. It became apparent that not all participating study sites had easy access to the data that was required for completion of the tool, making the process labor intensive and unnecessarily challenging. It also speaks to the importance of accessibility and recognition that it must not be a barrier. Measures may need to be taken to enable this process to ensure unit leaders have timely access to accurate, relevant data.

The important consideration of environmental factors and complexities as context for staffing-mix decision-making was highlighted in this study. The value of its application was articulated by some leaders as an awareness-raising regarding information that they should and/or could know but had not previously considered retrieving. For others, however, it revealed a need for further discussion and education to facilitate an enriched understanding of how environment in the three-factor framework is a vital determining factor for RN/RPN utilization. This additional finding provides direction for future work in shaping the tool and how its application is communicated.

### 7.3 Review Process:

The characteristics for the review process, drawn from the experiences of the project leaders were based on the belief that through respectful engagement between front line nurses and nursing leaders on the unit the needs of patients could be articulated and agreed upon using the tool. The need for guided facilitation through each question is paramount in order to achieve collaboration and to reach consensus on the rating for stability, predictability, complexity and degree of risk. Many commented on the importance of dedicating time to review what nurses do and know about the patients and families and how impressed they were by the amount of critical thinking that goes on while accomplishing tasks. Although staff nurses said that they were apprehensive about speaking in front of their manager and other nursing leaders before going through the review the majority found that they relaxed as the review proceeded and did not feel intimidated. Project leaders prepared for the role of facilitator through coaching, role modeling and sharing tips to maximize their ability to conduct the reviews. Strategies such as sitting across from the staff nurse enabled direct eye contact and engagement of the staff nurse. The facilitator provided an overview of the project for each new nurse and explained the role of each member at the table including the scribe. The PCNA tool and definitions were provided for everyone. Having the clinical manager or team leader access the chart helped to provide additional information or to check details. The facilitator posed each question, provided time for response by the nurse then checked with everyone else at the table to see if they agreed or if there
was anything else to add. Seeking clarity or providing additional detail by asking questions, summarizing or reading back the notes assisted in accuracy as well as ensuring agreement for each question.

The funding from the ministry supported additional staffing on the day of the review. In most cases an additional staff nurse was booked to relieve each nurse according to a pre-determined schedule so they could organize the hand-over and prepare for their turn. In some cases the team leader or charge nurse was also replaced.

Providing information to the leaders as well as the front line staff is a key strategy recommended for success. It is important to note that the perpetuation of myths, misbeliefs, fear and rumour generation surrounding the project continued in spite of multiple attempts to prepare staff through various modes of communication. Stressing the need for a systematic and broad communication plan has been recognized by the participants across the sites. The project began with a workshop for leaders from each of the partner organizations to provide information about the RPN curriculum, the scope of practice and RN/RPN utilization by the College of Nurses of Ontario as well as an overview of the project goals, objectives and tools. Each site followed the standardized approach to communication as designed by the project team. The methods of communication included written articles, discussion at nursing council, meetings with the nursing leaders, meetings with staff nurses, and distribution of the tool ahead of time.

As an average review for 30 patients took between six and seven and a half hours the ease of having sufficient staffing enhanced the focus on the review rather than worrying about how everyone was coping on the unit. Having a schedule for the staff to know when their turn was coming decreased delays and helped to keep things running on time. Many of the leaders commented on the length of the day and found it difficult to spend so much time in the review. Staff scheduled at the beginning of the day seemed to have the most difficulty especially if they had not cared for the patient on a previous shift. The importance of being informed and prepared for the review represents the professional integrity of the nurse and cannot be minimized.

The expressions of anxiety and intimidation arose across all the units and are deeply rooted in the complexities of nursing socialization and the work environment. The anxiety about being interrogated, of being part of a research project, of not knowing the right answers reflect a great deal about nurse’s vulnerability and fear of being judged. Some nurses were quite visibly nervous and kept looking to their managers or other members of their team for validation in comparison to others, more confident who provided a sound understanding of the clinical and support needs of their patients and families. Observations of the variety of team dynamics provided external reviewers with additional information about the role of leadership on the units indicating how team dynamics, collaboration, decision-making, autonomy and accountability supported professionalism. The role of the facilitator was to support the nurse, steady the pace and involve everyone. Many nurses were sceptical about the project and openly challenged the project team with questions indicating that the true intent was to reintroduce RPN’s in the workplace. The resistance was most evident in units with an all RN staff particularly those who remembered when staffing models changed a decade ago. They perceived the ‘threat’ of having RPNs back in acute care as potentially ‘unsafe, adding to the workload when they had to ‘cover’ the RPN, and as cost saving measures to introduce cheaper workers who if hired could mean job loss for the RN.

