Exploring Clinical Reasoning and Judgement Processes among New Graduate Nurses

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Legend

NGNs – New Graduate Nurses

CR—Clinical Reasoning

MMR—Mixed Methods Research

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Abstract

Introduction: The notion of a seamless transition from the academic to the clinical practice environment for newly graduated nurses (NGNs) remains an ideal. Practice challenges stemming from an under-developed cognitive reasoning ability is associated with new graduate nurses entering the workplace. To date, this remains a concern for practice safety and readiness for the professional nurse role. Given an increasingly complex and fast-paced work environment that is characterized by high acuity levels, in-depth insights to the various aspects and processes that influence the development of clinical reasoning of nurses during transition remains an under-researched area. An understanding of factors that shape NGNs' ability to recognize and reason through clinical scenarios effectively is vital in order to leverage workplace transition and inform learning programs that support transition in the workplace. This doctoral research examined newly graduated nurses' clinical reasoning processes and decision-making abilities to provide guidance in the creation of comprehensive transition programs and explore the influences of contextual factors on clinical reasoning in order to support NGNs entering the workforce.

Methods: Mixed methods methodology was utilized to answer the research question and consisted of data collection with the NGNs' at 3-4 months and at 11-12 months of practice experience in their first year.

Results: Four main themes were identified; findings suggest several factors influence clinical reasoning and decision-making ability in the new grad ability as they go through different aspects of transition shock in the first year of practice.

Conclusion: NGNs' clinical reasoning and judgment ability require time for their development with emphasis not only on content accuracy but also inclusive of process accuracy in reasoning.

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Chapter One: Introduction

The notion of a seamless transition from the academic to the clinical practice environment for newly graduated nurses (NGNs) remains an ideal. This is exemplified by the vast published work which describes the challenges newly graduated nurses face during their transition into the workplace starting with Kramer's pioneering work on reality shock (Kramer, 1974). Since then, nurses' learning experiences and challenges faced during transition, as well as benefits to effectively support them during this time have been extensively documented nationally and internationally (Boyer et al., 2018; Bridges, 1980; Duchscher, 2009; Goode et al., 2016; Kramer, 1974). Nurses transitioning into the workforce may not perceive themselves as capable of performing their required duties largely due to a disconnect of what they see as an ideal patient scenario and the reality of hands-on nursing (Duchscher, 2009). For example, Kavanaugh & Szweda's (2017) qualitative study involving pre and post-performance based surveys administered to a minimum of 5000 newly graduated nurses over a period of five years suggested that newly graduated nurses had enough information and nursing knowledge upon graduation to successfully pass the standardized provincial or state board license exams but were unable to demonstrate adequate problem resolution abilities resulting in potentially unsafe practice and decision-making implications. Similarly, findings from a mixed methods research study by Monagle et al. (2018) suggested a need for developing clinical reasoning abilities among new graduates entering the workplace. Participants were randomly assigned into either an experimental or control group using an online computerized program. A self-assessment of their clinical judgment from structured reflection sessions were conducted at 5 to 7 months and at 10 to 12 months of practice experience. Participants experienced difficulties knowing what to do next in prescribed clinical scenarios, an example of one participant's experience was "I was

skillful in knowing that another intervention was needed; however, I didn't know what specifically to ask for" (Monagle et al., 2018, p. 204). Existing research focuses on a disconnect with NGNs' performance abilities and clinical practice realities surrounding patient care, a negative perception about their ability to execute their role as nurses upon entering the workplace (Kavanagh & Szweda, 2017; Mirza et al., 2019). To date, the practice challenges stemming from an under-developed cognitive reasoning ability associated with new graduate nurses remains a concern for practice safety and readiness for the professional nurse role (Kavanaugh & Szweda, 2017; Matlhaba & Khunou, 2022; Monagle et al., 2018; Murray, Sundin & Cope, 2017; Parker et al., 2014; Theisen & Sandau, 2013). Specifically, in-depth insights into the various aspects and processes that influence the development of clinical reasoning of nurses during transition is needed. Given an increasingly complex and fast paced work environment that is characterized by high patient acuity levels, a comprehensive understanding of nurses' experiences in transition remains an under-researched area. A complete understanding of factors that shape new graduate nurses' ability to recognize and reason through clinical scenarios effectively is vital in order to effectively leverage workplace transition and inform learning programs that support transition in the workplace. This doctoral research will add to the current body of knowledge on nurses in transition by examining newly graduated nurses' clinical reasoning processes which will provide important guidance in the creation of comprehensive transition programs and has potential implications related to quality and safety for health care organizations and for patients.

The typology of published work on new graduate nurses' experiences during transition depicts NGNs undergoing challenges with practice performance and with the management of clinical scenarios in their roles as nurses. Other works speak to the experiences of nurses in the role of a mentor or preceptor who support NGNs during transition and educational interventions

and/or transition programs implemented to support NGNs during transition. There is also literature that focuses on clinical reasoning (CR) and decision-making processes in the workplace of NGNs and nurses in general. A description of these factors will be presented next to provide a contextual and theoretical basis to situate this research study.

Background: New Graduate Nurses Practice Performance During Transition

It is well documented that NGNs entering the professional nurse role face performance challenges that characterizes their role as novice nurses (Benner, 1982; Benner & Wrubel, 1982). Benner's stages of skill acquisition, adapted from Dreyfus & Dreyfus Model of Skill acquisition, provides a description of nurses' skill performance as they gain experience as nurses within the workplace. Novice nurses rely on objective measures and rules; they have theoretical knowledge but lack experiential knowledge and experience about clinical notions (Benner, 1982). Within the novice nurse category, Benner (1982) suggests new graduates lack experience with a range of clinical scenarios with varying patient complexity and acuity levels, that afford them the opportunity to apply the level of clinical reasoning necessary to make sound judgements and decisions about patient care. As such, they rely on rules for assessments and require assistance to determine the appropriate response each time they are faced with a different scenario. Consequently, new graduates require guidance to recognize complex patient conditions and to develop clinical judgments addressing specific scenarios, and this impacts their practice performance in the workplace. Benner & Wrubel (1982) defined clinical knowledge as "knowledge embedded in the practice of nursing" (Benner & Wrubel, 1982, p. 11). Meaning new graduates will gain the necessary clinical knowledge and experience about management of an illness condition when they are exposed to that condition in the workplace. For example, knowledge about the effective management of a cardiac infarction crisis and the accompanying

diagnostic test, blood draw and treatment teams involved, requires that a new graduate nurse is exposed to such a scenario to develop their clinical knowledge, reasoning, and experience in managing future scenarios effectively. Long standing nurses, with experience of many clinical encounters typically operate at competent, proficient, or expert levels, and have a perceptual grasp of a range of diverse clinical occurrences that the novice graduates have yet to develop (Benner, 1982). This influences the NGNs' clinical judgment (CJ) abilities about patient care and safety. NGNs need to be supported to develop clinical knowledge and reasoning ability and "it is best to acknowledge and plan for this acquisition of clinical judgment in training the clinician and in advancing clinical knowledge" (Benner & Wrubel, 1982, p. 12). Failure to fully understand NGNs clinical reasoning capability upon entering the workplace can potentially compromise patient safety in that onboarding programs and recruiting units are unable to create learning environments that enhance practice performance given the dynamic context of clinical practice. NGNs are just beginning to create the cognitive constructs required to recognize and respond to changing patient conditions. It is important for leaders to help novices create a scaffolding process of clinical decision-making and to assign NGNs appropriate workload within clinical context. Hence the need to understand new graduate nurses' clinical reasoning upon entering workplaces is important to facilitate learning and enhance their practice performance as they start to create mental constructs about different clinical scenarios.

Duchscher's (2008, 2009) theory of professional role transition for the NGN describes spheres of transition the NGNs encounter as they adapt to the professional nurse role in the workplace and emphasizes the ways each sphere influences their practice performance. Duchscher suggests new graduate nurses undergo transition shock physically, emotionally, socio-developmentally, and intellectually. The intensity of transition shock experienced by the

new graduate nurse is influenced by their roles, responsibilities, relationships and knowledge application opportunities within their places of work (Duchscher, 2009, 2012). New graduates in transition may not perceive themselves as capable of performing their required duties largely due to a disconnect between what they see as an ideal patient scenario and the reality of hands-on nursing (Duchscher, 2009). The complexity of different patient conditions, familiarity with treatments and management of illnesses, and stability of work environments will determine the graduate nurse's progression in their role as nurses, as well as the intensity of their shock experiences (Duchscher, 2008). The transition shock theory illustrates the vital influence of context on the development of nurses' skill and clinical knowledge of their professional nurse role. Practice performances of new graduate nurses will be best facilitated by a stable, consistent, predictable and familiar work environment (Duchscher, 2012) that affords them the opportunity to evolve their clinical reasoning. This requires manageable nursing responsibilities and intentional but gradual exposure to a range of clinical scenarios with an appropriately evolving level of complexity that allows opportunities for NGNs to develop their clinical knowledge safely. Despite what we know about factors that influence the intensity of transition and transition shock, little is known about the extent to which they affect new graduates' clinical reasoning processes and clinical judgment, or how the aforementioned factors influence the NGNs' development of perceptual and clinical knowledge. Finding a consistent definition of NGNs across the literature is challenging. Sandler (2018) defines NGNs as nurses who have recently graduated from an accredited school of nursing in the last two years and are licensed. For the purpose of this research, NGNs are referred to as graduated and licensed nurses with practice experience of up to twelve months.

Published work that examines new graduate nurses' transition into the professional nurse role suggests that they continue to encounter practice challenges upon entering the workforce (Bakon et al., 2018; Doughty et al., 2018; Duchscher & Corneau, 2023; Labraue & McEnroe-Petitte, 2017; Missen et al., 2015; Powers & Herron, 2019; Russell & Juliff, 2021). For instance, Labraue & McEnroe-Petitte's (2017) integrative review of original studies that examined new graduate's experiences in the workplace suggest the transition period was a stressful one for these nurses due to work complexities, an increased workload, and the responsibility of handling, monitoring and mixing of high-risk intravenous mixtures that have implications on the quality and safety of care they provide. Other areas of stressful experience include the nature of the work environment and collaboration with other health care workers. Labraue and McEnroe-Petitte (2017) concluded that "overall, nurses having less than 2 years of work experience reported the highest stress levels compared to those nurses having more than two years of experience, specifically in the area of nursing skills" (Labraue & McEnroe-Petitte, 2017, p. 500). Additionally, the perception about new graduates' knowledge and ability to provide care has been questioned by nurse colleagues. Doughty et al.'s (2018) qualitative study examined the experiences of newly graduated nurses using semi-structured interviews and focus groups and found that new graduates were perceived negatively by their more experienced colleagues. Specifically, they were perceived as weak, as one NGN participant reported the following interaction with a more experienced nurse "oh you are a new grad, I'll take over this…, go check on your other patients, …You feel a bit useless and don't feel valued; it's all a bit degrading" (Doughty et al., 2018, p. 103). These experiences intimate a need to understand the various aspects that characterize new graduate nurses' clinical reasoning and decision-making ability to promote the development of effective clinical judgment and clinical skill expectations as they

enter the workplace. One means of facilitating the development of clinical knowledge among new graduates is through providing transition to practice programs within the workplace.

Transition Programs

Transition-to-practice programs (TPP) are one means of supporting NGNs as they move into the workplace (Health Force Ontario, 2017). A range of terminology is used to refer to programs that support NGNs' transition into practice including internship, residency, new graduate guarantee initiative, transition to practice, entry-to-practice, and early career programs (Doughty et al., 2018; Health Force Ontario, 2017; Rush et al., 2019; 2013; Tyndall & Firnhaber, 2018). Despite the variation in titles, programs to support transitioning nurses are consistently argued to be essential to foster NGNs' knowledge and competence development and to afford new practitioners time to adapt to their workplace, increase their confidence and competence levels, which will in turn enhance patient safety (Health Force Ontario, 2017). Yet, articles that explore descriptive features of new graduate's clinical reasoning and its development are limited.

Despite the acknowledged role of transition programs in supporting NGN hires, there is a lack of consistency in how such programs are implemented in practice settings which can be reasonably assumed to variably influence the development of clinical reasoning and knowledge among new graduates (Anker et al., 2019). There are marked differences with respect to the format of transition programs, particularly the structure, content, and length of these programs (Tyndall & Firnhaber, 2018). Some are formally structured programs with contractual enrollment agreements between the nurse graduate and the employer (Anker et al., 2019; Tyndall & Firnhaber, 2018), while others are less structured and employer-determined with no formal enrollment agreements (Powers et al., 2019). These different approaches result in variations in

the structure, content and length of these programs that are likely to influence the teaching and learning expectations and experiences of nurses involved. For example, informal transition program models are characterized by increased flexibility from multiple stakeholder involvement; nurse administrators are influential in the structure and content of the informal programs with the intent to meet the specific needs of their respective units (Missen et al., 2015), operational budget and planning, and their desire to promote positive work attitudes (Africa, 2017; Bakon et al., 2018; Chant & Westendorf, 2019; D'Addona et al., 2015; Daws, McBrearty & Bell, 2020; Rush et al., 2013; Strauss, 2016). Africa's (2017) discussion paper calls for unit managers to be involved with the planning and review of the staffing needs of the workplace prior to the implementation of TPP programs thereby ensuring TPPs are tailored to building needed skills and competencies. Further to this, Bakon and colleagues' (2018) reported variations in manager involvement and influence on the length of transition support programs in an attempt to meet the needs of their respective work environment. These same managers were responsible for ensuring the new graduate nurses met the required competency criteria set by the units, most of which referred to technical skills. From the transition program literature, emphasis seems to be placed on new graduates meeting the performance needs of the units. How new graduate nurses are supported with the management of clinical problems and their engagement of clinical reasoning remains speculative.

Transition to practice programs have been identified as having the potential to contribute to the development of clinical reasoning within the context of clinical practice education through the use of the preceptors or mentors as a designated resource person paired with the NGN to support workplace learning (Bakon et al., 2018; Missen et al., 2015; Powers & Herron, 2019; Rush et al., 2019; Strauss et al., 2016). Strauss et al. (2016) examined the effectiveness of TTP

programs from the graduate nurse's perspective using a cross-sectional survey design. Findings illustrated that programs that "helped (NGNs) adapt to the new department included a professional preceptor who is accessible and available whenever needed" (Strauss et al., 2016, pp. 434). Similarly, Bakon et al.'s (2018) integrative review described the preceptor/mentor role as one that offers guidance and support to new graduates in a new work environment. Designated support people were identified as preceptors, mentors, coaches as well as nursing peers were credited as a source of informal support (Rush et al., 2014). All of the aforementioned support people were reportedly correlated with preceptee/mentee education, knowledge, and competence development in clinical practice settings. Despite the value of preceptors and mentors in the support of new graduate nurses in clinical practice settings, little is known about how they contribute to the development of clinical reasoning and how they assist new graduates to think through complex clinical scenarios. This understanding is important since preceptors and mentors act as a gatekeeper of knowledge application and, in part, ensure that the new graduates' practices and clinical skills meet the professional practice standards of the workplace units (Adams & Gillman, 2016; Rush et al., 2019).

The utilization of the preceptor and mentor roles within TPP programs in the context of clinical work is to provide practice support, supervision, apprenticeship, assistance with competence and knowledge building within a teaching-learning relationship. This large scope of practice makes it difficult to isolate the unique contribution of each role in the development of clinical reasoning and judgment (Kramer, 1974; Ward & McComb, 2018; Whitehead et al., 2013). For instance, the preceptor role is used to provide apprenticeship knowledge, practice support, and competency evaluation (Ankers et al., 2018; Chant & Westendorf, 2019; D'Addona et al., 2015; Rush et al., 2014), professional socialization into the unit and with staff (Adams &

Gillman, 2016; Anderson et al., 2012; Brook et al., 2019; Rush et al., 2019; Williams et al., 2018), and act as a means to give feedback (Kaihlnanen et al., 2019). Similarly, the mentor role is utilized in transition programs to provide practice support, supervision, apprenticeship, assistance with competence and knowledge building in a teaching-learning relationship based on a relationship (Billings & Kowalski, 2019; Ward & McComb, 2018; Zhang et al., 2016). Similarities in clinical tasks involved with both roles and the patient care contexts within which both roles are enacted contribute to role ambiguity. The apprenticeship style of teaching in clinical practice settings is likely to result in a show-and-tell style of clinical teaching (Ankers et al., 2018; Chant & Westendorf, 2019) which does not necessarily make explicit, nor adequately grow the cognitive capacity required in problem resolution and management of clinical scenarios.

Clinical reasoning is a skill that can be taught and developed over time (Benner et al., 2010; Jessee, 2018; Powers & Herron, 2019; Tanner, 2006). While good clinical reasoning abilities are exemplified when patient outcomes are improved, poor clinical reasoning "results in adverse events" (Jessee, 2018, p. 8). In many transition programs, a designated resource person identified synonymously as a preceptor, mentor or coach is paired with the learner to support learning (Bakon et al., 2018; Rush et al., 2019; Strauss et al., 2016). Several ambiguities in roles have been identified regarding the preceptor role (Bakon, et al., 2018; McSharry & Lathlean, 2017). For instance, preceptors view their role as primarily clinicians (Trede et al., 2016) and lack pedagogic competencies to facilitate and evaluate learning, with many describing themselves as "clinician experts and not expert teachers" (Powers & Herron, 2019, p. 135). Although preceptors and mentors do play a crucial role contributing to the development of clinical reasoning, evidence suggests preceptors are themselves ill-equipped to teach clinical

reasoning skills as well as lack theoretical guidance about their own practice (Omansky, 2010; Whitehead et al., 2013; Chan et al., 2019). Therefore, exploring how new graduate nurses make clinical decisions shortly after their transition into the workplace is likely to provide information about their clinical reasoning patterns, their reasoning attributes and how best to support the development of this vital skill.

Nurses Clinical Reasoning and Judgment. Clinical judgment (CJ), clinical reasoning (CR) and clinical decision-making (CDM) are all terms used interchangeably even though their meanings differ (Lasater et al., 2019; Holder, 2018). Tanner (2006) defined clinical judgment as an "interpretation or conclusion about a patient's needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient's response" (p. 204). She also offered a definition of clinical reasoning as "the processes by which nurses and other clinicians make their judgments, and includes both the deliberate process of generating alternatives, weighing them against the evidence and choosing the most appropriate action" (Tanner, 2006, p. 205). Lasater and colleagues (2019) defined clinical reasoning as "the process used for developing the judgments" (Lasater et al., 2019, p. 37). Finally, clinical decision-making refers to an outcome or resulting action from the reasoning process (Simmons, 2010). From these definitions, I conclude that clinical judgment and clinical reasoning involve cognitive and intuitive processes leading to a decision to act in one way or another.

A distinctive attribute of the role of professional nurses is the ability to make sound clinical decisions. Effective clinical judgment and decision-making are supported by the Canadian Nurses Association (CNA) as important aspects of quality patient care (CNA, 2010). The consequences of an inability to apply good clinical judgment in patient care has the

potential to compromise patient safety and the overall quality of service (Murray et al., 2017; Purling & King, 2012; Saintsing, et al., 2011). For instance, Purling and King (2012) provided an integrative review of graduate nurses' ability to recognize and respond to deteriorating patient status in the clinical area. Their findings suggest effective reasoning in the clinical area involves more than an application of theoretical knowledge learned in the classroom. It requires a combination of theoretical knowledge with clinical experience and the ability to readily identify, judge and make conclusions about changing patient conditions. They concluded that a lack of experience "means graduates can struggle to gain the total picture of a patient's situation, potentially compromising care and safety" (Purling & King, 2012, pp. 3463). Hence, the authors propose the need for the development of new graduates' ability to respond to changing patient conditions, a competence that requires effective clinical reasoning and judgment. In addition, Theisen and Sandau (2013) proposed that effective clinical judgment among new nurse graduates is an attribute sought after by employers in the health field. Therefore, understanding of how new graduates operationalize clinical judgment would shed light on their decision-making processes and reveal how we can better support the development of NGNs clinical judgment.

A review of published work that describes nurses' clinical reasoning identified two main approaches nurses use to engage in clinical reasoning, analytic and intuitive (Carper, 1978; Marino et al., 2019; McCutcheon & Pincombe, 2001; Moylan, 2015; Pretz & Folse, 2011; Tanner, 2006). *Analytic reasoning* is characterized by the use of formal rules, principles, and units of measurements to support, guide and validate decisions and clinical judgments (Marino et al., 2019; Moylan, 2015; Tanner, 2006). An example is the use of the commonly known nursing process in guiding nurses' judgments whereby information-gathering about a condition is followed by a planning phase of inference to form a diagnosis statement, then implementation of

actions based on guiding principles, followed by an evaluation phase which concludes the process (Banning, 2008; Krishnan, 2018). New graduate nurses, who lack the practical experience and contextual knowledge of their senior nurse counterparts typically adopt an analytic approach to reasoning and turn to textbooks to validate information accuracy. Tanner (2006) explains that "beginning nurses…might perform a comprehensive assessment and then sit down with a textbook and compare the assessment data to all of the individual signs and symptoms described in the book" (Tanner, 2006, pp. 207). A linear process of reasoning is therefore implied with the analytic approach and an assumption that information about an illness can be understood by being broken down to its individual components (Banning, 2008, Tanner, 2006). This approach, however, does not account for error in clinical reasoning or judgment nor does it recognize the complexity and dynamic nature of patient scenarios.