Three distinct themes emerged from the debriefing meetings and the Questionnaire for Unit Nursing Leaders. The experience of listening to nurses provided information about nursing work based on
knowledge, critical thinking and experience enhanced the appreciation of the value of nursing. Nursing leaders were impressed by how well the nurses knew their patients and that in spite of the ‘task focus’ that characterizes nursing work, the thinking that supports care is overlooked. Benefits of conducting the systematic review of the needs of each patient pointed out common co-morbidities and complications which will inform future knowledge development. Some areas plan to use the PCNA tool and the review process to develop criteria for patient assignments. Because the tool differentiates patient needs based on levels of complexity, stability, predictability and degree of risk for negative outcomes the framework will aid the application of the College of Nurses of Ontario Guidelines for RN and RPN Utilization (2008).

Concerns about the accuracy of the data that persisted in some areas suggest the need for further unit reviews to establish confidence in the profile of the patient care needs as well as the importance of integrating information from the UEP tool. The baseline knowledge and education for RN’s and RPN’s might suggest that there would be a difference in the depth of a patient review leading to the suggestion for a parallel review to be conducted. External reviewers observed some variance but add that years of experience, familiarity with the unit, and how long the nurse had been caring for the patient also contributed to how well the nurse could offer details about the care.

It is important to note the distinction between existing workload measurement tools and the information that can be gathered using this toolkit. As pointed out in the comments about changing staffing models, the project leaders recommend conducting comparisons to understand the implications. Further suggestions for implementation will be reviewed in the recommendations section.

7.4 Staff Mix Decision Making Process:

Overall, nurse leaders indicated that the toolkit would be useful in making nursing staff mix decisions. However a number of challenges related to staff mix decision-making were reported. Some of those who indicated that they were not likely to integrate the information generated through the toolkit into staffing decisions identified concerns about nursing workload. These included both the lack of workload information captured with the toolkit and the importance of understanding the work required for RN/RPN models to be effective. A number of responses suggested that nursing leaders were concerned about the workload for RNs in providing consultation and support to RPN colleagues, and about perceived inequities in workload due to lack of awareness of this aspect of RN work. Unit leaders also identified a need for greater understanding among nurses of both RN and RPN scopes of practice. Some nurse leaders also suggested a preference for all-RN models with the addition of unregulated personnel, rather than an RN/RPN staff mix. It was unclear from the respondents whether this conclusion was based on the toolkit data or reflected entrenched beliefs and past experiences.

Other leaders expressed discomfort in making decisions based on only two days worth of information. This emphasizes the need for organizations that are implementing the toolkit to examine weekly and seasonal variations in patient and environmental characteristics to determine the number and timing of unit reviews and collection of environmental data.

Nursing leaders did not identify characteristics of the practice environment that were assessed with the UEP as key elements in staff mix decision-making. Furthermore, when reviewing the compiled data related to patient care needs and unit environment they focused almost exclusively on the patient data. However the supports and demands of the clinical environment have been identified as a critical factor in determining the appropriate category of nurse to provide care (CNO, 2008). Furthermore, there is a body of evidence that suggests that aspects of the care environment are critical
considerations in nursing staff mix decisions (O’Brien-Pallas, et al., 2004). The lack of integration of the unit environment data into decision processes could be due to limitations of the UEP tool; that is, the instrument may not have captured or presented the information in a way that is usable for nursing unit leaders. However, it may also be the case that unit leaders are unclear about how to integrate this information with that related to patient care needs and to synthesize these factors into staffing decisions.

8 Implications for Practice and Research

8.1 Implications for Practice:
In today’s economic environment across Canada, provincial governments are facing record deficits and health care funding reductions. Nursing resources are frequently viewed as being potential costs to reduce in times of budget constraints. As a result, pressure is placed on nursing administration and managers to consider various staff mix changes, including different RN/RPN ratios as well as the addition of unregulated workers.

Staff mix changes must be made with empirical evidence that aligns the knowledge and skills of different workers to patient complexity, predictability, stability, and risk for negative outcomes. Traditional workload measurement tools are based on time estimates to measure workload. Unfortunately, these tools are inadequate for measuring the stability, complexity, predictability, and risk for negative outcomes of patients. The PCNA and UEP tools and the consensus-based review process were developed to improve decision making in matching patient need to nursing human resources, focusing on the patient’s needs, the nurse caring for the patient, and the unit environment. The results of this study support the use of the tools and process to guide managers in deciding the appropriate staff mix on medical-surgical units.

The toolkit has implications for nursing practice in that it represents the operationalization of the key concepts of the College of Nurses of Ontario three-factor framework into a comprehensive set of tools and procedures that can be used by nurses to judge the care needs of individual patients along with the characteristics of the patient care unit. Involving staff nurses in the review of patient care needs along with the nursing leaders of the unit facilitates a shared understanding of the range of needs, how they relate to RN/RPN utilization and enhance the acceptance of potential changes in skill mix. Nursing administrators can potentially use the tool to support and build staff mixes that address the complexity, predictability, stability, and risk for negative outcomes of patients in a measured and logical fashion that can be used in budget and operational planning. Application of the tools and processes will assist nursing leaders who are contemplating staff mix changes as well as those who are re-evaluating their current staff mix, for example when there are changes in the patient population or environmental context.

Implementation of the toolkit to support nursing staff mix decisions will require that nurse leaders are supported in applying the CNO three-factor framework. Decision makers will require a clear understanding of elements related to each factor of the framework and how they inter-relate. For example, knowledge of current scope of practice for both RNs and RPNs; awareness of what is currently happening in the health care environment; labour relations considerations; workforce demographics; attrition; and regulatory changes can all impact the appropriateness of skill mix changes. Ultimately, it is essential that leaders have knowledge and ability to measure and monitor trends in patient, nurse, team, and system outcomes in order to evaluate and defend their decisions. One aspect of nursing work that is not captured through the toolkit is the amount of time and physical demands associated with meeting the needs of patients. Traditional workload measurement
processes are designed to assess the volume of work that patients’ needs generate, and to estimate the time required to meet those needs. In applying the results of the toolkit to staff mix decision-making, it is important that this aspect of nursing work be integrated into the decision.

Additional uses of the tools and processes may also be identified in the future. The CNO framework for the utilization of RNs and RPNs (2008) is intended for decision-making regarding identification of the appropriate category of nurse to care for individual patients. Therefore the PCNA might be adapted for, or integrated with procedures for guiding the daily assignment of nurses to patients. Since the CNO framework also emphasizes the knowledge, skill, and experience level of the individual nurse as well as the registration category, these factors would also need to be considered in matching individual nurses with patients. Similarly, the toolkit could be used to assist in determining appropriate staffing ratios; that is, the number and mix of patients assigned to each nurse, and the total nursing staff complement required on a unit.

Another potential use of the toolkit is in determining the supports that are required for optimal nursing practice and patient outcomes. For example, the toolkit could be applied as part of a comprehensive learning needs assessment for nursing staff. Because it facilitates the collection of data about the needs of the population of patients on a unit as well as the environmental supports available to the nursing staff, results of the application of the toolkit could be used to inform development of educational programs that would match the requisite knowledge and skills to meet the needs of unique patient populations. Understanding the needs of patients, characteristics of nurses, and supports and demands of the environment could also help to identify other enhancements such as the number and focus of nursing leadership roles or the addition of unregulated personnel.

8.2 Implications for Future Research:
Results of the current study provide support for the reliability and validity of the inferences drawn from the application of the PCNA to identify patients’ needs for nursing care. However additional research is required to understand the processes through which clinical nurses and nurse leaders can use this information to support effective decisions regarding nursing staff mix. For example, prior application of the unit review process included an additional step in which each patient was identified as appropriately assigned to either an RN or an RPN. Studies exploring this and other procedures for moving from data collection to staff mix decisions is required.

Furthermore, evaluation of the quality of staff mix decisions as determined by patient, nurse, and system outcomes is urgently needed. In particular the use of nurse sensitive outcomes data to measure the impact on patient outcomes is key. Studies that track these outcomes prior to and following staff mix changes, and comparisons of units with similar patient needs and unit environments but different staff mixes could be compared.

In this study, the PCNA tool was able to differentiate units with a higher percentage of patients that are not as stable, predictable, are more complex and have a higher risk of negative outcomes from units that had more stable, less, complex, lower risk patients. While it is logical to propose that the latter type of unit could support an RN/RPN staff mix, further study is required to determine the appropriate relationship among distribution and levels of these acuity dimensions, and nursing staff mix.

Finally, the results from analysis of the UEP tool indicate that more study is required related to the practice environment. Nurse leaders in this study did not recognize this information as relevant in informing nursing staff mix decisions. Further research is needed to illuminate the processes nurse leaders use in making staff mix decisions, and to support the effective integration of environmental factors into these decisions. In addition, aspects of the practice context beyond the patient care unit
may need to be considered for nursing staff mix planning. Exploration of the impact of factors such as organizational change, population health/demographics, emergence of new roles, and evolving technology on determination of the appropriate level of care provider should be considered.

Another important focus for future study is the influence of interprofessional collaboration on the effectiveness of various nursing staff mix models. Principles of interprofessionalism emphasize understanding the roles of team members, developing expertise in interprofessional collaboration, and practising to full scope (MOHLTC Interprofessional Care Steering Committee, 2007). Since nurses in acute care hospitals typically work within interprofessional teams there is a need to understand how aspects of interprofessional practice such as access to other professionals, organization of teams, and collaborative expertise can influence the effectiveness of patient care.

9 Limitations
The intent in the research was to capture data on decision making process through the Questionnaire for Unit Nursing Leaders, in hindsight we would have taped the debriefing meetings and done a qualitative analysis on them. The richness of the information that surfaced in the debriefing meetings, did not come through to the same extent in the questionnaire. It is also noted that the number of responses was small.