A second approach to clinical reasoning identified is an *intuitive approach* which is often said to be used by experienced nurses and has its roots in Carper's (1978) forms of knowing and perceptual awareness of clinical occurrences. Moylan (2015) suggested that intuition "involves the internalized information resulting from both professional and personal experience" (Moylan, 2015, pp. 578). Nurses with clinical experience who have developed a working memory and a sense of knowing or 'instinct', also described as a gut feeling, are able to recognize subtle cues and patterns about patient conditions or clinical scenarios gleaned from multiple exposures (Benner, 1982; McCutcheon & Pincombe, 2001; Melin-Johansson et al., 2017; Moylan, 2015; Nibbelink & Brewer, 2018; Pretz & Folse, 2011). Pretz and Folse's (2011) quantitative study involving 175 nurses suggests that unlike novices, nurses with experience have established organized thinking and recognition patterns causing them to use intuitive reasoning in practice based on an awareness of presenting signs and symptoms about the clinical scenario and their

ability to interpret the presenting clinical cues. Similarly, Melin-Johansson et al. (2017) integrative review that examined clinical intuition in the nursing process and decision-making suggested that intuition develops over time, and nurses with experience who use intuitive reasoning have developed confidence in their ability to analyze their thinking that has resulted from multiple exposures over time. Authors suggest that factors that influence the use of intuitive reasoning are experience, patient complexity, level of knowledge and level of skill (Melin-Johansson et al., 2017).

The process of clinical reasoning and judgment by nurses seems to occur on a continuum ranging from analytic to intuitive, with nurses fluctuating between both ends of the continuum based on their life and practice experience, and the complexity of the clinical situations to which they have been exposed (Hassani et al., 2016; Nibbelink & Brewer, 2017; Parker et al., 2014; Tanner, 2006). For instance, Parker et al. (2014) examined new graduate nurses' experiences in their first year of practice and found that depending on their individual capacity from past life or additional work experiences, NGNs can have transitions to the workplace that, while primarily dependent on analytical approaches to thinking and problem solving, also include the development of their ability to reason intuitively. Conversely, Nibbelink and Brewer's (2017) integrative review suggested that experienced nurses who primarily utilize intuitive reasoning can revert to the use of analytic approaches when faced with unfamiliar circumstances leading to the use of protocols to guide and support their clinical judgment.

Other forms of clinical reasoning utilized by novice nurses are consultative in nature. Rather than referring to procedural standards, new graduate nurses first consult with colleagues, utilizing the opportunity to dialogue to inform them of their reasoning position. Thoughts and

ideas are exchanged, and rationales are shared (Clarke et al., 2013; Purling & King, 2012). This exchange appears to occur in an informal and non-systematic fashion.

Contextual factors both support and hinder new nurses use of rationalist, intuitive or consultative approaches (Thompson et al., 2017). The decision by a nurse to engage in either a rational or intuitive approach depends on organizational culture and standards of work (Rohde & Domm, 2017) as well as the complexity of the clinical scenario (Voldbjerg et al., 2016). New graduate nurses' engagement of clinical reasoning remains under-explored as most studies that describe effective reasoning and decision-making are speaking of nurses with previous clinical experience. Consequently, an in-depth understanding of clinical reasoning mechanisms engaged by new graduate nurses is needed to better understand how their transition into the workplace informs their clinical reasoning. There is also a need to move beyond "show-and-tell" practices in the clinical area to develop and promote a deeper and broader understanding of clinical reasoning.

In summary, both new graduate and experienced nurses utilize analytic and intuitive reasoning approaches and can fluctuate between both methods based on the complexity of clinical scenarios, their life and work experience, and confidence in their ability to utilize intuitive reasoning (Hassani et al., 2016; Nibbelink & Brewer, 2017; Parker et al., 2014). New graduates typically utilize analytic reasoning and consultation with their senior nurse colleagues when faced with clinical scenarios in practice. The literature available suggests that a theoretical framework to describe NGNs' clinical reasoning and the attributes that characterize and contribute to the development of their reasoning and decision-making ability is not fully understood. Such knowledge would add to transition to practice programs in such as way as to promote the development of clinical knowledge and perceptual awareness and to make clearer

the appropriate reasoning, judgement and decision-making expectations that can be applied to NGN practice. This research project seeks to contribute to this area of study through examining the cognitive processes, clinical reasoning, and clinical judgements of NGNs during their first year in the workplace.

Significance of Research. The importance of developing new graduate nurses' clinical reasoning has implications for health care organizations, the quality and safety of overall nursing care and the practice performance of individual nurses. Clinical performance issues demonstrated by an inability to make sound clinical judgment have been identified by both new graduates and experienced nurses who transition into new or specialty-work areas (Al-Dossary et al., 2016; Baumann et al., 2018; Chicca & Bindon, 2019). Despite the implementation of transition programs to support learning, little is known about the processes involved in promoting clinical reasoning skills. For instance, Al-Dossary and colleagues (2016) examined the clinical decision-making skills of new graduate nurses using self-administered questionnaires. While study participants reported an increased perception of their clinical decision-making ability by the end of the residency program, how participants arrived at their decisions remained unclear. The implementation of supportive programs without a clear and systematic process that supports the development of clinical reasoning in the newest practitioners is ineffective at best and unsafe at worst. My study will attempt to shed light on the new grad's clinical reasoning attributes and how the growth of this critical skill can be nurtured.

Literature instructs on strategies that can develop clinical reasoning among new graduate nurses including the importance of context and the use of case scenarios to promote the development of clinical reasoning among new graduates (Custers, 2018; Jessee, 2018; Missen et al., 2015; Parker et al., 2014). Custers (2018) suggests the benefits of using case-based

approaches to foster clinical reasoning through probing discussions and open-ended questions: "if clinical reasoning can neither be taught as a pure process nor directly as a skill, teaching it in a case-based format might be a proper middle ground" (Custers, 2018, pp. 29). Similarly, Missen et al. (2015) suggested the development of clinical reasoning through encounters with patient scenarios which new graduate nurses have little exposure to when they enter the workforce. In their study, participants who had prior work experience in other patient care roles were able to better manage clinical tasks, but this did not add to their clinical reasoning ability. The development of clinical reasoning is multifaceted (Jessee, 2018) and the role of pre-graduate education within schools of nursing programs and its influence on the development of clinical reasoning and judgment is not clear. Thompson and Stapley (2011) conducted a systematic review that found a broad range of interventions used to improve nurse's clinical decision-making, including integrating clinical components within scenarios to generate decision-making processes which can reveal reasoning attributes, facilitators, and barriers to its development. Building on this work, my research will utilize clinical scenarios with the intent to reveal new graduate nurse's clinical reasoning attributes, factors that support or impede effective clinical judgements, and the influences of contextual factors on clinical reasoning in order to inform onboarding practices and support new graduate nurses entering the workforce.

The clinical reasoning abilities of new graduate nurses have potential implications related to quality care and safety for health care organizations and for patients (Lindfor & Jinttila, 2014; Saintsing et al., 2011). The perceived risk presented by a nurse's under-developed ability to engage in effective clinical reasoning is further complicated by perceptions about NGNs readiness to enter an increasingly complex work environment that is more and more characterized by high patient acuity levels and reduced support for gradual and supported clinical

development (Mirza et al., 2019; Kavanagh & Szweda, 2017). For example, in the United States, Kavanagh and Szweda (2017) examined practice readiness of newly graduated nurses and discovered a persistent disconnect between preparatory requirements to successfully pass the registered nurse licensure examinations and what is required to competently practice in clinical settings. NGNs report high levels of risk and resulting safety implications when errors occur as a result of poor clinical judgment (Saintsing et al., 2011); our inability to place NGNs in contexts appropriate to their clinical reasoning capability may be contributing to these errors. The conducted study explores specific contextual factors and cognitive reasoning behaviors and patterns new graduates engage in during clinical decision-making to better understand and mitigate risks related to patient care. This doctoral research addresses NGNs clinical reasoning and decision-making through the following research questions**:** 1**)** What challenges do NGNs face at 3 months and at 12 months of transition into the clinical workplace? 2) What assists NGNs in recognizing patient change? 3) How do NGNs engage in clinical reasoning and decision-making? and 4) What factors contribute and impede NGNs clinical judgment abilities?

Chapter Two: Literature Review-Part One

The purpose of this chapter is to situate my study in a review of the current scholarly conversations in the field of the clinical reasoning and judgement abilities of newly graduated nurses (NGN). A review of literature revealed a sizeable number of works published as scoping reviews, integrated literature reviews and empirical research that examine the clinical reasoning and challenges NGNs face in the practice of patient care as they transition into the professional nurse role. In addition to review articles, this chapter includes consideration of scholarly papers reporting original, largely qualitative, research conducted in the United States, Canada, Europe, and Australia and fewer studies which utilize quantitative, mixed methods, and comparative designs. No Canadian research was identified that examined NGN's processes of clinical reasoning and judgement upon entering the workplace. To fill this knowledge gap, and understand the landscape of research in the field, an integrated literature review of original research articles and published review articles that examine NGN clinical reasoning and decision-making was undertaken. This review of the literature allowed me to synthesize current published work on NGN clinical reasoning and decision-making and identify current knowledge gaps in the field. These processes enabled me to better situate my research in the scholarly conversation of NGN clinical reasoning and judgement. In conducting this comprehensive review of the literature, I used inclusion and exclusion criteria during the search and thematic analysis to identify, synthesize, summarize, and report the results (Whittemore & Knafl, 2005). Based on the overall research question, the following question framed my review of the literature: What does the research literature say about 1) how NGNs engage in clinical reasoning and decision-making? and 2) what factors contribute to and impede NGNs clinical judgement abilities?

My search strategy is presented below followed by a synthesis of the key themes present in the literature addressing new graduate clinical reasoning and decision-making. This synthesis is followed by a section addressing the knowledge gaps. The next section of this chapter will present an overview of how clinical reasoning among nurses in practice is conceptualized in the literature, followed by a conclusion to end this chapter.

Search Strategy

A search of EBSCO's CINAHL, Ovid Medline and Scopus from each database's inception until December 2022 was done. The search terms used included "novice nurses" or "new graduate nurses" combined with the terms "clinical reasoning" or "clinical judgement" yielding a total of 1,032 references published within the periods of 2012 to 2022. After duplicates were removed, there were 685 references remaining. Furthermore, the Grey literature was explored by searching the World Wide Web for nursing association websites such as Canadian Nurses Association (CNA), College of Nurses of Ontario (CNO), Canadian Association of Schools of Nursing (CASN), and university program databases, for position papers and theses research describing new graduate nurses' clinical reasoning and judgment upon entering the workplace. In addition, the reference lists and bibliographies of the articles were also reviewed to identify other relevant authors and their work on NGN clinical reasoning, particularly if they significantly added to the knowledge of NGN clinical reasoning and judgment. The search was limited to English language publications in the ten years between 2012 and 2022. Due to time lapse with completing thesis research, a search between 2022 and 2024 was completed and no new papers that added new information were found. No other limits were applied to the search strategies. The results were uploaded onto Covidence for further

screening. Covidence is a systematic evidence review management platform for academic, health and social sciences disciplines (https://www.covidence.org/).

Findings.

A review of the literature revealed a sizeable number of review articles, discussion, or commentary, pilot studies, project evaluation papers as well as empirical research papers made up of qualitative, quantitative, and mixed methods research designs that examine NGN practice challenges and their ability to make sound clinical judgments. Review articles included literature reviews, integrated, systematic and scoping reviews. Review papers and original research articles included work that considered new graduates' lack of work experience, the influence of work specialty or setting on NGNs reasoning and practice performance, and the role of healthcare organizations in supporting the development of clinical reasoning among new graduates entering the workplace. Most articles were descriptive: some compared novice reasoning with that of expert nurses, while other articles explored NGNs' reasoning within specialty work areas. Other articles described NGNs' clinical reasoning and judgment using educational strategies that used simulation and reflective practice scenarios. Using an inductive process to synthesize and analyze the literature revealed a consensus that NGNs enter the workforce lacking adequate clinical practice knowledge and competence to safely provide nursing care to complex and rapidly changing patient conditions. In the sections that follow I organize this review, with reference to original research and published review articles, according to three main themes: 1) effective patient management and situational awareness, 2) clinical education and contextual learnings, and 3) active-learner role. These themes will be presented while highlighting areas for future research next.

Effective Patient Management and Situational Awareness

The current literature reveals that NGN's commonly present a lack of situational awareness of patient conditions and occurrences resulting in uncertainty and the inability to effectively manage, anticipate and determine an appropriate next step involving patient conditions. This is particularly evident when conditions are complex and multifaceted and require responses from NGNs that stand in contrast to the actions of experienced nurses who have developed a working knowledge about how to respond to presenting clinical conditions. Evidence across a range of literature suggests that there is a need for attention to be given to developing NGNs' cognitive reasoning about patient conditions.

NGNs enter the workforce with limited exposure and experience with clinical scenarios and patient presentations of illness, which impacts their ability to manage or anticipate changing patient health conditions (Flaunders et al., 2017; Kavanagh & Szweda, 2017; Shinnick, 2022). A mindset shift about clinical competence in the workplace is needed; one that considers the critical nature of cognitive clinical practice and knowledge development of NGNs as they integrate into various workplaces and grow professionally. Additionally, an understanding of clinical competence that includes cognitive reasoning and high order thinking processes is essential to NGN practice development (Lasater et al., 2015; Price et al., 2017; Sarfield, 2013). With health care environments imbued by increasing patient complexity, a high level of variability in symptom presentation, patterns and clinical cues, we need to consider a shift from task performance to the support of integrated clinical reasoning application. The expectation that graduate nurses will simply meet institutional practice routines by completing a checklist is insufficient to prepare them to adequately manage rapidly changing patient conditions in a workplace fraught with chaos and complexity. Currently, nurses who can complete specific

routines within designated time frames are deemed *capable* of working optimally in the contemporary healthcare environment (Ironside et al., 2014).

An inability to effectively manage patient complexity is exemplified in Shinnick's (2022) multi-sited research design that compared the abilities of novice and expert nurses to recognize clinical cues associated with deteriorating patient status. This study found that novices spent more time looking at isolated clinical *facts* without fully grasping their holistic meaning. Shinnick (2022) argued that "the dwell time and the number of fixations on the SpO2 [percentage blood oxygen level] by the novices was more than double that of experts. Novices had awareness enough to look at the SpO2 on the monitor but took longer to grasp its meaning and importance" (Shinnick, 2022, p. 62). Novice nurses seem to have the ability to recognize clinical abnormalities but lack an in-depth understanding and awareness of the clinical implications. In contrast, experienced nurses in Shinnick's (2022) study based their understanding and decisions on prior exposure to 'like' situations, which enhanced their ability to recognize, interpret and act on the salient features of the clinical scenario; this situational awareness was determined to be critical to high level decision making. Consequently, it was determined that an under-developed situational awareness led to delays in action and an incapacity to manage deteriorating patient conditions resulting in NGNs having to seek directions from guidelines and from physician orders (Shinnick, 2022). This study draws attention to the need to improve the *noticing* ability of new graduates and infers the need for future research that explores clinical reasoning of novice nurses entering the workforce to understand the processes they engage in when making clinical decisions. Lasater and colleagues (2015) argued that checklists used in health care organizations do not require nor develop thinking competency or ability and are, in the context of the new practitioner, insufficient in

applying or deepening reasoning ability that can lead to effective management of complex patients.

It is apparent from the literature that NGNs lack situational awareness of varying patient conditions and levels of complexity due to limited exposure and inexperience with these conditions (Custer, 2018; Melin-Johansson et al., 2017; Murray et al., 2017; Nibbelink & Brewer, 2017; Saintsing et al., 2011). Under-developed clinical reasoning and clinical decision-making ability of NGNs can lead to unsafe practices and a compromised quality of care (Reebals et al., 2022; Saintsing et al, 2011). Given the NGNs' inexperience, it is necessary for NGNs to take on an active learner role when they enter the workplace (Custers, 2018; Saintsing et al., 2011). Clinical reasoning and judgement are context and situation specific and ongoing experience over time allows reasoning capacity to develop as NGNs gain repeat exposures to a range of patient and clinical scenarios. Expert nurses with prior experience and exposure to multiple and varied clinical scenarios have developed a confidence in their use of intuitive reasoning (Melin-Johansson et al., 2017; Nibbelink & Brewer, 2017); these distinctions in reasoning account for the differences in how new graduates and expert nurses' reason through clinical scenarios (Marino et al., 2020). NGNs lack confidence in their reasoning abilities, which contributes to delays or hesitancy in their responding to patient needs (Gonzalez et al., 2021). In addition, prior research suggests that NGNs perceive themselves as incompetent in areas pertaining to communication, patient care activities and nursing leadership (Kaldal et al., 2022). To optimize patient care management an in-depth understanding of NGN cognitive processes is warranted (Gonzalez et al., 2021).

In addition to concerns about effective patient management, the literature also reports that NGNs are uncertain about the practice steps required when facing complex or changing clinical

scenarios. Research indicates that NGNs are typically unable to notice patient clinical patterns presented outside of their frame of reasoning, which leads to their uncertainty about appropriate next steps. Research further reveals that NGNs are unable to grasp peripheral occurrences about clinical scenarios (Lavoie & Pepin, 2013; Lasater et al., 2015; Monagle et al., 2018; Sarfield, 2013). Novice nurses engage in simple rationalistic level thinking demonstrated, by their precise task processes, an inability to engage in integrated higher thinking patterns such as those demonstrated by their more experienced colleagues. NGNs are less *tactical* than experts who use non-analytic pattern-recognition (i.e., intuitive) with typical case presentations and are more intentional and calculated in their approach to difficult clinical problems (Andersson et al., 2012; Gonzalez et al., 2021; Lavoie & Pepin, 2013). To illustrate NGN uncertainty in their reasoning patterns, Sarsfield's (2013) descriptive qualitative study compared NGNs and expert nurses' reasoning and ability to resolve unplanned clinical problems in a public health practice setting. Findings suggested novices engaged in a linear pattern of reasoning through patient scenarios. In describing the problem-solving techniques of nurses, Sarsfield (2013) stated that "experts used conversion, converting the problem to one that the individual [referring to the expert nurse] has solved in the past, more frequently than novices did"; in addition, "the expert used their experience with similar situations to plan how they would solve the problem in comparison to only one NGN out of the 12 participants [who] used conversion as a problem-solving method" (Sarsfield, 2013, pp. 448) Expert nurses in Sarsfield's study provided a "description of subproblems were multifactorial, richer, and more detailed than the novices' linear description" (Sarsfield, 2013, pp. 448). Unlike the novice nurses, expert nurses were able to recontextualize presenting patient problems based on past experiences with similar clinical conditions. Familiarity with clinical scenarios aided recognition of clinical patterns and specific clinical

knowledge about the clinical situation which novice nurses lacked, making them dependent on checklists and guidelines (Lasater et al., 2015; Sarsfield, 2013). Given the claims that NGNs' clinical reasoning reflects a linear trajectory, there is value in further understanding, and seeking to develop the cognitive and experiential processes engaged in during the initial professional role transition period. Nibbelink & Brewer (2017) suggested a combination of multiple clinical teaching approaches to support the development of clinical reasoning among NGNs. It is noted by Thompson and Stapley (2011) that educational interventions alone may not have the necessary impact on changes to NGN performance or behavior. Further research that makes explicit NGNs' clinical reasoning in the workplace will inform our understanding of how-to better support nurses entering the profession.

Andersson and colleagues (2012) examined differences in clinical reasoning among nurses working in highly specialized pediatric care areas, concluding that novices engage in task-oriented reasoning focusing on isolated clinical problems. In their experience, "groups with [a] task-oriented approach [novices] handled clinical cases similarly to a task given in an educational setting, meaning that they usually started from the case instructions, identified triggers given in the case and discussed or questioned them in a general way, i.e., did not discuss them in relation to the given case" (Andersson et al., 2012, p. 873). Novice participants identified and addressed clinical problems in isolation without association to possible underlying causes and lacked deep analysis of the clinical situation (Andersson et al., 2012). Concurrently, not only did the NGNs address problems or tasks in isolation but, like the NGNs in the aforementioned studies by Lasater et al. (2015) and Sarsfield (2013), they were uncertain about appropriate next steps. Meanwhile, nurses with work experience generated suggestions about possible interventions to address the scenario and were able to grasp the complete case in a detailed

fashion. Experts “rarely drew conclusions based on the hypotheses as the novice group did; their responses were based on previous knowledge, their own personal experiences or the acquisition of new knowledge. They rarely suggested specific actions without stating several alternatives” (Andersson et al., 2012, p. 874). Even though authors found expert nurses with experience more competent, and their responses more comprehensive in nature, the expert’s competence was situation specific and not predetermined (Andersson et al., 2012). This suggests unique attributes in the reasoning pattern of both novice and expert nurses that highlight the need to further explore differences in their reasoning processes and abilities with real clinical scenarios. NGNs’ lack of situational awareness contributed to their uncertainties and an inability to manage complexities of clinical situations. As a result, NGNs resort to cross-check guidelines and formalized structures to guide clinical actions, yet the reasoning processes involved, and its evolution remains unknown.