For the purposes of this research study, the data from the PCNA tool utilized Likert Scales and a consensus process for questions related to stability, predictability, complexity and risk for negative outcomes. While decision-making may appear logical for the patients who fall on the lower or higher scores on the scale, thoughtful interpretation of the results is required for the group of patients that fall in the middle range.

10 Conclusions
This study was the first to develop and test a toolkit to operationalize the College of Nurses of Ontario three-factor framework for utilization of RNs and RPNs. Results based on the utility of the patient care needs assessment tool applied through the consensus based review process support nursing staff mix decision making.

Future research is required to evaluate the quality of decisions resulting from application of the toolkit, and to illuminate the processes through which nursing leaders can best translate the information generated through the tools into staff mix decisions.

11 Dissemination
The research team are committed to sharing the tools and process that make up the toolkit. Discussions for publication with the Canadian Journal of Nursing Leadership are in progress. Continued involvement with the Nursing Secretariat to conduct further testing with the academic and community hospitals will expand the possibilities to enhance RN/RPN staff mix decision making and utilization across the province.
12 References


### 13 Appendix A – Patient Care Needs Assessment (PCNA) Tool

Date: YY/MM/DD  Patient #  Reviewer Initials:  

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>1.</strong> What issue(s) are important to this patient’s care that currently need(s) to be addressed?</td>
<td></td>
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<tr>
<td><strong>2.</strong> Vital Signs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Have the patient’s vital signs been within the following criteria over the last 24 hour period?</td>
<td></td>
<td></td>
<td>Comments:</td>
</tr>
<tr>
<td>- Respiratory Rate is between 8 and 30 breaths per minute.</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>- O₂ Saturations are greater than 90% on less than 50% O₂ or 6L/min.</td>
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<tr>
<td>- Systolic Blood Pressure is between 90 and 200 mmHg with no more than 40 mmHg decrease.</td>
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<tr>
<td>- Heart Rate is between 40 and 130 beats per minute.</td>
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</tr>
<tr>
<td>b. Are the patient’s vital signs within the expected range for this patient’s condition?</td>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
</tr>
<tr>
<td>c. How often does the patient need to have his/her vital signs checked?</td>
<td>Q2H</td>
<td>Q4H</td>
<td>Q6H</td>
</tr>
<tr>
<td><strong>3.</strong> Level of consciousness:</td>
<td></td>
<td></td>
<td>Comments:</td>
</tr>
<tr>
<td>a. Is the patient’s current level of consciousness within expected range for her/his condition?</td>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
</tr>
<tr>
<td>b. Is the patient currently experiencing fluctuations in level of consciousness?</td>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
</tr>
<tr>
<td><strong>4.</strong> Does the patient require increased monitoring for development of complications? (For example, you are worried about the health of this patient and are keeping a close eye on him/her)</td>
<td>Yes</td>
<td>No</td>
<td>Comments:</td>
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<tr>
<td>5.</td>
<td>Has the patient been experiencing acute confusion/agitation requiring ongoing assessment and treatment?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6.</td>
<td>Does the patient’s condition require increased assessment and adjustment in the plan of care? (For example, due to pain, fluctuating lab results, persistent fever, loss &amp; grief, fluctuating mood, blood glucose is not well controlled)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7.</td>
<td>Does the patient require interventions/treatments that will have an immediate systemic effect, which may create an urgent or emergent situation? (For example, new IV treatment, Heparin infusion therapy, chemo therapy, high alert drug treatment, first-time blood transfusion)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8.</td>
<td>In the last 48 hours, has the patient had an unexpected health event or crisis? (For example, severe or acute episode requiring immediate intervention such as a sudden drop in blood pressure, O2 saturation level, blood glucose, fall)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9.</td>
<td>Do the patient and/or family have complex support needs?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>10.</td>
<td>Are the patient and/or family facing complex decisions that require coordination/collaboration with multiple team members?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>11.</td>
<td>Overall, how stable is this patient?</td>
<td>Very Stable</td>
<td>Very Unstable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>12.</td>
<td>Overall, how complex is this patient?</td>
<td>Less Complex</td>
<td>Highly Complex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>13.</td>
<td>Overall, how predictable is this patient?</td>
<td>Highly Predictable</td>
<td>Less Predictable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
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</table>
14. Overall, how at risk is this patient for negative outcomes?