NGNs’ lack of situational awareness, combined with the high cognitive load required in this dynamic contemporary healthcare context contributes to information processing challenges when managing complex clinical scenarios (Custers, 2018; Kumar et al., 2019; Murray et al., 2017). Increased efforts to establish transition-to-practice (TTP) programs, enhanced efforts to develop the clinical reasoning, judgment, and decision-making performance of NGNs within the workplace are called for. Comparative studies that examine NGNs and expert nurses’ reasoning and clinical decision-making exist, as do studies that examine nurses’ decision-making within specialty settings. Few studies, however, have exclusively examined NGN clinical reasoning processes involving patient care within acute care settings. Gonzalez et al. (2021) recommended the need for more studies that could shed light on the cognitive processes needed for NGNs to make sound clinical judgements and Murray et al. (2017) highlighted the need to understand how

NGNs' think through clinical scenarios with an emphasis on how that thinking translates into their clinical insights. This doctoral research hopes to contribute to addressing this knowledge gap in published evidence about NGNs.

Clinical education and contextual learnings

The literature draws attention to the need to foster knowledge application among NGNs as they enter the workplace, the goal of which is to minimize the effect of NGNs' under-developed clinical decision-making ability on patient outcomes. Scholars argue that organizational practices that foster the development of knowledge application skills are vital to safe patient care (Benner et al., 2010; Kavanagh & Szweda, 2017). The ways in which workplaces influence the development of clinical reasoning and judgement among NGNs is of interest, given NGNs' minimum exposure to clinical scenarios and their lack of familiarity of presenting clinical symptoms and patterns, coupled with the presence or absence of effective practice development protocols in the workplace.

Performance gaps among NGNs related to their level of clinical knowledge and competency upon entering the workforce are acknowledged in the literature (Benner & Wrubel, 1982; Kavanagh & Szweda, 2017). These gaps are exemplified in Kavanagh and Szweda's (2017) study that sought to quantify NGN preparation-to-practice upon entering the workplace. Those authors claimed that NGNs lack the clinical knowledge to engage in safe practice when they enter the workforce. In applying theory to practice, NGNs generally *recall* materials learned in academic settings and approach clinical scenarios with a textbook frame of mind (Oliver & Butler, 2004). Clearly, the development of clinical reasoning and decision-making competence is necessary for safe practice. This said, effective development of reasoning competence in NGNs

does not occur in isolation; it involves contextual influences and education, training, and support of evolving knowledge application.

When new graduates enter the workforce, they are often paired with a designated resource person identified synonymously as a preceptor, mentor or coach[1] to support workplace learning (Bakon et al., 2018; Rush et al., 2019; Strauss et al., 2016). However, preceptors tend to view their role primarily as task and performance driven clinicians (Trede et al., 2016). They may lack pedagogic competencies to facilitate and evaluate high-level thinking and learning, with many describing themselves as "clinician experts and not expert teachers" (Powers & Herron, 2019, p. 135). Although preceptors play a crucial role in developing skill competency, which contributes to clinical reasoning, evidence suggests preceptors are themselves ill-equipped to teach higher-level clinical thinking (McSharry & Lathlean, 2017). Kavanagh and Szweda (2017) argue that "curricular changes that foster critical thinking skills and clinical reasoning and offer guided learning opportunities that facilitate the transfer of knowledge to practice are essential to promote positive transitions to the role of professional nurse" (Kavanagh & Szweda, 2017, p. 61). Knowing this, the role of workplace environments in facilitating the development of clinical reasoning among nurses entering the workforce is vital. Nursing practice encompasses clinical reasoning, clinical judgement, and clinical decision-making (Oliver & Butler, 2004), yet NGNs lack this essential competency. Work environments and employers are left with the task of shaping NGN knowledge translation, skills transfer and competency development during their transition. Benner (2012) argues for a collaborative partnership between health care

[1] In this study I will adopt the term preceptor except where I am making distinctions between the roles.

organizations and academia that support an integrated skill and cognitive competency-based NGN workplace transition that can optimize patient safety and quality care.

Work environments are best positioned to contribute to the development of clinical practice knowledge, given that they represent every aspect of nursing competency (Benner, 2012; Kavanagh & Szweda, 2017; Lasater et al., 2015) and provide for situation-specific awareness (Andersson et al., 2012). Oliver and Butler's (2004) comparative ethnographic study examining novice and expert nurses' decision-making and problem-solving abilities argued that nurses' clinical knowledge and competencies were based on the type of patient units they worked in. Those authors argued that "the ward activities within their clinical milieu dictated the type of experience to which they were exposed" (Oliver & Butler, 2004, p. 24). NGNs' involvement with everyday clinical activities involving patient care, interdisciplinary collaboration and organizational process expose them to clinical learning opportunities which foster clinical reasoning and judgment responsibilities that, in turn, promote information processing and the recontextualization of new knowledge. This highlights the notion of learning in practice and the fact that clinical reasoning cannot be understood in isolation from the environments in which it occurs. Contextual factors can either hinder or enhance a nurse's ability to recognize as well as encourage the search for further clinical cues. The knowledge about how NGNs process clinical information cognitively and transform it into new clinical knowledge is vital for health care organizations. An all-round transformational learning environment requires corporate commitment to maximize the benefits of the teaching and learning pairing (NGN and preceptor) and for NGNs to understand the meaning of different patient diagnosis and symptom presentations.

Marino et al. (2020) identified experience, intuition, the use and source of information, and workplace environments as factors that shape nurses' clinical reasoning abilities. Clinical decision-making is learned (Marino et al., 2020) but the influence of education alone in improving clinical reasoning is not possible without the inclusion of clinical performance components (Thompson & Stapley, 2011). Several pedagogical approaches have been identified that improve NGNs clinical reasoning and judgment as they enter the workforce, including concept learning and reflective practices (Gonzalez et al., 2021). Research that examines the impact of transition-to-practice programs on resolving the competence gaps for NGNs are inconclusive (e.g., Rush et al., 2019; Strauss et al., 2016; Tyndall et al., 2018); practice incompetency among NGNs persists despite TTP programs (Reebals et al., 2022). Professional development that fosters the transformation of NGNs' cognitive awareness and adds to their mental capacity cannot rely solely on the theoretical knowledge of a single nurse with experience due to differences in levels of practice competency, evaluation, and exposure to patient complexity which feeds a nurse's capacity to 'know' (Chant & Westendorf, 2019). The responsibility for facilitating this practice knowledge development cannot just be the responsibility of managers or educators at the workplace point of contact (Doughty et al., 2018). Healthcare environments and patient acuity levels have become increasingly complex and demanding (Chesak et al., 2015; Edwards et al., 2015), making the ability to standardize content in the teaching-learning dyad a challenge (Strauss et al., 2016). A multi-level commitment to onboarding NGNs is likely to promote a combination of teaching strategies to facilitate learning and foster high level reasoning and judgement competence.

Active learner role

Complementary to the importance of fostering knowledge application for the development of clinical reasoning and integrating the role that clinical context plays in facilitating the development of NGNs' clinical reasoning is the responsibility of the NGN in growing their own clinical reasoning abilities. The research speaks to educational strategies that promote NGNs' involvement in active learning and recommends ways to foster NGNs' dispositions for making sound clinical judgement. Given that the NGNs' application of reasoning is initially superficial, and they rely on checklists and other objective guidelines, research calls for the integration of more efficient pre-graduate and transitionary educational strategies to improve NGNs' clinical reasoning ability as they prepare to enter the workforce (Lasater et al., 2015; Sarsfield, 2013).

NGNs enter the workforce with little or no situational awareness of clinical occurrences surrounding patient care, particularly those with increasing complexity (Flanders et al., 2017; Ironside et al., 2014; Lavoie & Pepin, 2013; Missen et al., 2015; Price et al., 2018; Shinnick, 2022). Flanders and colleagues (2017) proposed the use of "advanced cognitive skills training programs" (Flanders et al., 2017, pp. 245) using simulations involving reflective debriefing to reveal and make explicit reasoning patterns used by their more senior nurse counterparts. Similarly, Lavoie and Pepin (2013) identified reflective debriefing as one means of developing clinical reasoning among NGNs, alluding to the fact that NGNs notice elements that align with their expectations that are often drawn from their formal educational knowledge (Lavoie & Pepin, 2013). Reflective debriefing would actively involve the learners in their own cognitive development and awareness by capitalizing the role they play in their own professional growth and development. When health care organizations move from passive didactic approaches to active engagement during on-boarding and transition training programs, NGNs are likely to have

an increased awareness of the clinical reasoning performance levels and the areas needing improvements (Lavoie & Pepin, 2013). Even though nurses with more work experience have a developed working memory of different clinical scenarios and their complexities (Monagle et al., 2018), not all nurses with experience demonstrate depth of clinical reasoning (Flanders et al., 2017). The use of reflective exercises among NGNs should be aimed at developing tacit awareness and an understanding of meaning as it pertains to the clinical occurrences.

In addition to reflective debriefing, other means of actively involving NGNs in the development of their clinical decision-making is through using clinical scenario teaching (Ironside et al., 2014; Price et al., 2018). With NGNs' reliance on analytic reasoning approaches (Price et al., 2018), actively involving them cognitively to consider that which exists beyond the task completion is crucial to the development of their cognitive insight (Missen et al., 2015). For instance, Ironside and colleagues (2014) suggest the need for nurses to explore the thinking patterns behind their actions versus basing competence on simple task completion. Promoting higher level thinking through scenario pre and debriefing has the potential to promote meaning development and understanding and would be valuable in developing clinical reasoning abilities in novice nurses.

Clinical reasoning is a teachable skill with the clear potential for development (Benner et al., 2010; Jessee, 2018; Michels et al., 2012). With patient safety as a health care priority, organizational practices and policies tend to shape NGN actions as they enter the workforce. As such, nurses' clinical reasoning is influenced by organizational policies within the given work setting (Campbell et al., 2018). In specialty settings like mental health or cardiology units, the NGN's familiarity with the patient's disease were influenced by organizational and specialty standards which direct nurses' ability to engage in effective clinical judgment. For instance,

"clinical decision-making in the context of aggression and seclusion judgments are formed to preserve safety" (Campbell et al., 2018, pp. 7). While good clinical reasoning abilities are rewarded when patient outcomes are improved, it is unclear how guidelines and policies foster the NGN's understanding of clinical conditions and assist in their early recognition of changes in patient status, situational awareness and management of illnesses and disease progression. In situations of risk, reasoning and judgments are influenced by organizational policies and protocol (Moylan, 2015), while familiarity with a patient's disease condition and behavior also influences clinical reasoning (Laiho et al., 2013). The decision by a nurse to engage in either a rational or intuitive approach depends, at least in part, on organizational culture and standards of work (Rohde & Domm, 2017) as well as the complexity of the clinical scenario (Voldbjerg et al., 2016). Therefore, it is important to integrate ways to promote early recognition and situational awareness among NGNs and involve their active participation and the use of organizational policies and guidelines in nurturing NGNs' mental capacity to reason through and manage patient complexity as they enter the workforce. The development of NGNs clinical reasoning ought to be ongoing, engaging them as active participants in clinical learning circumstances, and the evaluation of their understanding of clinical situations and pattern recognition is necessary alongside this learning. A culture of persistent support for nurses' development of clinical reasoning has implications for health care organizations, patients, and individual nurses.

Conclusion. The current landscape of scholarly research examining NGN clinical reasoning and judgement suggests an international consensus on the limited clinical knowledge NGNs have upon entering the workforce. Specifically, NGNs are not adequately supported as active learners and they lack experiential realities of knowing the appropriate next steps to take to safely manage complex and chaotic clinical scenarios. As a result, they struggle with

uncertainties as they strive to effectively manage patient situations and develop their clinical reasoning competency despite the use of designated support person(s). The literature sheds modest light on how NGNs can grow their clinical performance and competency. The literature offers us some insights into why NGNs struggle with certain practice competencies, but it does not advance our understanding of NGN cognitive processes and clinical decision-making capacity. This doctoral research seeks to address that gap by following NGNs in the first year of professional practice to make explicit the cognitive processes they engage in when faced with clinical scenarios in the workplace. NGNs are central players in the development of clinical reasoning and decision-making competencies in the workplace; however, it takes a corporate commitment on all levels to promote comprehensive educational strategies that foster transformational learning experiences for the new graduates. Such an approach acknowledges that clinical knowledge and decisions are influenced by the context in which it occurs. Results of such studies will further build on defining NGNs' reasoning attributes and further the development of comprehensive teaching programs within health care organizations.

Part Two: Conceptualizing Clinical Reasoning Among Nurses in Practice.

Inexperience and an unfamiliarity with complex clinical scenarios of the contemporary workplace make 'thinking in action' difficult for the newly graduated nurse to reason, recognize clinical trends, and integrate clinical information holistically to inform an appropriate action or decision (Benner, 1982, 1984; Jessee, 2018; Mirza et al., 2014; Missen et al., 2015; Modic, 2013; Murray et al., 2017). An awareness of clinical processes within work settings that require the use of clinical reasoning is vital, especially since clinical decisions are constantly made in environments characterized by high patient acuity levels where decisions are made quickly and

with significant consequence (Baumann et al., 2018; Ebright, 2012). The themes discussed above describe the reasoning challenges NGN's face that impact their ability to engage in effective clinical decision-making. The next section of this chapter will integrate Benner (1982), Ebright (2012), Kramer et al. (2013) and Duchscher's (2008) theories to create a conceptual framework for further exploring how NGNs engage in clinical reasoning and the contextual elements that promote or hinder their ability to recognize change in patient status. An analysis using these four frameworks is necessary to understand and inform how the development of clinical reasoning among new nurses within clinical settings can be better supported. In addition, a theoretical analysis will bring clarity to the operationalization of clinical judgement and decision making in clinical practice.

Benner's (1982) model of skill acquisition describes nurses' performance based on their cognitive reasoning and knowledge development abilities. Ebright's (2012) human performance awareness model describes the complexity of health care environments as they influence and impact on the nurses' ability to perceive changes in patient status and to engage in appropriate responsive behaviors. Kramer and colleagues (2013) complexity adaptive systems framework portrays the clinical environment and patient conditions as complex, dynamic and interrelated systems. Duchscher's (2008) stages of professional role transition describes how NGNs evolve professionally during their initial 12 months in practice; the model encompasses the physical, psychosocial, emotional and cognitive elements that influence and are influenced by this initial professional transition.

Benner's Model of Skill Acquisition and NGN's Clinical Reasoning

Benner's model of skill acquisition is adapted from the Dreyfus and Dreyfus model of skill performance (Dreyfus & Dreyfus, 1980). Benner's model describes the development of

nurses' skill performance, cognitive reasoning and offers insight into how nurses evolve in their skill development over time (Benner, 1982). (See Appendix A for a summary table of Benner's model). Benner suggests that the development of cognitive reasoning and performance in nurses is based on past experiences as they move through five performance levels: novice, advanced beginner, competence, proficient and expert. For NGNs entering a new practice environment, research shows that an inability to manage patient complexity characterizes their transition due to inexperience and lack of confidence in their knowledge and abilities (Chesak et al., 2015; Edwards et al., 2015). Cognitive recognition of deviations or omission of clinical information or symptoms begins the reasoning process (Benner, 1984; Nibbelink & Brewer, 2018; Tanner, 2006). According to Benner (1982), NGNs are likely to be either in the novice or advanced beginner category, both of which demonstrate an under-developed ability to recognize clinical cues. Novices have little to no concrete or situational experience to aid with pattern recognition and so rely on rules and objective measures; the advanced beginner has some recurrent exposure to clinical situations and scenarios which creates meaning and forms mental construes based on those experiences (Benner, 1982, 1984, 2001a). Unlike novices, advanced beginners' recognition of a clinical scenario occurs holistically, yet intricate differences within the clinical scenario go unrecognized. A clinical example can be illustrated with a shortness of breath (SOB) scenario, where the symptom is recognized as a larger whole but distinguishing the nuances related to causation (i.e., SOB caused by heart failure versus heart valve insufficiency) remains challenging. In nursing, good clinical reasoning includes the recognition and consideration of possible reasons for a clinical situation while at once being able to eliminate those options that do not quite fit. An in-depth understanding of how NGNs engage in this fundamental ability is

vital to engage them in further professional growth, to assure patient safety, and optimize outcomes for the health care system (Edwards et al., 2015).

Even though the novice and advanced beginner nurses rely on objective rules, advanced beginners need assistance with setting priorities and recognizing meaningful patterns (Benner, 1982). Using the SOB example above, an advanced beginner needs guidance differentiating between left side and right-side failure. In addition, prescription medications for heart failure can be ordered to primarily extract excess fluid volume whereas with valve insufficiency, medications are prescribed to manage fluid overload and mitigate the reduced cardiac output or forward blood flow. The use of objective criteria to inform novice and advanced beginner nurse reasoning is seen in Rohde and Domm's (2017) integrative review describing nurses' clinical reasoning in safe medication practices. These authors concluded that nurses utilize rational processes to analyze and inform their judgments. Rohde and Domm (2017) suggest these nurses' decisions whether or not to administer medications are based on factors that include assessment knowledge, familiarity with the medication, the condition of the patient and professional standards that guide the safe administration of medication. Novice nurses having minimum practice experience adhere to guidelines and professional standards to inform their clinical reasoning despite "minimal evidence clearly articulating nurses' clinical reasoning in how it [referring to professional practice guidelines] is used to support medication safety" (Rhode & Domm, 2017, pp. e409).

Meanwhile, higher up on Benner's skill acquisition and performance model are the proficient and expert nurse groups who can recognize clinical salience, using their intuition to feed their assessments (Benner, 1982, 2001a; Kramer et al., 2017) Intuition is described as that 'gut feeling' but is actually a heuristic process of reasoning (Marino et al., 2020; Simmons,

2010). According to Benner (1982, 1984) that arises from a familiarity with typical and atypical clinical scenarios; these nurses know when to modify their clinical plans, pick up on nuanced, or salient data, recognize the importance of clinical attributes, and can pick up on the unexpected. Proficient nurses need fewer clinical attributes to determine relevance accurately. Relative to nurses functioning at the proficient level, expert nurses have developed a deep grasp and understanding of clinical scenarios; they engage more intuitively and less analytically due to the years of clinical experience (e.g., 'I've seen this before') that guide their practice and act as a resource for coping with diverse and clinically complex scenarios (Benner, 1982, 1984).

Recent studies in support of Benner's work suggest years of experience and repeated exposure to clinical patterns build confidence in the ability of nurses to "observe and examine patients signs and symptoms beyond the scope of the symptoms revealed by the patient" (Melin-Johansson et al., 2017, pp. 3947; Nibbelink & Brewer, 2018). For instance, an experienced nurse would know that a patient awaiting a heart transplant who has a blood pressure of 85/50 is still capable of maintaining a relatively normal activity level despite their superficial presentation of reduced energy tolerance and pallor. The ability to engage clinical salience is associated with experienced nurses.

Ebright's Human Performance Awareness Model and NGNs' Clinical Reasoning

Nurses are expected to work seamlessly in increasingly complex and fast-paced environments. But complexity and urgency are factors that create stress in the NGN. (Baumann et al., 2017; Chesak et al., 2015; Ebright, 2012; Hunsberger et al., 2013). Ebright's (2012) human performance framework operates on the assumption that workplaces are settings which are highly demanding and complex. These are the settings in which NGNs are providing care to seriously ill patients, and they must demonstrate the ability to perceive and respond to the

multiple demands of patient conditions. The individual cognitive demands, interdisciplinary collaborations and prioritizations involved with this level of patient acuity leave little room for error, creating a risky and complex work environment. Nurses' ability to perceive and understand clinical situations is ground zero [commencing point] for a nurse's actions and is based on three levels of situational awareness: *perception*, *comprehension,* and *projection*. *Perception* describes basic cues activated through the visual, tactile, auditory, olfactory and taste senses which trigger the ability to detect and understand distinctions. *Comprehension* is reflected in how nurses receive, integrate, and assign meaning to multiple sources of data, using that data to inform clinical reasoning and judgment. *Projection* is evidenced in the nurse's ability to predict outcomes or anticipate future occurrences. Nurses with work experience can engage clinical reasoning by a developed working memory (Ebright, 2012). Unlike the NGNs', experienced nurses build their working memory from cognitive factors grounded in contextual and formal knowledge, further informed by their mindset and attention to nuanced details and culminating in actions and outcomes applied to the problems at hand. With this understanding of nurses' performance within complex work environments it is not difficult to conceptualize the vulnerability of NGNs due to their lack of experience and an inability to effectively discern, prioritize or delegate competing patient demands presented in complex clinical situations. It is natural to project that this limited capacity for clinical reasoning will make it difficult to prevent error, recognize patient vulnerabilities and optimize change that advantages patient care.

Kramer's Professional Practice as Complexity Adaptive Systems Model. Kramer et al. (2013) model of professional practice as complexity adaptive systems portrays the clinical environment and patient conditions as complex, dynamic and interrelated components of multiplicity, complexity, and synchronicity. Multiplicity describes multiple occurrences

surrounding patient care typical of complex patients that compete for a nurse's attention as part of the daily responsibility and routine and the ability to recognize and isolate priorities within each complex patient condition. Meanwhile, simultaneity refers to the ability to manage multiplicity occurring at the same time (Kramer et al., 2013). Authors suggest nurses perceive their practice performance as poor when unable to manage multiple patient complexity efficiently. Authors state "the fear of not making the right decision when faced with competing needs/demands from several patients is what causes me not to feel good about myself as a professional nurse" (Kramer et al., 2013, pp. 693). In addition to Ebright's human performance awareness model, unlike experienced nurses who have a developed working memory, NGNs are vulnerable with handling complex patients effectively due to an under-developed clinical pattern preventing them from recognizing patient symptoms beyond the surface level and effectively managing multiple elements of patient information occurring at the same time (Kramer et al., 2013).

Duchscher's Stages of Transition and Transition Shock Framework and NGNs Clinical Reasoning. Duchscher's (2009) theory of the stages of transition and transition shock outline the antecedents that influence the shock experience of newly graduated nurses during their initial introduction to professional practice; specifically, their roles, responsibilities, relationships and application of theoretical knowledge to practice. The stages of transition encapsulate the experiential progression that occurs during the first 12 months in a new graduate's life (Appendix B). The framework consists of three professional stages through which nurses evolve: *doing*, *being* and *knowing*. The underlying premise of Duchscher's transition shock construct, an event that occurs within the first stage of transition, is motivated by the contrast between what is experienced as nursing students and what they find to be their

professional nursing role. This contrast contributes to a lack of confidence and an underdeveloped competence level (Baumann et al., 2018; Duchscher, 2008, 2009; Goode et al., 2016; Lindfors & Junttila, 2014). NGNs may not perceive themselves as capable of performing their required duties due to a mismatch between what they see as an ideal patient scenario and the reality (Duchscher, 2008). The areas in which NGNs lack confidence are critical thinking, decision-making and inadequate knowledge application skill (Lindfors & Junttila, 2014). Such feelings of inadequacy are further complicated by work environments characterized by increasing complexity such as "advancement in technologies, the acuity level of patients, specialization, quality and safety requirements, evidence-based practice expectations, the rapid turnover of acute care patients due to shortened length of stay and the need for increased coordination of care across practice settings" (Goode et al., 2016, pp. 82). The working state of NGNs' clinical reasoning and judgment can lead to unfavorable outcomes for both patients and can contribute to attrition rates (Brewer et al., 2012), compromise quality care, and detrimental effects on personal growth, the development of professional skills and competency (Freeman & Lazenby, 2012).

The *doing* stage (1-4 months after induction) describes the NGNs' move from a structured educational environment to an unpredictable practice environment where they are faced with unfamiliar practices and scenarios for which they are required to make clinical decisions. In this stage, there is a need for NGNs to build resilience as they struggle with their ability to handle workplace complexity. Their identity is shaped by performance, i.e., they feel the need to meet existing collegial expectations as they seek acceptance; they are task-oriented with wavering confidence levels when applying new clinical skills; they are navigating competing social and personal responsibilities. In the *being* stage (4-8 months after induction),

there is advancement in thinking and reasoning, skills, and knowledge. NGNs start to feel comfortable in their professional role; they can now rely on the relationships they have built in the first stage so will seek out support when needed; they are reflexive and begin to examine and critique practices and interventions for appropriateness. Despite these advancements, NGNs may still be insecure in their role, especially as work responsibilities increase. The *knowing* stage (8-12 months after induction) describes a transforming identity where they start to feel and act like professionals. They have developed the ability to prioritize and recognize changes successfully; they manage workplace complexity and are confident with their performance; they begin to seek out more advanced challenges and begin considering future roles and responsibilities. Duchscher (2012) suggested a healthy professional transition occurs when new graduates successfully progress through the stages in a holistic way, not restricted to clinical competencies only. In addition, workplace stability, familiarity, consistency, and predictability are foundational to a healthy progression through the stages of role transition.

Clinical reasoning falls within nurses' professional role (Banning, 2008; Connor et al., 2020; Hong et al., 2021), and that the ability to identify salience within clinical situations is a vital component of effective clinical reasoning. Duchscher's (2012) framework describes a holistic perspective of the professional transformative experience of NGNs during transition, Benner describes the cognitive evolution of nurses including NGNs (novices) while Ebright (2012) explains the simultaneously occurring clinical events and diversity of nurses' workload involved within complex work environments. The intersectionality of these frameworks is likely to build on the understanding of the development of salience as a precursor for clinical reasoning. There are two themes emerging from the frameworks that inform my study: 1) the capacity to operationalize salience and recognition processes involved with patient care, 2)

workplace collaborations or practices that support or hinder clinical reasoning. These themes are currently under-explored with the NGN group.

Salience and Recognition Abilities. The ability to recognize changing patient status is fundamental to the clinical reasoning and judgment processes and consists of interrelated components (Benner & Wrubel, 1982; Boyer et al., 2018). Benefits to early recognition of changing patient conditions are related to both patient safety and the provision of quality care (Rohde & Domm, 2017). Unlike nurses with practice experience, NGNs lack the ability to recognize clinical patterns and operational salience due to limited exposure with diverse patient conditions that, by virtue of their repetition, result in patterns that NGNs can then cognitively access (Jessee, 2018; Modic, 2013; Missen et al., 2015). Since Duchscher and Benner's frameworks propose that the practice of NGNs is initially characterized by a limited knowledge base about patient problems and a narrow experiential lens upon which to judge patterns, it is reasonable to anticipate that these newest professionals will struggle with determining salience and engaging in reasoning of multiple pieces of clinical information simultaneously, synergistically, and holistically. In addition, both of these frameworks suggest that NGNs have not developed organized and informed responses to changing patient conditions such that they can integrate isolated pieces of clinical information in a wholistic and comprehensive way; this is, however, a characteristic of experienced nurses (Benner, 1984; Ebright, 2012; Jessee, 2018; Murray et al., 2019; Thiesen & Sandau, 2013).

In contrast, nurses with practice experience engage simultaneously in responding and reasoning, which include rationalizing, analyzing or intuitively reasoning with clinical scenarios that present a variety of illness conditions (Alfaro-Lefevre, 2017). For instance, Ebright's human performance framework explains nurses' performance with complexity as their ability to

simultaneously reason through clinical scenarios from years of experience (Ebright, 2012) and repeated exposure to clinical patterns (Nibbelink & Brewer, 2018). This ability builds confidence and the capacity to "observe and examine patient signs and symptoms beyond the scope of the symptoms revealed by the patient" (Merlin-Johansson., 2017, p. 3947). Recognizing that NGNs are incapable of engaging salience during the early months of their initial transition to practice, future research should focus on factors that contribute to the development of salience and the timing of NGNs ability to engage salience. These insights would advance our understanding of the NGNs' capacity to apply cognition to evolving patient situations as this often begins the reasoning process (Nibbelink & Brewer, 2018; Tanner, 2006).

Workplace Collaborations or Practices. Health care institutions play a crucial role in facilitating the context within which nurses make clinical decisions (Campbell et al., 2018). Concomitantly, nurses' actions are judged based on the quality of their decisions. Ebright's (2012) human performance framework describes how nurses' ability to make decisions is intimately related to the complexity of the patient care environments and the context within which the nurse is practicing. Contextual factors such as the role nursing colleagues play in the development of clinical reasoning, and what onboarding activities develop or impede the development of clinical reasoning capacity are crucial to optimize the practice prowess of the NGN (McSharry & Lathlean, 2017; Trede et al., 2016). NGNs are assigned clinical placements and participate in preceptorship programs that are often structured, task-orientated or framed on more of a "show-and-tell" between senior and novice practitioners (Audetat et al., 2013; Nielson et al., 2016). Preceptors describe themselves as "clinical experts and not expert teachers" (Powers et al., 2019, p. 135). Although they do play a crucial role in helping NGNs develop their clinical reasoning, evidence suggests preceptors are themselves ill-equipped to teach clinical

thinking and reasoning skills and are lacking in theoretical guidance with their own practice (Chan et al., 2019; Omansky, 2010; Whitehead et al., 2013).

Contextual factors, which include work protocols, policies, and evidenced-based conclusions, can either hinder or support the development of NGNs' salience and clinical reasoning ability (Campbell et al., 2018; Gorini & Pravettoni, 2011; Nibbelink & Brewer, 2017; Rohde & Domm, 2017; Thompson et al., 2016). For instance, Campbell and colleagues' (2018) review of nurses' clinical reasoning in a mental health context suggested that a context-dependent approach to clinical decisions is inevitable. In their review it was clear that contextual factors, including organizational and specialty practice standards, influenced the nurses' clinical judgment. Participants reported making clinical decisions in situations where their safety was at risk; in the context of aggression and seclusion, nurses made necessary judgments which included the need to ensure safety for themselves and others (Campbell et al., 2018). In such situations of risk, reasoning and judgments are influenced by organizational policies and protocols (Moylan, 2015), while familiarity with a patient's disease condition and behavior also influence clinical reasoning (Duchscher & Painter, 2021; Laiho et al., 2013). The decision by a nurse to engage in either a rational or intuitive approach to clinical decision-making depends on the organizational culture and standards of work (Rohde & Domm, 2017) as well as the complexity of the clinical scenario (Voldbjerg et al., 2016). While clinical reasoning and salience development cannot be understood in isolation from the environments in which they occur, little is known about how NGNs engage in these processes.

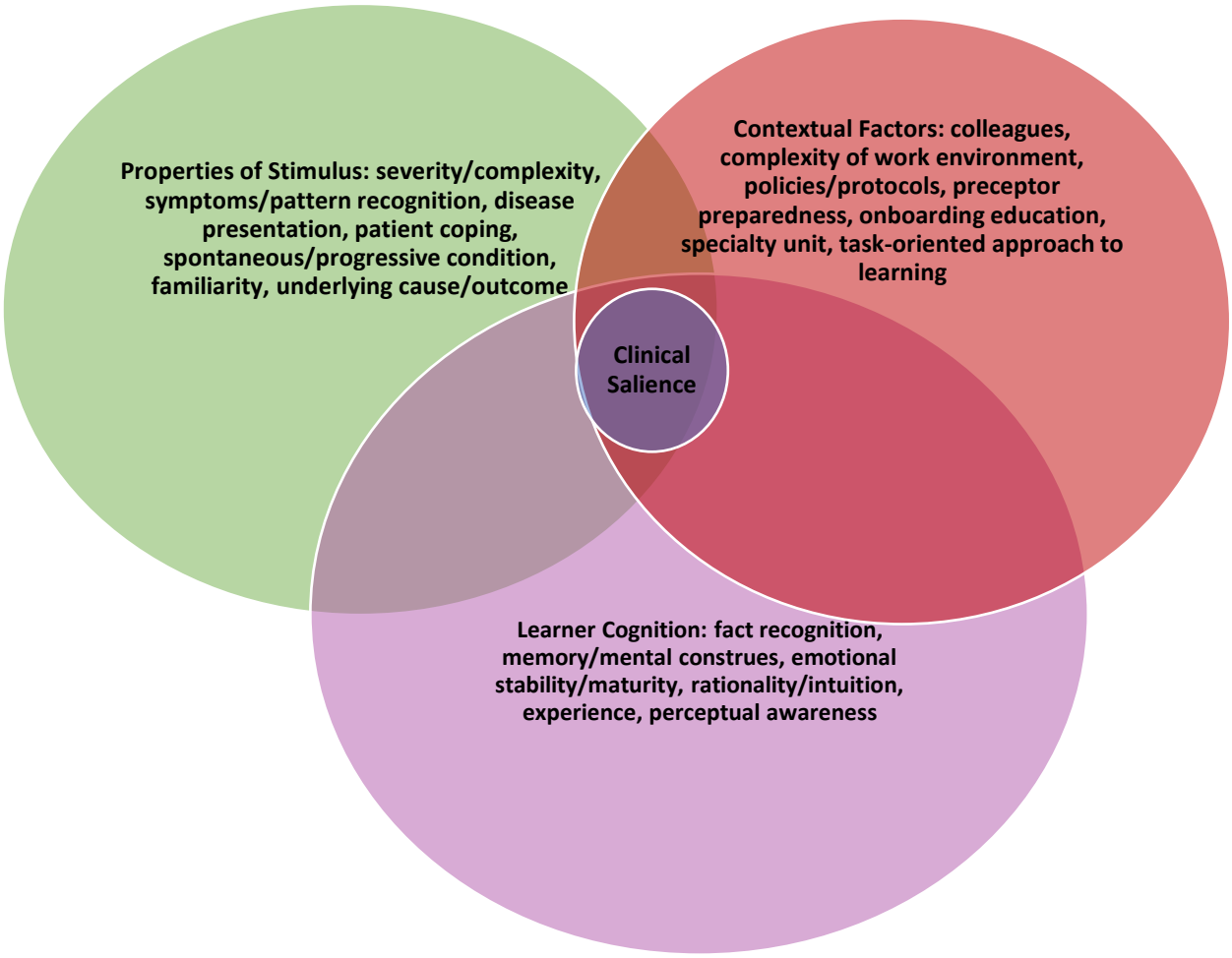
The conceptual understanding of clinical salience among NGNs, as extrapolated from the intersectional and relatedness of the literature review, including all three theoretical frameworks, is summarized below (table 1 and figure 1).

Table 1. Intersectional and relatability of theoretical frameworks on salience development

Elements of Clinical Stimulus	Nurse's Cognitive state	Contextual Factors
Symptom/pattern recognition	Pattern recognition	Nurse colleagues
Severity/complexity	Memory/mental construes	Complexity of work environment
Illness presentation	Emotional stability/maturity	Protocols/policies/standards
Patient coping status	Rationality/Emotionality/intuition	Preceptor preparedness
Spontaneous versus progressive	Isolated versus Simultaneous rationality	Onboarding education
History/familiarity	Experience versus new discoveries	Ward/specialty unit/organizational culture
Underlying cause versus manifested outcome	Perceptual awareness	Task oriented approach to learning

Extrapolated and extracted from the literature review.

Figure 1. Clinical Salience among NGN: A Conceptual Model



The Implications of Clinical Salience for Nursing Practice. The implications for the capacity of NGNs to determine salience in any given clinical context are offered through an analysis of the four previously articulated theoretical perspectives namely Duchscher's (2008) stages of professional role transition, Benner's (1982) model of skill acquisition, Kramer et al.'s (2013) professional practice as complex adaptive systems and Ebright's (2012) human' performance awareness model used to understand salience and clinical reasoning development. Implications for nursing regarding the NGN nursing education, and the healthcare system will be presented next.

Graduate Nurse: Implications of Salience Development. Clinical reasoning and the ability for early detection of changing patient status is conceptualized as a clinical skill which can be taught (Benner et al., 2010; Jessee, 2018; Powers & Herron, 2019) and which has the potential to impact both quality of healthcare and patient safety (Lindfor & Jinttila, 2014). Both Benner (1982) and Ebright's (2012) conceptual models depict clinical reasoning in a complex patient care environment and show how more experienced nurses, by virtue of their familiarity with clinical scenarios and practice experience, employ clinical reasoning and judgment ability. This advanced skill allows them to engage salience using either analytic reasoning, intuitive reasoning, or both simultaneously (Nibbelink & Brewer, 2018; Rohde Domm, 2017). Conversely, NGNs are situated as cognitive novices or advanced beginners on the professional skill development continuum (Benner, 1982, 1984; Duchscher, 2009) which limits their capacity for advanced clinical reasoning due to a lack of experience and subsequent pattern recognition (Benner, 1984; McCatcheon & Pinecombe, 2001). This situatedness reinforces the notion that clinical reasoning abilities are tacitly taught and evolve within the work environment. Recognizing the cognitive, practical, and developmental vulnerability of NGNs entering the workplace is crucial to understanding the supports they require to successfully transition to professional practice (Benner, 1984; Duchscher, 2008). This knowledge should inform which practice areas and what levels of acuity are appropriate for the NGN during the early stages of their transition. To this end, recognizing the capacity of NGNs and adjusting their workload assignments will enable the safe development of their clinical reasoning and judgment abilities. Enhancing the learning of NGNs via apprenticeship opportunities that encourage the development of salience related to patients' clinical presentations is essential. Rather than referring to procedural standards and the completion of common tasks only, NGNs should be

formally supported in the process of sense-making where rationales are shared, and where their thoughts and ideas can both be validated and modified to enhance their learning and recognition ability (Wiering & Greenhalgh, 2015).

Nursing Education: Supporting Salience Development. Support for continual knowledge development is a professional standard and responsibility of all nurses (College of Nurses of Ontario [CNO], 2018). Contextual factors in clinical practice have the potential to both support and hinder nurses' clinical reasoning. Examples include NGNs' interaction with their nurse colleagues, placements in specialty settings, or preceptor-mentor pairing in a teaching-learning dyad (Campbell et al., 2018; Rush et al., 2019). Factors such as regulations, standards, and policies related to how preceptor-mentors perform their teaching and supervisory roles in clinical settings are important in nurse education as they impact on the transfer of intuitive knowledge and sense-making that is inherent in the preceptor-preceptee pairing dynamic (Benner et al., 2009; Daws et al., 2020). Given that clinical reasoning is a teachable skill, the educational preparation of the preceptor or mentor is instrumental in contributing to the development of clinical reasoning for new nurses, especially within a preceptor-preceptee pairing, (Bakon et al., 2018; Rush et al., 2019; Strauss et al., 2016).

In many transition programs, a designated resource person identified synonymously as a preceptor, mentor, or coach is paired with an NGN to support workplace learning (Bakon et al., 2018; Rush et al., 2019; Strauss et al., 2016). Ambiguities in roles and responsibilities have been identified within the preceptor role (Bakon, et al., 2018; McSharry & Lathlean, 2017). Although preceptors do play a crucial role in developing the clinical reasoning of the NGN, evidence suggests preceptors are themselves ill-equipped to teach clinical reasoning skills and lack theoretical understanding to their own practice (Chan et al., 2019; Omansky, 2010; Whitehead et

al., 2013). Therefore, articulating the processes involved in teaching and learning within transition programs will shed light on the preceptor role, how it enhances clinical reasoning patterns among new graduates, and how best preceptors can be supported.

The Healthcare System: Supporting Salience Development. The decision by a nurse to engage in either a rational or intuitive approach to clinical reasoning depends on organizational culture and standards of work, time, the complexity of the clinical scenario, and the extent of manager involvement with what occurs during preceptorship experiences (Bakon et al., 2018; Rohde & Domm, 2017; Strauss, 2016; Voldbjerg et al., 2016). Nurse administrators play an influential role in the experiences of NGNs by their support and development of orientating structures that reflect both the needs of the workplace and an understanding of the stages of transition for new nurses (Bakon et al., 2018; Missen et al., 2015), promotion of positive workplace attitudes, and the development of comprehensive and evidence-informed transition programs (Chant & Westendorf, 2019; Daws et al., 2020). Contextual considerations of healthcare organizations that consider implementing transition programs must include an evaluation of human resource and financial capacity (Chant & Westendorf, 2019; Rush et al., 2019). It is necessary for healthcare organizations and their clinical management teams to recognize the needs of NGNs and actively create supportive learning environments that acknowledge the professional role transition stages. Employers who strategically plan their transition programs are more likely to foster a stable work environment (Africa, 2017). Management teams and administrators need to make clear how the preceptor-mentor relationship will enhance NHNs' overall learning experiences. Emphasis should be placed not solely on descriptions and self-reported perceptions of nurses in preceptor roles, but rather on an exploratory description that clearly shows the nature of teaching in clinical practice

environments and how it contributes to the development of clinical reasoning ability during both knowledge transfer and interaction.