<table>
<thead>
<tr>
<th></th>
<th>Less Risk</th>
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<th>High Risk</th>
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<tbody>
<tr>
<td></td>
<td>1</td>
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<td>4</td>
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<td>6</td>
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</tbody>
</table>

## 14 Appendix B – Unit Environment Profile (UEP) Tool

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>DESCRIPTION</th>
<th>DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nursing Staff</strong></td>
<td>How many RNs (total FTE's) work on this unit?</td>
<td></td>
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<tr>
<td></td>
<td>How many RPNs (total FTE's) work on this unit?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Full-Time/Part-Time/Casual Nursing Staff (total number of individuals, not FTE's)</td>
<td></td>
</tr>
<tr>
<td><strong>Budgeted Skill Mix</strong></td>
<td>Number of Unregulated Patient Care Providers (total FTE's)</td>
<td></td>
</tr>
<tr>
<td><strong>Experience of Staff Nurses</strong></td>
<td>Number of Staff Nurses registered with College of Nurses Ontario for less than 3 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of RNs with less than 1 year experience working on the unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of RPNs with less than 1 year experience working on the unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of unit Staff Nurses 55 and over</td>
<td></td>
</tr>
<tr>
<td><strong>Educational Preparation of Nurses</strong></td>
<td>Number of Certificate RPNs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Diploma RNs/RPNs</td>
<td></td>
</tr>
<tr>
<td>Characteristics of Unit</td>
<td>Average Length of stay</td>
<td></td>
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<td>------------------------</td>
<td>------------------------</td>
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<table>
<thead>
<tr>
<th>Description of Support on Unit</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager</td>
<td></td>
<td></td>
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<tr>
<td>Other unit-based nursing leader support (e.g. Educator, APN)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Other nursing leader support on consultative basis</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Access to Rapid Response Team</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Access to other allied health support (Specify roles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-charge/Team leader without assignment (day shift)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Number of medical teams on the unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any clinical Associates, or Physician assistant role?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Category</td>
<td>Question</td>
<td>Yes</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Do you have nursing students on the unit?</td>
<td>If so, what times of the year and what year of nursing?</td>
<td></td>
</tr>
<tr>
<td>Other nursing roles on the unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupancy</td>
<td>Average occupancy year to date</td>
<td></td>
</tr>
<tr>
<td>Number of budgeted beds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse-patient ratio</td>
<td>Average # of patients per nurse on each shift 7 days a week</td>
<td></td>
</tr>
<tr>
<td>Policies, Procedures, and Guidelines</td>
<td>Access to policies and procedures relevant to practice area</td>
<td>Yes</td>
</tr>
<tr>
<td>Care pathways/protocols/plans of care specific to patient population(s) on unit (includes medical directives if appropriate)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Standardized assessment tools specific to patient population(s) on unit</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Policies/Protocols</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Guidelines</td>
<td>Policies/Protocols available for most situations/populations</td>
<td></td>
</tr>
<tr>
<td>Unanticipated events</td>
<td>Number of infectious disease outbreaks in past 3 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of Code Blue calls in past 3 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number of calls to Rapid Response Team in last 3 months</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total number of transfers to ICU in the last 12 months</td>
<td></td>
</tr>
<tr>
<td>Sick Time</td>
<td>Average sick rate (sick hours as percentage of productive</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Overtime</strong></td>
<td>Average OT hours as percentage of productive hours</td>
<td></td>
</tr>
<tr>
<td><strong>Agency Use</strong></td>
<td>Average Agency hours as percentage of productive hours</td>
<td></td>
</tr>
<tr>
<td><strong>Staff Turnover</strong></td>
<td>Percentage of unit staff nurse turnover over the past year (internal and external)</td>
<td></td>
</tr>
<tr>
<td><strong>Admissions</strong></td>
<td>Average number of admissions and transfers in (per day, evening, night)</td>
<td></td>
</tr>
<tr>
<td><strong>Composition of Patients</strong></td>
<td>How many different CMGs are cared for on this unit?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 to 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 to 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Greater than 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Please Explain:</td>
<td></td>
</tr>
<tr>
<td><strong>Other Unit Factors</strong></td>
<td>Are there other events that are not specifically related to the complexity of an individual patient, that would impact unit environmental complexity?</td>
<td></td>
</tr>
</tbody>
</table>

Drawn upon work of Linda O’Brien-Pallas (University of Toronto) on environmental complexity.
15 Appendix C – Patient Care Needs Assessment Opinion Questionnaire (PCNAOQ)

You are being invited to independently complete the following questionnaire. Your participation is completely voluntary, and your consent to participate will be implied by your completed questionnaire. The purpose of this questionnaire is to measure the face validity and feasibility of the PCNA Tool. If you choose to participate, please complete this questionnaire only once by circling the appropriate number aligned with each question.

1. Does this instrument comprehensively capture whether the patient has complex care needs?
   - Not at all 1
   - Somewhat 2
   - Very Much So 3

2. Does this instrument capture whether the patient is predictable in terms of their care needs?
   - Not at all 1
   - Somewhat 2
   - Very Much So 3

3. Does this instrument capture whether the patient is at risk for negative outcomes related to their care?
   - Not at all 1
   - Somewhat 2
   - Very Much So 3

4. Is the instrument clear and understandable?
   - Not at all 1
   - Somewhat 2
   - Very Much So 3

5. Is there any item missing from the instrument?
   - Not at all 1
   - Somewhat 2
   - Very Much So 3

6. Is the instrument easy to use?
   - Not at all 1
   - Somewhat 2
   - Very Much So 3

7. Is the instrument practical?
   - Not at all 1
   - Somewhat 2
   - Very Much So 3

Do you have any additional comments regarding the Patient Care Needs Assessment Tool?