Conclusion. Clinical performance issues and suboptimal patient clinical outcomes have been associated with the quality of clinical decisions of both novice and senior nurses (Benner, 1984; Murray et al., 2017; Purling & King, 2012) The ongoing support of nurses' development of clinical reasoning, therefore, has implications for individual nurses, workplace teams and healthcare organizations. Three theoretical frameworks were examined in this paper that focused on factors that influence nurses' clinical reasoning and decision-making ability in the workplace. Benner (1982) and Ebright's (2012) works considered clinical reasoning experiences of nurses with practice experience, while Duchscher's stages of transition and transition shock constructs, and Benner's progressive skill acquisition framework best inform the understanding of clinical reasoning development among NGNs. An intersection of all frameworks demonstrates challenges for NGNs in operationalizing salience while simultaneously engaging in different reasoning strategies within the context of transition. None of the frameworks described here address the formal processes utilized by NGNs or the nurse preceptors during a teaching-learning pairing. This analysis highlights the need for theoretical frameworks that emphasize contextual involvement with salience and clinical reasoning development among NGNs to mitigate transition experiences and enhance patient safety.

Chapter Three: Methodology

In this chapter, I begin by presenting an overview of the two research cycles that constitute my research design to provide contextual understanding for the rest of the chapter. I include a procedural diagram explaining points of convergence and how the methodological elements of my study came together in each research phase. The sparsity of published research that describes NGNs reasoning processes in clinical settings prompted the use of a mixed method research (MMR) (Clark & Ivankova, 2016) design, an approach that is widely used in social and health sciences disciplines, to provide the breadth and depth of understanding pertaining to NGNs clinical reasoning processes. I speak to the relevance of MMR to understand the complexity of NGN clinical reasoning and decision-making and to frame my study. I then provide details of the study context, recruitment and the quantitative and qualitative data collection instrument used.

The following research questions guided this study:

1) What challenges do NGNs face over the first twelve months of transition into the clinical workplace?
2) What assists NGNs in recognizing patient change?
3) How do NGNs engage clinical reasoning and decision-making?
4) What factors contribute and impede their clinical judgement abilities?

Researcher Positionality.

In this study I am both the researcher who designs the study and interacts with participants, and an experienced nurse educator who identifies with specific beliefs and values. I believe we all

have unique experiences as we go through our world. No two persons experience a phenomenon in the same way, and even one participant's experience is likely to change with repeated exposure to the same experience. These belief systems are rooted in my personal and professional experiences as a nurse educator and prompt me to seek out the various ways new graduate nurses resolve clinical problems. Capturing multiple perspectives of clinical reasoning patterns from the lens of the newly graduated nurse is likely to result in a more comprehensive description of factors that impact decision-making in the workplace. In the same manner, my ontological position of constructivism posits that knowledge emerges from multiple realities represented by the different participants, rather than being anchored in an ideal form (Davis, 2004). Multiple realities were captured in the study through a thematic analysis of how participants navigate decision-making (Creswell, 2013). Also, by presenting a literature review on clinical decision-making and judgement, multiple realities about new nurse hires will also be presented throughout this research to inform the proposal of guidelines and of best practices that promote the development of clinical decision-making and judgement in clinical practice areas.

Overview of the Research Process

In this study, two concurrent quantitative-qualitative strands of data collection were implemented in two consecutive cycles. The first strand comprises a questionnaire sent out electronically to all new graduate hires of participating hospitals to explore the clinical reasoning of NGNs across their transition to the workplace. Data from the questionnaire exclusively addressed research question #1. Concurrently, real-life clinical scenarios with exploratory open-ended questions were used with a sample of NGNs to obtain further insights into the decision-making processes. (Data from the scenarios addresses research question 1, 2, 3 and 4). This approach allowed for a broad understanding of clinical reasoning dynamics that influence NGNs

within the workplace. These two strands were conducted initially at 3-4 months (Cycle One) and repeated at 11-12 months (Cycle Two).

The purpose of Cycle One was to determine the extent to which new graduate nurses (NGNs) identify challenges related to their new role, relationships, knowledge, and responsibilities as practicing nurses within three-to four months of taking up their positions. Given NGNs undergo transition shock as they enter the workforce, the extent to which its impact influences NGNs ability to engage in clinical reasoning and judgement is unknown. To this end, Duchscher's Professional Role Transition Risk Assessment Instrument (PRT-RAI) questionnaire was administered electronically to NGNs who have been working for three to four months at the participating hospital (appendix C). The PRT-RAI is an itemized quantitative questionnaire based on Duchscher's (2008) transition shock theory. This questionnaire enabled me to identify the levels and influence of transition shock on NGN's clinical reasoning and clinical decision-making. The PRT-RAI comprises 61-items measuring influences of transition shock on the decision-making, clinical reasoning and judgement, knowledge, confidence, and job satisfaction of the NGN during professional role transition. The respective dimensions of the PRT-RAI include responsibilities (RS-13 items), roles (RO-12 items), relationships (RL-22 items), and knowledge (KN-14 items). See appendix B for a copy of the PRT-RAI questionnaire. The questionnaire included an item inviting NGNs to participate in one-on-one interviews to further examine their clinical reasoning and judgement.

The qualitative strand of cycle one (repeated in cycle two) comprised an in-depth examination of the clinical reasoning and judgement of a small group (N=13) of NGNs who have been working for three to four months using clinical case scenarios developed from real life situations experienced within clinical care contexts. Case-based clinical scenarios were used to

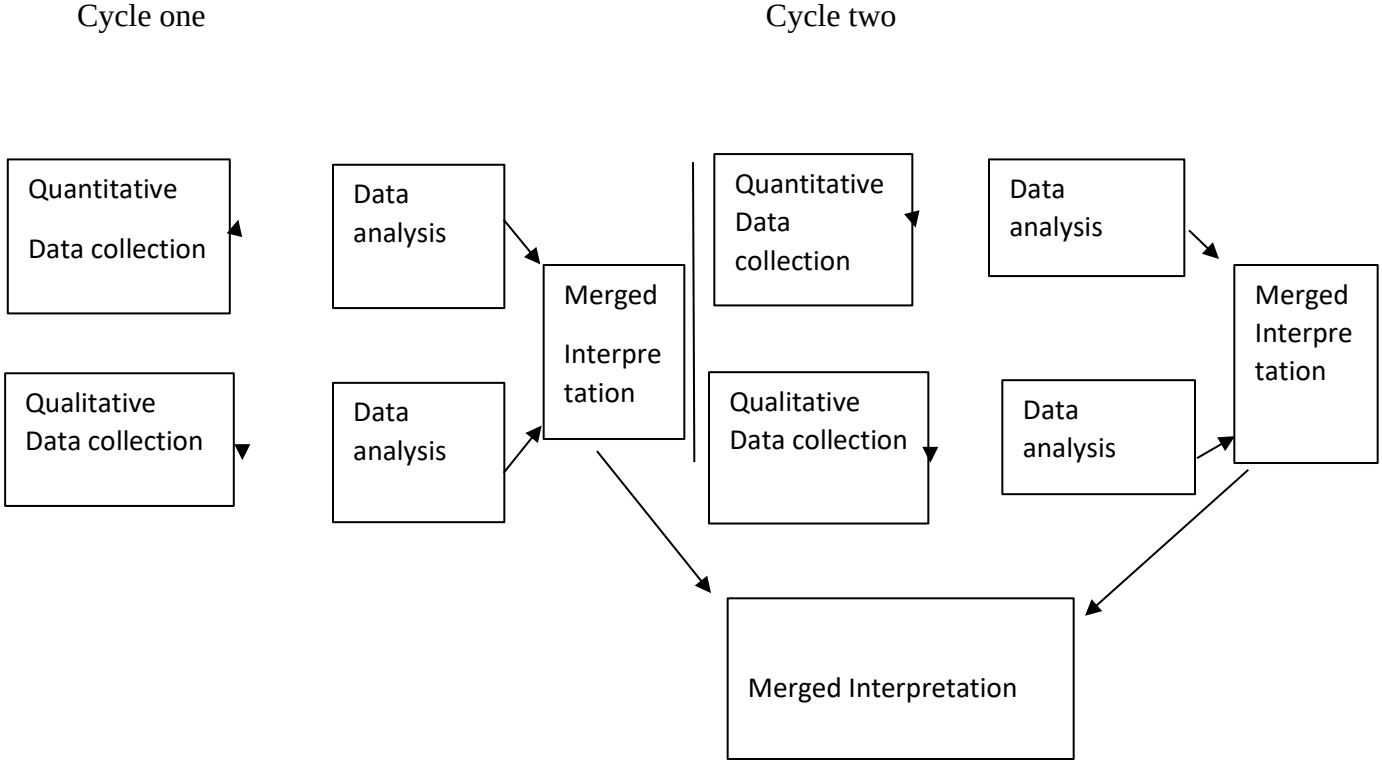
elicit the NGNs clinical reasoning and judgment (Nielson, 2009; Schmidt & Mamede, 2015). Two evolving clinical scenarios were used as the focus of one-to-one interviews to encourage NGNs to speak to how they would engage in clinical reasoning and decision-making. See appendix D for sample case scenario.

These two strands (the PRT-RAI questionnaire and the discussions based on clinical scenarios), were repeated with the same participants at 11 to12 months of work experience. Cycle One survey respondents were sent the PRT-RAI to complete. Again, an invite was sent electronically to the participants of the cycle one interviews who were invited to an in-depth conversation about the same clinical scenario used in phase one. Repeating the two strands using the same research instruments enabled me to identify how the participants responses to the elements of transition shock, as revealed through the PRT-RAI are related to the participating NGNs capacity for decision making and clinical reasoning as evidenced through their responses to the scenarios and how these evolve over time .

Findings from cycle one and cycle two were analyzed separately and then against each other to shed light on the challenges faced by NGNs, how and why NGNs make decisions and the factors that influence the reasoning these nurses make within clinical contexts (Clark & Ivankova, 2016). Factors that influence how they engaged in clinical reasoning and judgement at the two different times were explored.

Figure 2

The Research Process Depicted Below



Significance of Mixed Research Design

Mixed Method Research (MMR) is defined as "a process of research when researchers integrate quantitative methods of data collection and analysis and qualitative methods of data collection and analysis to understand a research problem" (Clark & Ivankova, 2016, pp. 59). My rationale for using MMR is due to its pragmatic means of access to philosophical and experiential realities about a phenomenon (Clark & Ivankova, 2016; Green, 2007), in this case, nurses' clinical judgment in the workplace. In addition to the mixing of data collection methods to provide a broad understanding of the research question, MMR allowed me to identify new graduate nurses' philosophical assumptions and beliefs and its influence on the clinical reasoning

and judgment processes (Green, 2007). Combining two research methods in one research design helps broaden the research scope allowing for enhanced explanation about NGN clinical reasoning capacity in their first year of practice in a holistic way (Morse, 2003). A central tenet of the MMR approach is an integration at either the point of methods, methodology, philosophy, or community of practice (Clark & Ivankova, 2016), therefore the use of MMR design is a good fit as a method of inquiry.

Another benefit of MMR is the ability to overcome the weaknesses of a single research method (Johnson & Onwuegbuzie, 2004). Creswell and Plano Cark (2018) similarly suggest quantitative methods overcome the influence of researcher biases of qualitative methods; likewise, qualitative methods make up for the lack of context with quantitative methods. The use of PRT-RAI survey and semi-structured interviews discussing the clinical scenarios captures different perspectives about NGN's clinical reasoning and judgement to provide a complete picture about their decision-making abilities.

In addition to pairing and mixing of the quantitative and qualitative methods, Sale et al. (2002) suggest the benefits of gaining a holistic insight when using MMR is that single methods may not address research questions in the same manner. Yet through MMR, the phenomena of NGN clinical reasoning and decision-making can be understood holistically in its totality while respecting paradigmatic differences of each method to obtain a multidimensional perspective of NGN reasoning and decision-making processes (Sale et al., 2002)

Study Setting

The study was conducted in a major metropolitan hospital in the province of Ontario providing a large potential sample of nurses for this study. Participants from cycles one and two were recruited from the two campuses of the city's largest acute care hospital. The decision to

recruit from these two hospital campuses was based on convenience of access and to maintain a homogenous participant group (e.g., with similar provincial licensing legislation for nurses in Ontario).

Participant Recruitment and Data Collection

Upon approval by the University of Ottawa Research Ethics Board, participants were recruited through the nursing professional practice office and by way of the researcher's personal and professional networks involving nurses and nurse educator colleagues. Key recruitment strategies involved word of mouth and the distribution of an email message and recruitment poster that were posted on notice boards in staff lounges located in the respective work units. The PRT-RAI questionnaire was circulated electronically through the nursing professional practice office to all NGNs (approximately 200) along with an information letter fully describing the study. Purposive sampling was used to guide recruitment of study participants who were within the three to four months of their positions. Participants were also recruited through snowball sampling, a technique described by Marshall and Rossman (2006) as "identified cases of interest from people who know people who know people who know what case information are rich" (Marshall & Rossman, 2006, pp. 71).

English-speaking, newly graduated nurses with at least 3-4 months of work experience were invited to complete the online questionnaire which took 10-15 minutes to complete. At the end of the questionnaire, participants were invited to indicate their interest in participating in a semi-structured discussion of two clinical scenario pertaining to their area of work; and their interest to be invited in phase two of data collection at eleven to twelve months of work experience. At 11-12 months (cycle two), the PRT-RAI instrument was again distributed

electronically to NGNs who had participated on the cycle one and had indicated their interest to be contacted for the second cycle of data collection.

Nurses who completed the questionnaire and who expressed interest in participating in the qualitative discussions were invited to one-to-one interviews that focused on the clinical case scenarios. Data was collected from thirteen (13) participants. The semi-structured one-to-one interviews, conducted with participating NGNs at 3-4 months, comprised open-ended questions based on two clinical scenarios. At 11-12 months, participants who had indicated interest in participating in phase two of the clinical scenario semi-structured interviews were invited to meet. The same clinical scenarios as cycle one were used as a focus of the interview. Interviews lasted approximately one hour at a time convenient for each participant and as conducted virtually through recognized platforms such as Microsoft teams.

Data Analysis. Study data was analyzed sequentially, first the quantitative data, then qualitative data. Mayoh et al. (2012) sequential procedural diagram was adopted to organize my data collection and analysis process (see figure 2 above). Cycle two interviews enabled me to explore, in a more focused way, how each NGN understood and explained differential responses to the clinical case scenarios at 3-4 months and at 11-12 months (cycle one and cycle two respectively). A state of positionality was sustained through bracketing (Lopez & Willis, 2004) by continually journaling my activities throughout the research process to bring into abeyance my preconceived opinions, knowledge, and biases about nurses in transition.

Data from the questionnaire were analyzed with guidance from my thesis supervisors and committee members with experience in conducting mixed methodology research. Research Pubs, a quantitative analysis software was used to calculate descriptive survey items (averages and

frequency). Differences between the Cycle One and Cycle Two responses were identified, and inferences made (Chou et al., 2009).

All interviews were transcribed and identified with codes so that the three to four month and eleven to twelve months interviews of cycle one and two can be linked for each participant. Thematic analysis informed by a Wojnar & Swanson's (2007) descriptive phenomenological lens was used to uncover the essences of NGNs clinical reasoning and judgment upon entering the workforce. Data was analyzed sequentially, first the quantitative then qualitative data. I read and re-read each transcript multiple times while listening to the audio recordings simultaneously to identify meaning, patterns and pattern matching, explanation building and analysis to obtain an understanding of nurses' clinical reasoning processes (Patton, 2002). Field notes were taken to capture themes that became apparent as the interviews were completed, e.g. non-verbal cues expressed by the participants, new ideas, thoughts, and questions that arose. In addition, I kept a personal journal to record details of my feelings and thoughts throughout the research process. Maintaining a journal record served as an audit trail that ensured the trustworthiness of the data. A state of transcendence, which is described by Lopez and Willis (2004) as being neutral, was sustained through bracketing by continual journaling activities throughout the research process to bring into abeyance my preconceived opinions, knowledge, and biases about NGNs clinical decision-making ability. Furthermore, rigorous bracketing enabled me to remain receptive to the data collected and their meanings. Upon completion of each interview, I critically reflected on the interview responses, extensively reviewed my transcripts, field notes, and journal entries to expose "what was said," "what I heard," and "its meaning;" enabling me to keep track of major themes and vital non-verbal cues. Coded statements were categorized into major themes. NVivo, a recognized qualitative software, was used to manage and organize the transcription data and

themes. A mix of deductive and inductive coding ensured that key ideas were not missed. I met regularly with my thesis committee members, who have expertise in qualitative data analysis, to review accuracy of coding and my analysis techniques.

The essence of the clinical case scenarios is to examine NGNs' reasoning abilities in differentiating, describing, comparing, eliminating, or evaluating to arrive at an action or decisions (Kumar et al., 2019). In an attempt to maintain neutrality during data analysis through bracketing, findings were emailed to participants for their validation and to ensure accuracy of researcher analysis of responses (Lopez & Willis, 2004). It also enabled me to attain descriptive validity with the participants through member-checking (LeVasseur, 2003), and to further the analysis of the findings.

Methods to Ensure Rigor. To establish credibility of these findings and overall rigor of the research process, the following steps proposed by Lincoln and Guba (1990) were undertaken. These authors proposed that qualitative research design should ensure that the quality of the data and findings are grounded in terms of their true value, consistency, neutrality, and applicability. Lincoln and Guba use the concepts of credibility, transferability, dependability, and confirmability as the strategies for evaluating rigor in qualitative research. Each concept is described, with examples of measures taken in the study.

Credibility. Marshall and Rossman (2006) propose that the initial goal to ensure credibility is to demonstrate that the study was designed in such a way that the participants were identified and described appropriately. This was done by observing the parameters of the study, including the inclusion and exclusion criteria and by identification of the limitations of the study. Maintaining and the synthesizing of data from multiple sources and methods enhance credibility (Creswell, 2007), I dedicated adequate time to immerse myself in the data through reading and re-reading

each transcript. I used triangulation (i.e., multiple sources of data) to inform my analysis, which included my personal journal notes, interview transcripts, observation during interviews, as well as the existing literature on IENs to determine the consistency of my findings. I conducted member checking, by taking the general themes from my analysis back to the participants to validate my analysis, interpretation, and description of their responses, and to confirm these themes represented their account of meaning of their clinical reasoning experiences in the first year of professional practice. Participants generally confirmed that the themes I described during the follow-up discussions echoed their experiences. As well, Patton (2002) suggests performing a peer debriefing of research with other researchers in order to ensure the integrity of research skills and methodology. To this end, I had regular debriefings with key informants like my thesis supervisors and committee members, whose expertise in conducting research and in the issues of nurse transition would allow for an invaluable input on the research process, my interview transcripts and thesis chapters. This provided the opportunity for me to gain new insights, which improved my analytical skills as the research process evolved. To continue with bracketing techniques, I maintained a reflective journal which included my biases, values, and attitudes of my analysis as they evolved – a procedure recommended by Lincoln and Guba (1990) as necessary to keep the participants' narratives and interpretations relevant to mine. Keeping a personal journal of my thoughts, feelings, and reactions assisted me in documenting my personal growth as a researcher, as well as the evolution of the research process. For example, I documented my intuitions and decisions made throughout the research process.

Transferability. Transferability is the second concept for evaluating trustworthiness and this refers to the applicability of study findings to other contexts (Lincoln & Guba, 1990). "The burden of demonstrating that a set of findings applies to another context rests more with the researcher who would make that transfer than with the original researcher" (Marshall & Rossman, 2006, pp. 201-2). As a researcher using a naturalist paradigm, I attempted to capture in detail the research process and actions taken as well as the rationale for actions in audit trails. This will make it possible for other researchers to follow the steps taken in my study thus facilitating transferability. Additionally, the use of theoretical guidance with participant selection, such as Benner's (1982) model of skill acquisition and Duchscher's (2008) stages of transition and transition shock framework, the same new graduate selection procedure informed participant recruitment; as a result, theories about transition would be the scope to which generalization can occur. Also, using rich, thick description, I illustrated in detail the participants or setting under study, allowing readers to make decisions regarding transferability (Creswell, 2007).

Furthermore, I enhanced transferability by ensuring maximum variation amongst study participants. For example, I recruited NGNs from different practice settings, as well as of various ages. By having a documented account of my sampling strategy and data analysis, other researchers and users will be able to determine transferability to other contexts. Additionally, to facilitate triangulation, this study employed multiple informants, in-depth interviews, field notes, follow-up discussions (member-checks), and journaling as sources of data collection. I used field notes and a reflective journal to capture my thoughts and observations such as body language and non-verbal observations not captured on the transcripts. General observations I made, which were not captured on tape, were the facial expressions of sadness displayed as they recalled their

integration experiences or happiness when they talked about positive contributions to the nursing team.

***Dependability*.** Dependability refers to consistency and appropriateness of the research process that will enable researchers to understand and attribute variations in realities to the source, a process described by Guba (1981) as, "trackable variance" (p. 81). Qualitative studies by nature cannot be replicated because the real world is constantly being constructed (Marshall & Rossman, 2006). As research themes are categorized as the study progressed, I watched more closely for these themes in subsequent interviews. Data dependability was attained in the data collection by adhering to MMR procedural map to enhance reliability of the research actions. Confirmability that research findings are rooted in the data was supported by making inferences during data analysis which consists of pattern matching and explanation building. My reflective journal served as an audit trail that consisted of detailed documentation of the research processes, as well as decisions involved in analyzing and generating descriptions of NGNs clinical reasoning. This record facilitated the judging of the quality of the research findings by an independent reviewer (Marshall & Rossman, 2006; Patton, 2002). To gain trust, I began my interaction with each participant by introducing myself as a nurse educator and explained the purpose of my research and why I chose to study this phenomenon. I was watchful for visual cues of discomfort and acknowledged when they were observed, particularly in instances where NGNs declined consent to be involved in cycle two of the study. All participants were informed that they did not have to answer a particular question if they found it uncomfortable and also that they could withdraw as a participant at any time.

Confirmability. The final concept described by Lincoln and Guba (1990) is confirmability, which refers to the "neutrality" of the data whereby the interpretations and research findings are rooted in the data generated. This was done by asking an external source to examine my inferences for logic (Marshall & Rossman, 2006). Credibility was enhanced through attending to construct validity and by drawing on multiple sources of data evidence (participant interviews, observation, documentation, surveys) as well as establishing a chain of evidence. Also, I disseminated this study to my thesis committee members and my thesis supervisor giving them an opportunity to ask critical questions and provide constructive critique to my analysis, research methods, meanings, and descriptions generated (Creswell, 2007). Lincoln and Guba (1990) further suggest that neutrality is achieved when the credibility, transferability, and dependability of findings are met satisfactorily. I ensured that the mentioned steps were met throughout the study.

Chapter Four: Findings.

This research sought to examine how new graduate nurses (NGNs) engage in clinical reasoning and decision-making, what factors contribute or impede their clinical judgment abilities, what assists their recognition of patient status change, and the challenges they face in the early and later months of clinical practice. Cycle 1 (C1) encompasses NGNs at 3-4 months of practice and Cycle 2 (C2) consists of NGNs at 11-12 months of practice. Data was concurrently collected and analyzed through an itemized survey instrument based on Duchscher's (2009) transition shock theory as well as from semi-structured interviews with NGNs Duchscher's (2009) transition shock theory outlines and describes the various components that influence the transition of NGNs into the professional nurse role. Specifically, the survey instrument seeks to address research question #1 by determining the extent to which NGNs identify challenges related to their roles, relationships, responsibilities, and knowledge. The professional role transition risk assessment instrument (PRT-RAI) enabled me to identify how the elements of transition shock were revealed in the NGNs' capacity for decision-making and clinical judgment in a complementary way. Clinical scenarios were created from medicine-surgical, neurology, intensive care unit, vascular-trauma, and radiology-oncology units and served as a basis for the interviews with 13 NGNs in C1 and seven in C2. Findings from the survey responses (data addressing research question #1) will be presented first followed by the clinical scenario responses of the qualitative strand which provide data to answer research questions 1, 2, 3, and 4.

Survey Participants

A total of 53 NGNs responded to the on-line questionnaire in C1 and 35 in C2. The majority of NGNs occupied full-time positions, were females, fell within the age group of 20-30,

and represented diverse work specialties. See Table 2 for the representation of socio-demographic characteristics.

Table 2: Socio-Demographic Characteristics:

	C1 Total (N=53)	C2 Total (N=35)
	Employment status	
Full time	30 (56.6%)	24 (68.6%)
Part time	22 (41.5%)	11 (31.4%)
Casual	1 (1.9%)	0 (0%)
	Gender	
Man	2 (3.8%)	1 (2.9%)
Woman	50 (94.3%)	33 (94.3%)
Non-Binary	1 (1.9%)	1 (2.9%)
	Specialty of work (work area)	
Medicine	25 (47.2%)	13 (37.1%)
Surgery	12 (22.6%)	7 (20.0%)
Vascular/Trauma	3 (5.7%)	3 (8.6%)
Other	13 (24.5%)	12 (34.3%)
	Age group	
20-30	43 (81.1%)	28 (80.0%)
30-40	7 (13.2%)	6 (17.1%)
40-50	3 (5.7%)	1 (2.9%)
	Ethnicity	
Arab	3 (5.7%)	1(2.9%)
Black	4 (7.5%)	3 (8.8%)
Chinese	4 (7.5%)	3 (8.8%)
Filipino	5 (9.4%)	3 (8.8%)
South/southern/West Asia	8 (15.1%)	6 (17.6%)
White	29 (54.7%)	18 (52.9%)

Duchscher's (2009) transition shock theory outlines and describes the four components that influence the transition of NGNs into the professional nurse role. Specifically, the professional role transition risk assessment instrument (PRT-RAI) outlines the responsibilities, roles, relationships, and knowledge application variables inherent in the initial transition to practice. The following sections report findings from the PRT-RAI that address research question #1 organized according to the four components in an attempt to demonstrate the extent to which NGNs' identify with these challenges when transitioning to the professional nurse role.

RQ#1. What challenges do NGN face over the first twelve months of transition into the clinical workplace?

Responsibilities

This component broadly describes practice responsibilities of the nurse which include their involvement with disciplines involved in the patient's circle of care, their families and social responsibilities required of them as nurses.

C1: NGNs reported that they understood and were clear about expectations of their practice responsibilities at their various units, yet areas of uncertainty pertained to the performance of these responsibilities, and thus they exhibited novice nurse attributes (Benner, 1982). Specifically, with 3-4 months of experience, their responses to the PRT-RAI showed an underdeveloped level of practice confidence exemplified in their struggles speaking with physicians and consulting with other disciplinary teams involved in the patients' circle of care. Many also lacked confidence in their own decision-making. Even though over 90% of NGNs claimed to understand their general responsibilities and found them to be clear, 9.4% had low levels of confidence and even more (20.8%) indicated they felt unsure about their ability to

practice independently. Further, 35.8% of total respondents felt unsure about the clinical judgments and decisions they made. Additionally, approximately 20% (10 NGNs) were either not confident or feeling uncertain about calling physicians and 40% were not confident or uncertain about consulting other disciplines. And 56.6% of respondents had already considered leaving their current places of work. (See Appendix A for the responsibility response table). These responses suggest a strong lack of confidence as NGNs enter the professional nurse role and a degree of uncertainty with particular responsibilities as nurses. Even though the majority of respondents indicated they were confident with independent practice and with performing clinical tasks as part of their professional responsibility (n=37), the remainder of respondents were uncertain or disagreed. It is unclear if the respondents who questioned their confidence performed the required responsibility tasks out of understanding or insight, or routinely performed because they expected them to. Given their uncertainty, it was equally unclear whether or not the graduates understood the role and scope of involvement they could receive from the care coordinators they worked with. For example, there was a tension in the responses provided by the NGNs in that while over 90% report they understood and were clear about their responsibilities, only 58% were confident in the responsibility to consult other disciplinary teams and 34% were uncertain about their decisions. Thus, while the NGNs understood what the responsibilities were, they generally lacked confidence or were uncertain about undertaking these in practice.

C2: In the later months of practice, NGNs felt more confident practicing independently, they understood their professional responsibilities, had developed confidence in their work abilities and were comfortable communicating with other teams involved in the patient's circle of care, including the physician teams or clerks. For example, 94.2% of respondents understood

their nursing responsibilities and 100% were confident speaking with the charge nurses and nurse coordinators and working with other disciplines involved in the patient's care. At 11-12 months of practice, only 14.3% of the NGN respondents felt uncertain about consulting other disciplinary team members involved in the patient's circle of care. Yet even with increased comfort level with their responsibilities, 80% of total respondents had considered leaving their units of work and 11.4% reported that they felt unsure about leaving their units of work. The majority (61.8%) of NGNs in cycle 2 felt a connection with their community of nurses and 61.8% took part in the social culture and activities at their respective units of work. However, interestingly, respondent's participation in the unit's social activities in Cycle Two had declined from the reported value at 3-4 months (Cycle One). Additionally, in terms of work-life balance, more respondents at 11-12 months of practice were able to mentally disconnect from work on their off-work days than at the 3-4 month period of time. In Cycle Two 68.6% thought about work on their off-work days compared to 79.2% of the respondents at 3-4 months. Further to the growth experienced in the latter months of the transition period, 85% of total respondents at cycle 2 reported having confidence working independently, while their uncertainty in providing care to family members and loved ones increased slightly 31.4% continued to feel unsure in their abilities despite additional months of practice experience.

Overall, with more practice experience, NGNs reported a deeper understanding of their nursing responsibilities. Fewer respondents at 11 – 12 months reported lacking confidence with independent practice. With practice experience, more respondents had increased confidence levels with care aspects that required coordinating patient care with others such as consulting or working with other disciplinary teams involved in the patient's circle of care. Despite growing confidence, more respondents at 11-12 months of practice considered leaving their units of work,

were less involved in unit social activities and managed their work-life balance by mentally disconnecting from work on their off-work days than in the earlier months. The survey did not inquire if intentions to leave their units of work related to professional development or workplace dissatisfaction. Given that both groups demonstrated some level of uncertainty with aspects of nursing responsibilities in the workplace suggests the need for continual support even at 12-months of professional practice.

Roles

The role component of the transition framework pertains to NGNs' ability to carry out specific tasks and to how they are perceived by the care team. Unlike responsibilities that describe the broad duties involved as nurses, roles refer to the performance of specific activities or acts. For example, it is the nurse's responsibility to involve specific care teams with certain patient scenarios (social workers or discharge coordinator) but the role pertains to the act of involving them and seek out their consultation (i.e., consultation with the social worker or transition coordinator).

C1: Uncertainty about the role of a professional nurse was a consistent feature from C1 NGNs. At this early stage (3-4 months) of practice, the NGNs in this study faced reality about the professional nurse role and the duties involved. This was evident in the NGNs questioning of their decisions to become nurses (54.7%) and feeling unsure about what was expected of them in carrying out their nursing tasks. While a smaller percentage (28%) found that the nursing role was not as they expected, they still felt unsure about what others expected from them. The majority of C1 respondents understood the extent and scope of practice required of them as nurses as distinct from other disciplines and support teams. For example, 84.7% of total respondents understood the difference between the nurse's role from that of a clerk and 94.3%

understood their role compared to unlicensed health care workers. Responses varied in terms of leadership, respect, and work-life balance. With respect to respondents' readiness to execute leadership duties that accompany their nursing role, 20.8% felt comfortable taking on leadership roles, 28.3% did not feel comfortable and 47% felt uncertain. (See Appendix A).

While the majority of C1 respondents reported being able to manage work-life balance, nearly half had reservations about nursing. In these early months, 54.7% of respondents felt the nursing role was as expected while 15.1% felt the nursing role wasn't as they expected and 30.2% were uncertain about their expectation of the professional role. This early group reported that the transition from student to nurse role was not as they had anticipated in that 28.5% of total respondents felt the student-to-nurse transition was more difficult than they expected, and 32.1% reported being unsure about their expectations related to their transition from student to professional nurse role, suggesting that preparation for their transition experience during their undergraduate education is suboptimal and may impact on the professional role transition shock experienced in the early months of practice.

C2: NGNs' with 11-12-months of practice understood the expectations of their role as nurses and could distinguish the nursing role from that of other disciplines or support care team members. Interestingly, uncertainties about their professional roles persisted into the later months of practice. Responses show that respondents had increased understanding of their role as new graduates and how it differs from that of an experienced nurse, however considerable uncertainties remained. For instance, even though the majority of respondents understood the difference between their role as new grads and that of their nurse colleagues, 17.1% were unsure and 8.6% did not understand the difference between their role and new grads from that of their nurse colleagues. Additionally, while 91% understood what others expected of them, 74.3%

continued to question their decision to become nurses compared to C1 respondent's where 54.7% questioned their decision to become nurses. These findings suggest a dissatisfaction with their professional decisions that increases as their familiarity with practice evolves.

NGNs' with more practice experience continued to encounter new aspects of the professional nurse role including being expected to take on leadership roles in the workplace. Within the C2 group 37% agreed to taking on a leadership role in the workplace, while 20% did not take on leadership roles and 40% felt uncertain about their ability to take on a leadership role at their places of work. While the majority of C2 NGNs felt respected by the support staff and teams involved in the circle of care, 17% still voiced uncertainty about the level of respect received from their colleagues and 8.6% did not feel respected. Similar varied responses were reported with the level of respect the NGNs felt from physicians with 62% feeling respected, 25% felt uncertain and 11.5% determined that they were not respected by the physicians they worked with. As alluded to above, 37% C2 NGNs felt the professional nurse role matched their expectations of the role they had prior to coming into practice, while 28.6%% continued to feel a disconnect and 34.3% continued to feel uncertain about being a nurse. Although the transition shock was still present at the latter stages of their professional role transition, it appeared to lessen with time with 45.7% agreeing that the move from student to nurse was more difficult than expected, 31.4% felt the transition wasn't as difficult as they had anticipated and 20% remained uncertain. It was somewhat concerning to find that 42.9% of C2 respondents felt they could not manage their work-life balance effectively, 37.1% were uncertain and a modest 20% reported being unable to manage work-life balance effectively.

In summary, C2 NGNs, for the most part, had developed a higher level of comfort and confidence in their roles as nurses. They had a deeper understanding of responsibilities

associated with the professional nurse role and they felt respected by most of the professional teams they worked with. Uncertainties persisted related to taking on leadership roles, striving for an effective work-life balance and feeling respected by their colleagues and other members of the care team. At close to one year of practice some NGNs continued to have lingering sentiments about their decision to become a nurse.

Relationships. This section describes NGNs findings of their work relationships with other team members including the nursing administration team on their units.

C1: Similar to the NGNs' perceptions of their roles and responsibilities of being a professional nurse, uncertainty was a recurring feature with respect to workplace relationships. Respondents reported that while most units supported NGNs during their transition, they still had a sense of vulnerability in the workplace. Respondents generally felt safe communicating concerns about their personal practice to their nurse colleagues and managers. This said, some experienced difficulties reporting general workplace concerns with 17% of respondents claiming they did not know how to report workplace practice concerns and 30.2% simply feeling uncertain about when and how to report. The vast majority (86.3%) of C1 respondents felt at ease seeking support from their nurse managers or educators, 6.5% still felt unsafe and 12.9% felt uncertain about approaching their nurse managers. Close to a third of the C1 NGNs (30.2%) felt uncertain about their safety reporting professional behavior that concerned them for fear of reprimand, while 9.5% claimed they did not feel safe. Another aspect of professional relationships was the NGNs' perceptions about the level of support they received at their respective units during transition. A small number (3.8%) felt their workplace did not support their transition, 28.3% felt uncertain about performance support and recognition received during their transition, while 7.6% did not respond or felt the question wasn't applicable. Interestingly,

26.4% of respondents later claimed they had experienced bullying at their places of work. The fact that such a significant percentage claimed they were bullied, accompanied by the number of NGNs unsure of the level of support and performance recognition received during their transition is something workplaces might need to consider given the critical period of transition as new grads enter the work environment.

C2: The majority of respondents 11-12 months into their new graduate practice did not believe others saw them as leaders in their units. While 17.2% of C2 respondents felt others saw them as leaders in their respective units, 40% did not believe they were seen as leaders and another 40% were uncertain. It is unclear if their uncertainties resulted from not placing value on their own leadership abilities, a lack of opportunities to enact leadership roles in their workplaces, or simply uncertain about how their colleagues perceived them in terms of their leadership capacity.

With regards to the degree to which the NGNs' perceived that they were accepted by their work colleagues, the level of acceptance varied depending on the work colleagues. While77% felt accepted by their nurse colleagues, 17% felt uncertain and 5.7% did not feel accepted by the nurses they worked with. It is worth noting that there was an increase in NGNs at 12 months who reported feeling uncertain about being accepted (20%) or who did not feel accepted (20%) by the nurses they worked with. This suggests that with increasing professional experience in the workplace, NGNs' felt more uncertain about being accepted by their nurse colleagues. Conversely 65% of C2 NGNs felt accepted by the physicians they worked with while only 28% felt uncertain about this acceptance.

The majority of C2 respondents (74.2%) claimed they knew how to report practice concerns in their places of work but expressed uncertainty associated with their sense of safety

reporting these professional behaviors. With increased experience, fewer respondents reported experiencing bullying behaviors on their units. Almost all respondents (97.1%) claimed that they did not experience bullying directly from their nurse managers, while 14.3% experienced bullying from their care coordinator and 20% experienced bullying from physicians. The 20% of respondents who claimed they were uncertain about whether or not they experienced bullying behavior in the workplace could suggest that they may not fully understand what constitutes workplace bullying and its corresponding behavior.

With respect to their collaborative relationships with colleagues in the workplace, 82% of the C2 respondents felt safe approaching their nurse managers but only 14% felt uncertain about safely approaching their practice leaders (patient care coordinators or charge nurses) and 20% were still uncertain about approaching senior nurse colleagues and mentors. With 11 – 12 months of experience, 77% report being comfortable and confident in their practice and workplace environment, while remaining uncertain about their professional career advancement prospects or their ability to handle leadership responsibilities. Unlike respondents in C1, NGNs' in this group took on leadership responsibilities such as the coordination of patient care involving other disciplinary teams. It is possible that the revealed levels of uncertainty with leadership responsibilities was as a result of being afforded increased professional responsibility, creating feelings of insecurity with, or a lack of acceptance of their leadership skills by themselves and others. In addition, at C2, while 34% now reported that their workplaces supported their transition, a surprising 37% remained uncertain about the extent of workplace support they received. Consideration to leaving their units of work persisted for 32.8% of respondents at 11-12 months of practice with another 40% indicating that they were uncertain about staying at their unit of work. In summary, when considered alongside the C1 data it appears that NGNs' at 11-12

months of practice experience claimed a diminishment of relational connection and feelings of acceptance. It is possible that at the 11-12-month mark NGNs start to assume more practice responsibilities as part of their role and are no longer shielded by their NGN status. This could result from an increase in the expectations being placed on them by their colleagues, physician teams and care coordinators, inciting a shift in personal satisfaction at the workplace or perceptions of work-life balance.

Knowledge. The knowledge component of the PRT-RAI describes the NGN's ability to engage with confidence in clinical reasoning and clinical judgement.

C1: Participants at 3-4 months of practice felt their education prepared them theoretically for clinical practice, but their responses revealed a tension between their theoretical knowledge and the clinical practice knowledge application required for safe practice. For instance, while 66% reported that their education prepared them for professional practice, 9.4% did not feel the knowledge learned in school prepared them for the workplace and 22.6% were either uncertain or lacking confidence in performing clinical skills required for the workplace. This suggests that at 3-4 months of experience NGNs may be applying knowledge and performing clinical skills for the first time.

Because NGNs at the early stages of their transition (3-4 months) lacked an understanding of the level of complexity involved in caring for acutely ill patients and had limited exposure to complex scenarios, it was not surprising that they were less confident in their abilities. Over a third of the respondents (39.6%) reported uncertainty or did not feel comfortable handling patient complexity. In addition, few respondents (9.4%) felt confident responding to changing patient conditions and even more (17%) felt unsure about their ability to respond to changing patient conditions. While it is unknown why participants from C1 choose to not

respond to certain questionnaire items about their confidence responding to changing patient conditions it may signal uncertainties around their practice. In terms of the NGNs' knowledge of professional role transition as a concept and its impact on the NGNs introduction to practice, there was a relatively even split; 43.4% of NGNs understood the meaning of transition shock, 32.1% did not understand its meaning and 17% were uncertain. Interestingly, over half (51.6%) understood the stages of transition, while 15.1% had no understanding and 26.4% were uncertain. This suggests that the concept of transition shock is poorly understood by NGNs entering practice.

C2: As time went on, NGNs felt more confident about performing the nursing skills required of them and they seemed to have developed a deeper knowledge and understanding about care complexities and responsibilities associated with patient care. By the time they reached 11-12 months, 62% of total respondents felt their educational foundations prepared them for professional practice, 20% did not and another 17% continued to feel uncertain.

At this latter stage of their transition, 68% NGNs were confident caring for complex patients while 28.6% continued to feel uncertain. Uncertainties persisted with respect to responding to changing patient clinical status (14.3% felt uncertain) and their ability to think critically (14.3% felt uncertain). Overall, by C2 respondents felt an increase in their ability to think critically and felt they had the practice knowledge needed for their work duties. In terms of supporting knowledge development, 61% NGNs at 11-12 months of practice said their workplace invested in their learning and knowledge growth while 26.5% remained uncertain about the support they were receiving and 11.8% reported that they did not receive support for continual learning. Given earlier responses which described their responsibilities suggest more respondents' in C2 intended to move to other units of work and were overwhelmed with

increased professional responsibilities and balancing work and personal demands. It is unclear if educational support offered by the units focused on improving their ability to perform in their units or on other units or professional development in general.