_________________________________________________________________________________

__________________________________

_______________________________________________

Thank you for your time! Please place this questionnaire, completed or not, in the envelope provided, seal it, and place it in the designated study collection box on your unit.
16 Appendix D – Guidelines for Leaders for Unit Review Process

Based on the pilots we have compiled the following suggestions to guide you in working with the unit staff. Prior to the data collection please review the following guidelines and discuss relevant aspects with the nursing leaders from each unit in order to facilitate a comfortable environment for the staff nurses and minimize any feelings of discomfort.

- Arrange seating to minimize segregation of the staff nurse – helpful if the leaders sit on either side
- Pose questions to the unit staff as a group
- The staff nurse may find it helpful to have the chart
- Put away distractions such as blackberries and minimize the use of pagers
- Do not engage in side conversations or note writing in front of unit staff
- Provide a copy of the definitions and the PCNA tool for unit staff to refer to
- Throughout the review reinforce the consensus approach. Allow time for discussion and encourage input from all participants
- Include all staff working that day – agency and relief staff may require more input from the nursing leaders
- Where possible include the TL/charge nurse who will know about patient/family history/issues
17 Appendix E – Unit Environment Profile Opinion Questionnaire (UEPOQ)

You are being invited to independently complete the following questionnaire. The purpose of this questionnaire is to measure the face validity and feasibility of the UEP Tool. Your participation is completely voluntary and your consent to participate will be implied by your completed questionnaire. If you choose to participate, please complete this questionnaire only once by circling the appropriate number aligned with each question.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Not at all</th>
<th>Somewhat</th>
<th>Very Much So</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Does this tool comprehensively capture the dynamics of your clinical unit?</td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Does this tool capture whether the unit is predictable?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Does this tool capture whether your unit is stable?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Is there any item missing from the tool?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Is the tool easy to use?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Is the tool practical?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Do you have any additional comments regarding the Unit Environmental Profile Tool?

_________________________________________________________________________________
_________________________________________________________________________________

Thank you for your time! Please place this questionnaire, completed or not, in the envelope provided, seal it, and place it in the designated study collection box on your unit.
18 Appendix F – Questionnaire for Unit Nursing Leaders

You are being invited to independently complete the following questionnaire. Your participation is completely voluntary and your consent to participate will be implied by your completed questionnaire. The purpose of this questionnaire is to assess the utility of the review process in informing decision-making regarding staff mix. If you choose to participate, please complete this questionnaire by answering the following questions:

1) Based on the data you have received from the 2-day review process using the PNCA tool, and completion of the UEP tool, has this experience helped shaped your decision-making in regard to nursing staff-mix human resources planning, and why/why not?

______________________________________________________________________________
______________________________________________________________________________

2) Would you make staffing changes based on this review, and if so why/why not? And, what would those staffing changes be?

______________________________________________________________________________
______________________________________________________________________________

3) Are there one or two key elements that you believe will particularly help your staff-mix decision-making, and if so, what are they?

______________________________________________________________________________
______________________________________________________________________________

4) Is there anything missing from this process that you believe you would still need to consider before making any staffing decisions?

______________________________________________________________________________
______________________________________________________________________________

5) Are there any comments/feedback you would like to give in regard to this entire process, including the tools and their impact on your staff-mix decision-making, and if so, what are they?

______________________________________________________________________________
______________________________________________________________________________

Thank you for your time! Please place this questionnaire, completed or not, in the envelope provided, seal it, and place it in the designated study collection box on your unit.
19 Appendix G – Patient Requirements for Nursing (PRNC) Tool

A. INSTABILITY

1. Monitoring vital signs (e.g. heart rate, temp, bp, pulse, respirations, neuro signs, CVP etc) is required.
   1. less than q4h
   2. q4h
   3. more than q4h
2. Degree of alertness, ability to respond.
   1. alert, responds appropriately
   2. rouses but is drowsy/lethargic
   3. unconscious/semi-comatose
3. Requires assessment due to risk for failure or actual failure of:
   1. one body system
   2. 2 body systems
   3. more than 2 body systems
4. Requires care for: multiple or complex dressings (e.g. burns, draining fistulas, packs etc.); multiple tubes that require care (e.g. chest, N/G, trach, foley/suprapubic); dialysis; other invasive lines or equipment.
   1. no complex treatments or stable and established
   2. one of the above (e.g. complex dressings or invasive lines) or changes required in established treatment
   3. any combination of the above
5. Requires administration of multiple medications and assessment of effects.
   1. less than 3 oral medications
   2. 3 or more medications or medications by parenteral route
   3. multiple medication by multiple routes
6. Requires assessment/monitoring due to disorientation, inability to comprehend spoken word, inappropriate behavior mental disturbance of rapid onset.
   1. oriented, comprehends and is appropriate
   2. concern in one of; orientation, comprehension or behavior
   3. concern with 2 or more of the above or suicidal

B. CLINICAL JUDGMENT

7. Analysis of condition/symptoms (physical or mental) is required
   1. minimal assessment/analysis; stable
   2. monitoring required for potential instability in any of the above
3. detailed assessment & analysis required due to fluctuation in patient status

8. Problem solving, decision making and alterations of care are required and are based on assessment & analysis
   1. no changes/actions
   2. single action/alteration in care required
   3. frequent actions/alterations in care required

9. Requires complex discharge planning
   1. no resources required or information sheet only
   2. coordination of one resource
   3. planning requires coordination of multiple resources.