The majority of C2 respondents said their work colleagues and management team placed realistic expectations on their nursing performance: 74.3% of respondents agreed that their nurse colleagues had realistic expectations of them while 67% agreed that managers had realistic expectations of them. Still, 22.9% felt uncertain of their colleagues' expectations, 29.4% were uncertain of their manager's expectations and 23.5% had uncertainties about their practice performance. With regard to their understanding of their transition experience, 54% claimed to understand transition shock, 25% did not understand it, and 20% were uncertain they understood the concept of transition shock. In terms of perceptions about the nursing profession, 40% agreed that their perceptions were an accurate reflection of reality, but almost the same percentage (37.5%) said their perception about the nursing profession was inaccurate. Compared to C1 respondents, the C2 NGNs perceptions of manager expectations declined as practice responsibilities increased. Responses of NGNs at 11-12 months experience suggested that NGNs had a deeper knowledge and understanding of the responsibilities of the professional nurse role but still required support with managing complex patient conditions. NGNs perceptions of their performance as nurses continued to be uncertain for many and resulted in conflicted feelings about the nursing profession even at this late stage in their transition.

Summary of Survey Findings

Overall, findings from C1 and C2 suggest NGNs come into the workforce with an entry-level educational and theoretical knowledge but lack the technical and clinical practice knowledge required of the professional nurse role. Over time, as they gain more experience,

these new practitioners develop a better understanding of the complexities involved with patient care and the professional nurse role. By 11 – 12 months of experience, NGNs have been exposed to a variety of patient acuity levels involving more than one illness condition or symptom occurring simultaneously. This results in these practitioners experiencing more of a practice reality which, for some NGNs creates uncertainty about their performance and abilities. The experience of transition shock remained prominent in work relationships and practice-related situations as revealed by uncertainty for both C1 and C2 NGNs in successfully meeting clinical judgement and decision-making expectations. While confidence with independent practice increased with work experience, a small number continued to struggle with independent work.

Qualitative: NGNs Responses to Clinical Scenarios

As outlined in Chapter 3 the qualitative strand of C1 and C2 comprised an in-depth examination of the clinical reasoning and judgement of a group of NGNs using clinical case scenarios developed from real life situations experienced within clinical care contexts. Two evolving clinical scenarios were used as the focus of one-to-one open-ended exploratory interviews to encourage NGNs in speaking about how they would engage real-life clinical scenarios. Transcriptions of each interview were analyzed to identify meaning, pattern matching, explanation building and analysis to obtain an understanding of NGNs' clinical reasoning processes. Four themes were identified which addressed each research question: 1) knowledge and maturity in the professional role addressed the research question, 2) past clinical education and educational knowledge and/or experience, 3) clinical reasoning and decision-making, 4) knowledge of contextual and institutional procedures, and clinical practice complexity. The coded phrases or words and their frequencies are summarized in Appendices G and H.

What challenges do NGN face over the first twelve months of transition into the clinical workplace?

Level of Knowledge and Maturity in the Professional Role

This theme addressed the first research question about what challenges do NGN face over the first twelve months of transition into the clinical workplace? This theme also provides evidence of participants' levels of knowledge about the patient conditions presented in the clinical case scenarios and their level of maturity enacting their professional nurse role. It speaks to the NGNs' clinical knowledge and relational experiences as part of the nursing role, and the contextual influence of the same on their role as nurses. Specifically, the NGNs' perceived professional immaturity and an under-developed practice knowledge level in addition to the challenges with transitioning into the professional role and how work relationships impacted the NGNs.

NGNs at 3 - 4 months (C1) demonstrated a superficial level of clinical knowledge about the patient's condition which was presented by a limited capacity to identify appropriate next steps in response to most clinical scenarios. Their responses to the patient scenarios at 3-4 months revealed an uncertainty; they were unsure or were not aware of how best to proceed with complex clinical cases even after they were able to identify a clinical cause. An example below illustrates participant struggles with determining an appropriate next step including who to involve in the patient's treatment and care.

> *So, from a treatment perspective, you're going to want to give a little smidge potassium, I can understand she has a lot of questions, so I would explain to her it's a flare up, so she already knows that she has Crohn's seeing she has a history of this before and just really comforting her that her vitals and everything is looking good. And so, just focus on getting her stabilized and then figure out how to further address her Crohn's. Whether anything caused it to flare up, like whether she was stressed. Is she taking her*

> *immunosuppressants, that kind of thing, and then addressing whatever her concerns are and questions that come up. About the CT results, I don't know. I'm not familiar enough with Crohn's to know like if this is like bad or in line with Crohn's and if we need to scale up on things or have a consult with like their dietary or anything like that. Yeah, I don't know.* **(P7 3-4 months).**

Additionally, participants were able to identify occurring factors about the scenario but were unable to determine what factors to address in an order of priority and what clinical presentations were typical for the clinical condition and presenting symptoms. This suggests that at 3-4 months of experience, these practitioners had unfamiliarity and limited capacity to discern the salient cues the data was giving them and to reason through a complex patient scenario.

> *So just looking at this scenario, I would be concerned with the history of hypertension, mostly in the context of AAA repair. So ideally in what I've seen, I wouldn't want a patient to be hypertensive following a AAA repair in the case of a possible rupture. I'd also be concerned about the chronic pain, so I don't know too much about the pain, but considering that he's sedated and intubated, he's not able to tell me where the pain is. He may be having back pain, which I might see during a transperitoneal repair, with some bleeding from the AAA site, so I would be concerned with that as well. Those would be my 2 main concerns. Uhm, I abdominal distention could be because he was infused with just a ton of fluids, tons of crystalloids, tons of red blood cells, so could be that [HTN could be related to this]. But I mean it, it's also an issue.* (**P1 3-4 months**).

A superficial level of clinical knowledge and professional immaturity was also evident by participant's inability to determine an order of priority particularly the scenarios that reflected increased complexity. The example below shows how they struggled with clinical management due to the complex and evolving nature of the scenario.

> *Blood pressures, temperature, Pulse is fine. Vitals seems stable to me, uhm? …. BM is soft but not too soft. It's not on the crazy soft side, that's a lot of bloody BM, so definitely they're going to keep an eye on it. I think it's Crohn's with like crazy amount of bloody BMs, I'm expecting some steroid to be prescribed. I've seen steroid prescribed for patients who have Crohn's. So steroid and I want to say antibiotics because I've seen antibiotics prescribed too but I don't want to, yeah, I want to say that antibiotic. It does seem a lot scary. Hopefully next time I see you, I have better responses, I will be more confident* (**P10, 3-4 months**).

Another transition challenge pertaining to prioritization was experienced by another participant. While able to recognize the patient had several needs, she remained unsure of which need to prioritize.

> *Prioritization, that is a challenge, determining what is important and what not. I know they're not doing well. I know I better treat the other issues first before changing her soiled diaper, but it's still difficult, to this day I would say* (**P2, 3-4 months**).

In addition, their limited clinical practice knowledge and lack of familiarity with contextual practices, influenced their approach to patient care which limited their clinical reasoning ability. The NGNs' lack of knowledge of contextual practices influenced their decision-making and level of advocacy for additional services required in a patient scenario. This was evident in both C1 and C2 based on their work units. With C1, the NGNs with only 3-4 months experience readily acknowledged their own lack of knowledge, particularly in terms of additional care requirements.

> *That's where I find I lack a lot of knowledge in terms of like the continuity of care, what happens at home upon discharge. I feel like that's the ward/floor nurses' sort of thing, they know what happens with discharges* **(P2, 3-4 months**).

C1's limited practice knowledge was evident in their inability to identify the interprofessional teams within the work environment that might be required in response to the scenario. These participants expressed uncertainty about the different interprofessional teams' respective roles and involvement in patient care. One participant says "*I don't know if general surgery would be seeing her or GI, I don't know, like the services overlap because… I guess it wouldn't be. I guess just GI then, so never mind"* (**P10, 3-4 months**).

In contrast, at 11-12 months of clinical practice experience, NGNs showed improvements in their ability to know the next steps involved with the complex clinical scenario and apply an interdisciplinary approach to ensuring patients receive quality care. Responses from C2

demonstrate how the NGNs' extended practice experience (11-12 months) reflected increased knowledge and maturity in the professional nurse role, allowing them to advocate for timely and wholistic interventions on behalf of the patient. Unlike in C1, participants had progressed in their ability to enact the professional nurse role and were able to anticipate potential risk and saliently occurring factors typical to the scenario and requested the necessary tests to monitor the patient's blood values in a systematic way.

> *Yeah, for me it is the desaturation and the pulmonary embolism. So, I would initially be concerned with that cause. As part of my ABC's – airway, breathing circulation. So, let me see, so that would affect his breathing. So that's my B right there. Pulmonary embolism in the right upper lobe. I would want to ensure he is going to be on some kind of anticoagulation if he wasn't initially on anything, I would want to see if there's any kind of consults like possibly thrombosis. See if they're involved in his care at. Maybe you get them involved as a consult if they weren't already following. Review with the team (the attending team), about getting him on anticoagulation, to see if they want to do anything themselves or just consult thrombosis. I'd be monitoring his vitals, keeping a close eye on his oxygen saturation, Respiratory rate as well as blood pressure.*
>
> *So, the other thing that stood out to me was his distended abdomen. So understandably, he had an ileus post op. So, I would want to be listening to his abdomen, auscultating, checking to see if he has bowel sounds. If bowel sounds are returning any kind of tinkling It could be Incision healing, it could be Ileus, he could be backed up. Of course, I'd want to do a bit of a GI review. Is he still NPO? Has he been slowly resuming a diet, is he eating anything at all? Is he on clear fluids, full fluids? But otherwise, I also of course want to check his back, see if he's got any bruising, any kinds of bleeding, any leak, in line with that AAA repair* (**P1 11-12 months**).
>
> *So, they're admitted for Crohn's flare up, pain would be something that I would attend to, whether they have any pain. Then their lab results for blood work. So CBC because there has been bleeding for multiple days, CBC might be good, I would ask the doctor for a CBC blood work up. Doesn't mention anything about their diet, so maybe, see if she's been eating at all, if her diet is poor, maybe get the dietitian involved. There might want to give her bowels a rest, so they might probably want to start PPN [peripheral parenteral nutrition] or TPN [total parenteral nutrition] or something. So yeah, get the dietitian involved I feel like I'm blanking out. Umm, OK. I don't know if she's going to get a colostomy, usually patients with Crohn's kind of end up with it. Yeah, but I don't know if that's jumping the gun.* (**P10, 11-12 months**).

Furthermore, with 11-12 months of experience, NGNs were more comfortable in their knowledge of the next steps involved with the clinical scenario and which interdisciplinary teams

to involve ensuring that patients receive quality care but still had questions about specific practice knowledge.

> *I feel like I would know who to contact if I need certain things. Like I can contact the dietitian for this, but there's certain things I don't know, then there's always the clinical educator I can always ask. And advocating for patients like, speaking with the treatment team that I'm seeing this or that about the patient. Sure, we'll send her home, we're planning to discharge her, but I don't think she is ready yet. I feel like being the patient advocate, I can recognize it easier for patients for the sake of patient safety and all that* **(P10, 11-12 months).**

Another was able to identify that further care was needed, yet was uncertain about specific teams to involve before discharge home, she says,

> *she would need to consult before going home? She may need some rehab. I'm not aware of what sort of outpatient process is needed for this though. I don't have a lot of knowledge for this. I work in a critical care part; we hand them off to the ward care area.* (**P2, 11-12 months**)

At 11-12 months of experience the NGNs exhibited an increased level of knowledge and maturity in the professional nurse role. This allowed them to advocate for timely intervention of care from the appropriate disciplinary teams. There was also evidence of NGNs self-awareness of their changing level of knowledge and how this enabled them to not only seek additional advice but to provide input.

> *Yeah, I would actually say that like during my first three months, I was also new at TOH. So, like I didn't know the consulting teams, I wasn't familiar with what they did like I wouldn't have been able to say back then, I'd want to get the thrombosis team involved or I'd want to maybe get APS involved, but now I'm more familiar with what each of these teams do. I am more willing to work with the newer residents and say, oh, do you mind consulting this team? It could be of benefit to the patient.* So, *yes, I definitely feel a lot better going through them the second time with, like, a year experience now* **(P1, 12 months).**

At 11-12 months of experience, despite increased practice experience, familiarity and more confidence in responding to increasingly complex patient conditions, factors such as workplace relationships, lack of recognition and lack of support adds to the transition stress and

can cause NGNs to consider leaving the profession. Relationships with work colleagues is part of adapting to the professional nurse role and evidence suggests that work inter-relationships affected the NGNs differently at 3-4 months than at 11-12 months of work experience. At C1 (3-4 months) NGN reported how she faced unpleasant experiences working with other nurses on her unit but found reassurance in her own self-belief and her commitment to patients.

> *With bullying, I guess everywhere you go there's always someone right. It's just sad, but it's really still happening, and you know it's hard for a new grad to transition, especially in critical care. I was probably just lucky that I got hired there but they're not very, well some of them are not really very welcoming, especially one nurse told me she's been there for like 25 years … and for her she felt like the program was created and just handed over to us [NGN] easily. So, you know those kinds of comments. But you know, you just have to believe in yourself. That's what I found. Believe in yourself that you could do it. And of course, your patient, I treat them as a family member and do everything in my power for them, that's it. They are surprised that I am actually surviving* (**P8, 3-4 months**)

Meanwhile at C2, transition stressors with work relationships were centered around workplace support and the lack of recognition from their colleagues.

> *It's a little bit too depressing of an environment, to be honest with you. It's not just nursing shortages; I find like the workload is consistently increasing and it's not worth it. The worth of being a nurse is not there anymore for me. I don't want to be in nursing anymore, I'm kind of trying to figure out an exit strategy from the hospital. Well, I could go back to school, but I don't think that staying within the hospital system, even with the masters, will do anything good. So, I'm just kind of going into the beauty industry now, it's a lot 'chiller' and less demanding. I mean, I'll miss the mental challenges [of being a nurse], but the physical aspect of it, not at all. I won't miss that for one minute. There's no recognition either I find especially that I'm part time and I work nights or weekends. I haven't had a high five or a good job from a manager, I would say once, but it's like all the effort that you put in over like let's say a year, like you're kind of hoping that somebody notices me, you know, and says good job. Like I know that's like lame but yeah, they need to say it* **(P2, 11-12 months)**.

In summary, NGNs with 3 - 4 months of experience had difficulty managing and reasoning through complex clinical scenarios and determining the appropriate next steps involved in the patients' scenarios. These difficulties suggest these NGNs have an underdeveloped clinical practice knowledge and exposure. At 3-4 months experience, the effect

of transition shock on these NGNs was exemplified by an underdeveloped knowledge of clinical scenarios and understanding of medical management about the patient problems, as well as uncertainties dealing with the clinical scenario. At 11-12 months of experience, NGNs demonstrated increased knowledge about the clinical cases presented in the scenarios, being able to identify what to do or who to involve in a timely fashion. Rather than a lack of knowledge, those with 11-12 months of experience had succumbed to their transition crisis experience (Duchscher, 2023) mediated by such factors as increased workload and a consistent lack of support leading to feelings of dissatisfaction and burn-out.

RQ#2. What assists NGN in recognizing patient change?

Past educational/clinical knowledge and prior clinical practice.

This theme addresses the second research question that asked what assists NGN in recognizing patient change? The NGNs' past educational and clinical knowledge as well as their prior clinical experiences during their formal education period for C1 participants informed their initial reasoning when faced with each clinical scenario. For C2 participants, prior knowledge and experience afforded them the ability to associate, eliminate, anticipate or attribute significance to a new clinical scenario, which further allowed them to determine an appropriate course of action. This provided insight into how they attributed relevance to the presenting problems within the scenario and revealed the relationship they were drawing between patient conditions or symptoms and the potential patient risks. NGNs consideration of potential risk triggered their ability to recognize the level of complexity of treatment or care. This pattern informed the NGN's clinical reasoning and judgment process.

At 3-4 months of experience the NGNs could identify clinical considerations about how they would approach the scenario presented to them. Their ability to attribute significance was based on their work experience and knowledge which was characterized by uncertainty and a superficial level of reasoning. An example of how they anticipated outstanding occurrences in the clinical problems: "*he may be having back pain which I might see during transperitoneal repair, with some bleeding from the AAA site*" (**P1, 3-4 months**)

Other examples demonstrate how past education enabled them to anticipate safety considerations allowing them to consider what they would need to "watch out for".

> *Big abdominal surgeries, you watch for their urine output, a lot of times the renal clamp time [a surgical procedure that protects the kidneys during long surgical procedures] is often long so the kidneys get affected, usually acute kidney disease with big abdominal surgeries, these are things you have to watch out for* **(P4, 3-4 months)**.
>
> *Is he on any sort of antithrombotic medication? like he developed a pulmonary embolism (PE) in the first place. Also, the mottling and cold extremities and everything like that could be from such high doses of vasopressors [vasoconstrictive medications]. So, have we given him enough fluids so that he can appropriately perfuse.* (**P8, 3-4 months**)

At 3-4 months experience NGNs focused on the presenting symptoms but were not always able to recognize salient factors behind the symptoms and their responses demonstrate this uncertainty.

> *Providing her with antiemetics at mealtimes would probably be of value for her because we don't want to feed her and she immediately throws up the feeds and risks the nasogastric tube (NG tube) coming out* **(P3, 3-4 months)**.
>
> *If there are any global Glasgow coma scale (GCS) [referring to neurologic assessment scale] changes of two or more, for me that's like an automatic call to the surgeon. Because something is wrong, they are having some transient changes, maybe they are not answering questions or are drowsy, that's a big concern for me* (**P2, 3-4 months**).

C1 participants were able to articulate their thinking processes in response to the patient scenario – including asking questions that they felt a need to have clarified or investigated further.

Similarly, this participant considered the influence of past medical history on the scenario:

> *The patient has a history of central venous thrombosis so I would think that she would be on like a blood thinner. Then you have to keep an eye on that because she is also bleeding, and so it would be making sure that you are keeping a balance between the blood thinner that she's on and not making her bleed out* (**P12, 3-4 months**).

The NGNs' past education or clinical experience also influenced how they anticipated appropriate treatment or care and the ability to recognize levels of patient complexity and changes in clinical status; this was often without consideration of the complete picture. One participant described her approach to the scenario (oncology clinical scenario) by isolating a commonly used medication with her subsequent action without considering other occurrences within the scenario:

> *I guess what stands out with him is that he's on Keppra [anti seizure medication] so that's typically an anti-seizure medication, so the patient should probably be put on seizure precautions and should anticipate potential seizures as well* (**P3, 3-4 months**).

With the medical-surgical scenario, one participant anticipated appropriate treatment or care based on past clinical experience with similar situations. She expected that the treatment of the patient's Crohns flare up would include steroid therapy:

> *She should be on some corticosteroids like prednisone, there is also a chance of having high blood sugar because of the prednisone, I would get them to order blood sugar tests* (**P9, 3-4 months**).
>
> *Big abdominal surgeries mess up the insides a little bit, so with distention they can become constipated or a possibility of an ileus, those are the things you have to watch out for. Also, abdominal incisions tend to usually leak a bit more* (**P4, 3-4 months**).

NGNs' past formal education and prior exposure supported their reasoning because they were able to anticipate possible management strategies.

> *pt. is coming in with fever, with low white blood cell count he would be at risk for febrile neutropenia and there is a risk of septic shock. With the risk of septic shock, you would start them on a prophylactic antibiotic while you're waiting for blood culture [routine blood draw] results because if you were to wait longer, there is a higher risk of patient death essentially* (**P3, 3-4 months**)

> *For the thrombosis…I would expect that she has an anti-embolism stocking instead of an anticoagulant or antiplatelet medication. When I was in my final clinical placement at another hospital, if patients had GI bleeds, we were giving them anti-embolism compression stockings.* (**P13, 3-4 months**)

Clearly, these excerpts demonstrate that these novice practitioners drew significantly on past education and prior clinical experience to reason through the clinical scenario and arrive at a clinical decision.

At 11-12 months of experience, NGNs had considerably more clinical practice knowledge and experience to draw on which included similar patient conditions presented in the scenarios. These participants were also more familiar with the expected clinical patterns which allowed for pattern recognition and more effective medical management of each scenario. They were able to draw on prior clinical experiences to determine clinical relevance, recognizing changing patient conditions leading to a clinical decision. By recognizing certain clinical factors in the scenario, participants were able to assign relevance, which informed their next steps, determine risk or eliminate potential course of actions:

> *I would initially be concerned with desaturation from the pulmonary embolism that would affect his breathing. I would want to ensure he is going to be on some kind of anticoagulation. (**P1, 11-12 months**)*
>
> *I'd want to make sure he has adequate blood pressure. Of course, with his impaired cardiac function, he may need vasoconstrictors to help bring his blood pressure up a little bit. He is on epi [epinephrine] at 45, phenyl [phenyl epinephrine]at 200. And norepi [norepinephrine] at 45, so there's some room to play around with the dose and go up with the dose if necessary. Blood pressures 130/80. Not terrible, Heart rate 90. So that's not too bad. So as long as he's OK, I would kind of play with the medications to wean down his BP medications a little bit. I know all this from working experience"* **(P1, 11-12 months).**

Similarly, recognition of clinical scenarios from prior exposure and/or work experience, the more experienced participants were able to attribute risk and make clinical decisions efficiently and in a timely fashion.