C. EDUCATIONAL NEEDS

10. Educational needs include; provision of varying degrees of information, development of understanding, skill acquisition for patients/families.
    1. information only
    2. skill acquisition
    3. comprehensive understanding with/without skill acquisition.

11. Requires counseling re: alteration in lifestyle or lifestyle changes.
    1. no
    2. minimal counseling for minor lifestyle changes (e.g. diet modifications)
    3. extensive counseling re: lifestyle changes (e.g. diabetes, chemical dependency).

D. EMOTIONAL SUPPORT NEEDS OF PATIENT/FAMILY

12. Requires support to identify or facilitate patients/families coping strategies and decision making for change.
    1. no
    2. minimal counseling
    3. extensive or multiple changes/decisions required

13. Conference with patient/family
    1. none
    2. routine; with patient only
    3. ongoing, complex conferences required with multiple individuals.

E. PHYSICAL CARE NEEDS

14. Mobility; patient ambulates/transfers
    1. independent
    2. needs assistance/guidance
    3. complete assistance for all mobility
15. Activities of daily living (dressing, bathing, grooming, nutrition)

1. can do independently with or without “set up”
2. needs some direction/assistance to complete ADL
3. total assistance.

**Total Score = _____**  **Mean Overall PRNC score = _____**

**Individual Item Scoring**

<table>
<thead>
<tr>
<th>Individual Item Score (1-3)</th>
<th>Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Patients who are stable, have predictable outcomes and require less complex care.</td>
</tr>
<tr>
<td>2</td>
<td>Patients who are less stable, have less predictable outcomes and require more complex care.</td>
</tr>
<tr>
<td>3</td>
<td>Patients who are unstable, have unpredictable outcomes and require very complex care.</td>
</tr>
</tbody>
</table>

**Note:** “Increasing scores indicated increasing complexity of care requirements. Patients with a mean overall PRNC score of 1.5 or less (range = 1-3) were considered to be relatively stable with predictable outcomes. Those patients with mean overall PRNC scores above 1.5 were considered to be increasingly complex with less predictable outcomes.”

20 Appendix H – Open Ended Questions for Focus Group Sessions

Focus groups will be conducted during the main study with a sample of review team members to gain an understanding of the characteristics and the experience of a review process that includes the use of the PCNA tool and the UEP tool. These questions will guide those focus groups.

1) What was it like for you to participate in the patient care needs assessment review? What did you like or not like about the review?

2) Did the process enable an accurate assessment of your patient’s care needs?

3) Were there aspects of your patient’s care needs that were not addressed?

4) How did the process help or hinder your involvement?

5) Please tell me about your experiences using the PCNA and if you used it, the UEP?

6) Were there barriers that you encountered in completing this review process and if so, what were they?

7) Are there components that you would change (either add or delete) from this review process, and if so, what are they?

8) Would you recommend this review process, and why/why not?

9) Is this a process that is comprehensive, easy to replicate and ‘user-friendly’?
## 21 Appendix I – Definitions of Stability, Complexity, Predictability,

| Stability refers to how quickly and how much or how little the patient’s condition/care needs are changing. | Stability is high when patient changes are minimal and occur over a longer period of time. Stability decreases when changes are substantial and/or are occurring rapidly. |
| Complexity is concerned with the amount and diversity of factors that are affecting the patient’s condition. | Complexity of care increases when patients’ care needs are fluctuating or are not well-established, when multiple health problems are present, or when interventions may affect multiple systems or conditions. |
| Predictability refers to how well we can anticipate what is going to happen with the patient. | Predictability is high when patient care needs and responses are expected, and plans for care can be developed in advance. Predictability decreases when patient care needs are unknown, and a plan of care cannot be determined in advance. |

Definitions drawn from:

Welcome staff nurse and thank them for their participation. Introduce everyone at the table.

Briefly go over the background and purpose of the study. Reinforce that the purpose of the data collection on the review day is to test the tool.

Outline the process of reviewing each patient using the PCNA tool

- Go over the consensus approach
- Define the role of all the members of the unit team at the table
- Explain that the unit review will be repeated in a week or so

Reinforce the importance of patient confidentiality and that the external researchers should not know the name of the patient.

Confirm that the staff nurse understands the study and ask if she/he has any questions.

Tell the staff nurse about the evaluation after the review in which they are the research participants.

- This includes the questionnaire which is voluntary and invite them to complete it if they would like to. (implied consent)
- Tell them there will be an invitation to participate in a focus group in which participants will have an opportunity to talk about the process. They will be asked to complete a consent form if they choose to participate.

Before starting with the first patient tell the nurse that one researcher will record the answers. Offer to read out each question for the first patient.

Check if the nurse has any questions after finishing the first patient. Before carrying on give them the option to either follow the tool themselves or continue reading out each element.

After completing the review thank the nurse. Advise each staff member to approach any one of the leaders at the table if they have any questions, concerns or suggestions about the tool or the process and to alert the unit leader if there are any rumors or concerns they feel should be addressed.

Remind the nurse to take the opinion questionnaire and where to place it confidentially on completion. Also remind the unit leaders to complete one at the end of the review.
## 23 Appendix K – End of Day Review Summary Sheet

At the end of each review day, the designated lead of the external review team will answer the following questions with input from the internal review team as needed.

<table>
<thead>
<tr>
<th>Item</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is today’s date?</td>
<td></td>
</tr>
<tr>
<td>2. Was this a Day #1 or Day #2 review?</td>
<td></td>
</tr>
<tr>
<td>3. What is your organization and unit code?</td>
<td></td>
</tr>
<tr>
<td>4. Was the review day ‘typical’ or not? (YES/NO) And if ‘no’, why not?</td>
<td></td>
</tr>
<tr>
<td>5. How many PCNA Tool Opinion Questionnaires were distributed today (including to internal or external review team members as appropriate)?</td>
<td></td>
</tr>
<tr>
<td>6. Indicate which tool was used first (PCNA or PRNC) if conducting convergent validity testing that day. (Note: for convergent validity testing, if randomly selected to start with the PRNC tool, then the next two assessments would start with the PCNA and then the PRNC tool respectively.)</td>
<td></td>
</tr>
<tr>
<td>7. Please list the position categories for each individual who made up the review team (both internal and external review team members) today. (Note: “clinical” nurses involved with the review, need only be listed once as a collective group.)</td>
<td>1. 2. 3. 4. 5. 6.</td>
</tr>
</tbody>
</table>
| 8. Please list the approximate time it took on average for each review, and the total time it took from start to finish to complete the reviews, noting the number of patients reviewed. | ___minutes on average/review  
___hrs:___minutes in total for all reviews  
___total number of reviews completed |
24 Appendix L – Letter Seeking Focus Group Participation

DATE

Dear colleague;

This letter is in regard to the testing we are completing on the Patient Care Needs Assessment (PCNA) tool and associated review process as part of the Ministry of Health and Long-Term Care funded demonstration site project entitled, “RN/RPN Utilization Tool-Kit”. If you did not participate in this review process you may disregard this invitation as this letter is being sent to all staff on units where reviews occurred.

The investigative team would like to invite you to voluntarily participate in a focus group session being held on ________ at ______hrs in the __________. Written consent to participate will be obtained at the beginning of the focus group, and all information will be confidential and you will not in any way be identified personally in the study results.

The intent of this focus group is to gain an understanding of the characteristics and the experience of the review process you previously participated in involving the use of the PCNA tool, and for those who may have used the Unit Environment Profile (UEP) tool. We anticipate that the session would be approximately 90 minutes in length, and will be guided by a facilitator who will ask open-ended questions to generate discussion which will be audio taped and documented by a scribe.

Your perceptions of and reactions to the new instruments and review process would be very helpful to hear, and would enhance our data to make it as rich and rigorous as it can be. Thank you for considering this request, and if you are able to attend, please simply arrive at the location on the date and time listed above. Thank you.

Warm regards,

NAME of Investigator and Site Coordinator

Phone#

Email
### Appendix M – Number of Unit Reviews by Site

<table>
<thead>
<tr>
<th>Site</th>
<th>Number of Site Units Participated in Project</th>
<th>Number of PCNA Reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunnybrook Health Sciences Centre</td>
<td>13</td>
<td>753</td>
</tr>
<tr>
<td>Hamilton Health Sciences</td>
<td>3</td>
<td>177</td>
</tr>
<tr>
<td>Kingston General Hospital</td>
<td>3</td>
<td>212</td>
</tr>
<tr>
<td>North York General Hospital</td>
<td>3</td>
<td>181</td>
</tr>
<tr>
<td>St. Michael’s Hospital</td>
<td>6</td>
<td>286</td>
</tr>
<tr>
<td>The Scarborough Hospital</td>
<td>4</td>
<td>230</td>
</tr>
<tr>
<td>University Health Network</td>
<td>4</td>
<td>230</td>
</tr>
<tr>
<td><strong>Total Units</strong></td>
<td>36</td>
<td><strong>Total Number PCNA Reviews</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>2069</strong></td>
</tr>
</tbody>
</table>