> *I would probably get somebody else to help like the intensivist to come right away. And see if we can maybe do an ultrasound or CT and see if there's a rupture right away. Because if there is a rupture, I don't think you want to give him antihypertensives because he's compensating already, if you take that mechanism away it would make things worse* **(P2, 11-12 months)**
>
> *I would review his medication as well to see if he's on Keppra and any anti-epileptic medication like dexamethasone, I assume he would be on it because he's post-op [post-operative procedure] just to help with swelling. If not, I would probably suggest that to the doctor* **(P2, 11-12 months)**

Another participant's recent experience with a similar clinical scenario prompted her to look for specific clinical signs and symptoms.

> *I'd also want to know if anything is coming out of the colostomy. The ostomy is supposed to be putting out a little bit of stomach content, at least by the post-op day 4, I actually had a patient recently who had a similar situation. She wasn't putting anything out of her ostomy. They put her on Pegalax [laxative medication]. So, I probably would look at that.* **(P7, 11-12 months)**

> *The abdominal pain is kind of normal post-op day 4. There's a lot of pain and a lot of nerve ending firings still going on from having an ostomy and that new creation, so things aren't as it used to so. Umm. In emerg, we give a lot of IV pain meds, she's getting the SQ option for pain management on the ward, so I would intermittently transition with to PO tablets [by mouth] so that we can manage her pain and get her home* **(P9, 11-12 months)**

These excerpts revealed how exposure in clinical practice assisted this NGNs' ability to recognize, prioritize or eliminate, and act upon salient and relevant occurring aspects of the scenario.

RQ#3. How do NGN engage clinical reasoning and decision-making?

Clinical Reasoning and Decision-Making. The clinical reasoning and decision-making theme addresses the third research question that asks how NGN engages clinical reasoning and decision-making. The theme also describes factors that influence NGNs' clinical reasoning; specifically, how they isolate, eliminate, and select clinical information or steps to take to

determine relevance when faced with a new or complex clinical scenario. These steps represent the NGNs' internal cognitive reasoning processes, safety considerations, and engagement in clinical salience. For C1, this process evolves in a sequential pattern which brings out their limited memory bank to pull clinical ideas from and prioritize safety considerations. The NGNs begin by isolating outstanding events or behaviors they deemed relevant then anticipate the most appropriate interventions. With 3-4 months of experience, NGNs used the little practice exposure they had gathered with similar situations to anticipate possible occurrences and to take the necessary precautionary steps to ensure safe practice yet were unable to determine the complete picture of clinical occurrences or treatment timelines. Subsequent excerpts provide evidence of the NGNs' cognitive reasoning by isolating distinct aspects of the scenario they deemed abnormal needing further probing clinically.

> *I would do that for my respiratory and then for the flank pain, I would investigate that further, why she is having the left flank pain. Her potassium is a bit off, she's hypocalcemia, her kidney functions seem OK. I will probably ask the doctor if they need some more tests. She may be brewing something because her temp is increasing/borderline. I would anticipate ordering a CT abdomen to see what is happening* (P8, 3-4 months).
>
> *Might expect maybe a small dose like a diuretic, but it's not very concerning. And then she has some cardiac stuff going on, but it's literally stable so, Again, it's not a big concern, I would just keep going with my routine vital signs and head to toe assessments. Dietician feels she is severely malnourished with ongoing rapid weight loss. That's pretty significant (**P13, 3-4 months**).*
>
> *For the ileus, it's just a matter of making sure their gut is working and trying to get their gut to move. But also, when it is appropriate to start, maybe trickle feeds first, but you got to make sure that their gut is working first* (**P4, 3-4 months**).

When multiple factors were evident concurrently, the NGNs' ability to determine the appropriate next step was challenged. Rather, they engaged in a more linear process of determining outstanding clinical problems in isolation of the next step of prioritizing the significance of that clinical information. The initial steps involved in the NGNs' reasoning

processes were to isolate outstanding issues involved in the scenario in an uncoordinated way and subsequently attempt to prioritize them to determine clinical relevance before making a decision. Multiple clinical issues occurring at the same time complicated the reasoning process for C1 participants due to their limited memory bank to pull from:

> *Should we be introducing vaso [short-acting] instead of phenyl [long-acting] because it's just short term. Then, once we figure out his pressures, we can think about Lasix [a diuretic] to get rid of some of the excess fluid, or if its ascites, we could just tap it out. But still we would be worried about their pressure when taking off too much fluid at once* (**P7, 3-4 months**).
>
> *I don't know if I would necessarily rush to call a doctor at this point, like assuming that the doctors are going to round [a practice where physicians come to see each of their assigned patients] on patients in the morning, I would bring up the nausea and vomiting at that time after assessing it. If not, I would probably like administer some medication to see if that does any symptom relief, and then obviously if that's not working, I will use a different modality in terms of using at least 2 medications, if that doesn't work for her nausea & vomiting maybe I would bring it up to the team at that time* (**P2, 3-4 months**).
>
> *Chemotherapy was stopped, A perforated tumor, colostomy. OK, so right off the bat I would put her on oxygen, probably nasal prongs. I would put it up to like 1L to see if that would get her up to 92%. NG …and urine output was not accurately measured OK. Ah, I'm going to assume that she is dehydrated, just with nausea, vomiting. And if we don't know the accurate outputs, that's kind of hard, but with the potassium low, I would be prepared to replace fluids and electrolytes. My immediate concerns would be dehydration. Then put her on oxygen. So, I put her on oxygen. I would look for a replacement fluid. Uhm, I would start to measure the NG and urine output. She shouldn't be eating if she has an NG tube in and I would probably hang something prn for nausea. And then just let the team know and see what they want to do* (**P6, 3-4 months**).

The clinical reasoning and decision-making theme at 11-12 months of experience also demonstrated NGNs reasoning processes which were characterized by the progression of their decision-making abilities. Unlike NGNs with 3-4 months of experience, who attempted to address every presenting clinical issue on a superficial level, NGNs at 11-12 months of experience had developed a systematic means of identifying and focusing on those elements most pertinent for the overall care and safety of the patient; they had developed a sense of clinical salience. Further to this, the C2 NGNs also considered possible contributing causes to the

outstanding issue in the scenario and were able to eliminate factors they considered to be insignificant:

> *For me it's the desaturation and the pulmonary embolism. So, I would initially be considering the cause of the low oxygen. The other thing that stands out to me is his distended abdomen. So understandably, he had an ileus postop. So, I would want to be listening to his abdomen, auscultating, checking to see if he has bowel sounds. If bowel sounds are returning any kind of tinkling and so on". She went on to say this "Let me see, incision is healing, sutures are in place. I wouldn't necessarily consider infection at this point in time. But let me see, Distended abdomen it could be incision healing, it could be ileus, or he could be backed up. Of course, I'd want to do like a bit of a GI review, Is he still in PO? [i.e., nothing by mouth] Has he been slowly resuming his diet? Is he eating anything at all? Is he on clear fluids, full fluids? All that stuff. I'd do a complete review of that. But otherwise, I also of course want to check his back, see if he's got any bruising, any kinds of bleeding, any leak, in line with that AAA repair. Umm, let me see there's anything else that's sticking out* (**P1, 11-12 months**)
>
> *OK, I feel like a fever, anything below like 37.6-7 doesn't seem concerning. I would still bring it up to neurosurgery team. I know they wouldn't be concerned with it like post-op day one, because it kind of rises after surgery, but if this was a couple of days out, we're definitely calling them right away. If there's LOC overnight like I wouldn't wait till the morning for that. And just kind of say like he's not himself. Like he will need a stat CT for that. To see if there's anything developing.*
>
> *And then fever- probably going to need some aseptic work up, which is a sputum and blood cultures from two sites and then just overall like CBC lytes and extended lytes as well [common blood draw tests]. I would want to see that right away. Is he having any active seizures overnight? I would review his medication as well to see. Obviously, he would be, but sometimes the team forget, like if he's on Keppra and any anti-epileptic like dexamethasone, I assume would be the case for him because he's post-op which will help with swelling. If not, I would probably suggest that to the doctor.*
>
> *And then get neurology involved as well for an EKG to kind of get a picture of the seizure if we can. And then depending on how his fever goes either up or down, we can give him some Tylenol like after. We can give Tylenol right away, but we'll kind of maybe suggest it prophylactically, put him on a broad-spectrum antibiotic right after we've done all the blood cultures to kind of see if that will help him*" **(P2, 11-12 months)**

These quotes portray how at C2, NGNs engage in a wide range of reasoning. They discern, consider, eliminate, and prioritize an appropriate next step based on prior exposure, familiarity and having developed working memory with the clinical scenario

A second aspect of the clinical reasoning and decision-making process for the NGN is related to how NGNs, even with 11-12 months of practice, continue to seek clarity and validation about their plans of action by including interdisciplinary consult teams involved in the treatment circle. In this study, NGNs typically consulted with interdisciplinary teams to ensure patients received a safe and efficient quality of care. They also learned from the expert knowledge of these teams to enhance their decision-making abilities, particularly with unfamiliar complex clinical scenarios. Below are examples of how NGNs sought clarity from other professionals:

> *I don't know about the normal rates for that lab stuff off the top of my head right now, his hemoglobin is low 90, not super low, but no ST elevation. Umm, with his cardiac history currently I would want to see if cardiology was following him. Let me see, lengthened QT, I want to see if it's related to medication reason or if it's just as a result of the injury itself* **(P1, 11-12 months)**

> *For her discharge, I would have her [referring to the patient] speak to a dietician probably at least once, just so she can learn about what to look for and prevent so they won't need to come back to emerge, I'd want her to have a little bit of education or I mean, I guess I could provide the education myself, but I like to ask the specialist. Just on what foods to avoid and how to track what foods can cause flare ups or irritation. Because I think it's pretty personal for each individual. And then you know, I'd collaborate with my colleagues, especially the senior nurses. They always have little tricks here and there, they are experienced and helpful* **(P7, 11-12 months)**.

> *Concerning her conditioning, so I would involve lots of people that would involve dietitian, I would inform physio and yeah, I would actually refer physio, consult dietitian for sure. It's important because she's also on NG* [referring to an artificial drainage tube] **(P8, 11-12 months)**

The NGNs' responses related to exposing the pathways of their clinical reasoning and decision-making demonstrated that despite practicing for 11-12 months, some of the participants still needed validation of their clinical judgement and decisions. Unlike with C1 where their reasoning was uncoordinated and characterized by an overall sense of uncertainty, C2 participants displayed a higher level of comfort involving experts in helping them fine tune their

clinical judgement; the progress from dependent to interdependent thinking advanced the comprehensiveness and accuracy of their evolving clinical judgement.

RQ#4. What factors contribute and impede their clinical judgement abilities?

Facilitator: Clinical Practice knowledge and Knowledge of Organizational Procedures. The fourth research question sought to uncover factors that contribute and impede their clinical judgement abilities. This first section describes facilitators, specifically NGNs' knowledge of specific unit practices associated with patient care routines and speaks to their level of understanding of workplace policies and practices involved with that care. Respondents' knowledge of (or lack thereof) clinical parameters and organizational processes that guide patient care, patient assessment and nursing practices required by nurses in performing their clinical duties can facilitate or hinder their clinical reasoning. An example is when hospital units implement clinical prompts with either colors, normal range values, standardized or case-specific parameters in order to minimize errors and promote practice safety.

For these participants, prompts were specific medications orders or presenting clinical symptoms indicated in clinical pathways used in the work area. Clinical pathways or usually protocols that are physician or interdisciplinary directed orders that indicate expected outcomes and interventions to be implemented by the treatment team. These protocols can act as a yardstick to help identify relationships between clinical findings and a standardized range of expected outcomes. These prompts and protocols facilitate the identification of clinical symptoms, their actions, interventions or when to involve another member of the care team. The next few examples show how these prompts aided participants:

> *If he's coming in with fevers, he could be experiencing low white blood cell counts, which would put him at risk of febrile neutropenia. So, you'd want to put him on Neutropenic*

> *precautions as well. Yeah, so with febrile neutropenia, the patients get put on neutropenic precautions immediately at least in our unit. So, if someone has febrile neutropenic, we put them on neutropenic precautions just because they're at higher risk of developing infections. So, like you encourage them to perform good hand hygiene* (**P3, 3-4 months**).
>
> *Yeah, we use pathways for recovery after certain surgeries, like for after bowel surgery. So, it's like day one, patients should be up and moving, day 2 they should be tolerating a regular diet, it helps to anticipate what to do next* (**P7, 3-4 months**).
>
> *If I'm at work you could see the norms for albumen, written in the red thing. It would say if it's low or high right… It would tell you the results for the albumin or other blood test result* (**P8, 3-4 months**).

Even though practice guidelines, protocols or services from these consult teams gave guidance to patient care, some NGNs saw this guidance as taking away the need for them to think about what to do. One participant described the downside of reliance on technology as a practice aid:

> *I did my consolidation [referring to her final practicum as a student nurse] in emergency (ER), so there are certain things that I'm not used to, it's not like the floor where nurses know about and can be like oh, I can consult GI or call the dietician, or PT, so I'm not used to inpatient stuff as much* (**P12, 3-4 months**).
>
> *At some point, it's too constraining, you reduce the nurse's autonomy as knowledgeable experienced nurses. Like if you only follow the pathway and you never allow your own reasoning, it's not fun, not a fan* (**P6, 3-4 months**) [referring to too much reliance on technology for practice prompts

It was suggested by participants that the use of technology to aid practice by providing prompts and references (i.e., normal ranges with lab results) could be counterproductive as it prevented them from memorizing such values which led to an over reliance on technology and a dampening effect on their reasoning abilities.

With C2, practice experience and prior exposure to different clinical scenarios in the workplace, and the knowledge of typical treatment and management of those scenarios assisted NGNs at 11-12 months' time through the scenarios. Participants were now more familiar with the common treatment processes and, as a result, knew the appropriate consult team to involve in the

patient's care. In addition, greater experience enhanced the NGNs reasoning, resulting in more efficient and timely decision-making. The example below shows increased practice knowledge and extended experience with clinical scenarios facilitated the NGNs clinical reasoning:

> *I would see if there's any kind of consults, possibly thrombosis. I would see if they're following the patient. Maybe get them involved as a consult if they are not already following. I would review the medications list with the attending team to see if they want to do anything themselves or just consult thrombosis*" **(P1, 11-12 months).**

This participant's experience and prior exposure to similar choices of treatments aided her reasoning, enhancing her knowledge of appropriate treatments and next steps:

> *I definitely feel a lot better going through them the second time with a year's experience. Absolutely, 100%. It's the familiarity with everything. So when I was first starting, I wouldn't be able to tell you, the maximum ordered dose in NACU for phenyl is 200mcg. But in the main ICU it's 300mcg like I wouldn't have been able to tell you that off the top of my head and I wouldn't have been able to tell you in my unit we start with phenyl and then if he needs more or if ineffective, we'll transfer him over to ICU and essentially go from there. Now I feel more comfortable with the protocols. I'm more comfortable with anticipating what they're going to prescribe or even what I can recommend to them to the team to order* **(P1, 11-12 months).**
>
> *She had issues with mucus plugging so she may need a chest X ray to kind of further analyze that and maybe get some sputum samples as well. I wouldn't necessarily get the respiratory therapist (RT) involved, but if she does deteriorate then we can reach out to RT as well for support. We'll kind of maybe suggest prophylactically, put him on a broad-spectrum antibiotic right after we've done all the blood cultures to kind of see if that will help them. And then we can specialize after we've seen the sensitization come back and pick a better medication for him* **(P2, 11-12 months).**
>
> *I feel like I would know who to contact if I need to know certain things. I know I can definitely contact the dietitian for this, but with other things, like things I don't know about, there's always the clinical educator I can always ask about what to do* **(P10, 11-12 months).**

These findings demonstrate that with extended experience (11 – 12 months) NGNs build knowledge and gain experience with different possible patient scenarios. This familiarity with workplace practices, protocols and expected treatments contribute to their clinical reasoning and decision making.

Hindrance: Clinical Complexity. This second part of the fourth research question specifically describes factors that impede NGNs' clinical judgment abilities. Clinical complexity refers to the impact that simultaneously occurring patient demands have on NGNs and their response to patient management. In many cases, the complexity they are confronted with signals their propensity to consult other disciplinary teams involved with patient care. Concurrently, increased complexity can hinder how NGNs reason through the clinical scenarios, impacting on their inability to identify, prioritize or attach importance to outstanding clinical problems. For example, dealing with the medical surgery scenario one participant said:

> *She still feels nauseous, and this is like a week and a half out, so that's not good. Uhm, I don't know, I feel like the surgeons would be the ones to contact for that just to manage that better* (**P2, 3-4 months**)
>
> *I feel like at this point I'll probably consult palliative care [end of life consult team], this poor lady, it's just she's 72 years of age, has cancer, she's not getting therapy right now, she's not eating, they tried to put a central venous access line in [PICC line] to help her, that didn't help. She's malnourished, I feel like the goals of care should be discussed. Okay…no, we are going to keep her alive, it's just so much information, I feel dumb answering these questions. I am also at work only once every two weeks* (**P5, 3-4 months**).
>
> *Initially I will do my abdominal assessments, uh, when I look at her history in terms of GI system [gastrointestinal system], I think she has an NG tube, I would have to make sure that, like the replacement is good, like with all the care related to NG tube. Then she has left flank pain and is not able to tolerate food, so to me flank pain kind of sounds renal. So, I would make sure to get accurate urine outputs on my shift. And then we go to the respiratory, she has a mucus plug, and needs a bronchoscopy, she might be needing suction throughout my shift. And bowel obstruction, so we are back to GI. OK so for treatment, uhm it's a little confusing to me because it says she needs ICU, I need to read a little bit for this*. (**P13, 3-4 months**)

In addition to the responses detailed above, there was evidence in the nurses' responses of the ways in which patient complexity impacted the NGN emotionally at 3 and 4 months of professional practice, especially when they were uncertain and questioned their ability to reason through complex scenarios. To buttress C1 uncertainty with managing complex scenarios one

participant's remarks suggest her overwhelming feeling due to the complexity involved, she stated "*yeah, ok, oh this is scary. It's like a whole exam all over again and I am blanking out as well*" (**P10, 3 months**). At the end of the scenario discussion, another participant said, "*I think that's all my brain can get to right* now" (**P3, 3 months**); and another said, "*I feel dumb answering these questions*" (**P5, 3 months**). The overwhelming feelings caused by patient complexity and the negative effect it has on NGNs' reasoning impeded the graduate's clinical judgement and decision-making ability and contributed to their uncertainty about appropriate next steps.

The NGNs uncertainty is multifaceted and influenced C1 participants' inability to effectively prioritize or to determine an appropriate treatment or management for outstanding clinical concerns. Their uncertainty further expresses itself in a lack of confidence with determining a clinical diagnosis. Examples of uncertainty about care management and a general sense of being overwhelmed include:

> *I don't know, I'm not familiar enough with Crohn's to know if the bloody diarrhea stools are bad or in line with Crohn's and if we need to scale up on things or have a consult with like their dietary or anything like that* (**P7, 3-4 months**).

Uh, abdominal perineal resection. So, I would have to look it up to be honest, but, if I'm on the spot about resection, it means that something like some body part had to come out" (**P13, 3-4 months**).

> *I'd also be concerned about the chronic pain, so I don't know too much about the pain; Uhm, as well as the LFTS, I don't see normal ranges, so I'm not sure if that's elevated, I am kind of going off the off the rails a little bit there* (**P1, 3-4 months**).

Similarly, another graduate stated "*I want to say antibiotics because I've seen antibiotics prescribed but I am not too sure… I, yeah, I want to say that antibiotic.*" (**P10, 3-4 months**)

The NGNs uncertainty and inability to engage clinical salience and make meaning of subtle occurring factors with the complex scenario contributed to the degree to which they would seek

assistance from both nursing staff, interprofessional team members and specialty experts. In some instances, C1 participants needed prompting to consider including interprofessional team members. It took time to arrive at a decision to consult interprofessional team members.

> *Oh yeah, I forgot to say that yeah, urology should be consulted normally for flank pain, because it's probably the kidney. So yeah, sorry I forgot about involving the other interdisciplinary team, which is normally like physio to get her up, it's not good resting in bed for too long (**P8, 3-4 months**).*
>
> *I don't know how, like the services overlap because I know sometimes, like I guess, so never mind. I think like the transition here [move from emergency to a medicine patient care unit] like because I did my consolidation in emergency, there's like certain things that like I'm not used to, because it's not like on the floor being like, oh, I can consult GI or call the dietician, or PT, like I'm not used to inpatient stuff as much. Uhm, which has been harder for me to be like oh I can call the dietitian, or I can do something for PT, just like knowing these kinds of things that you don't see as much downstairs [in the emergency department] (**P12, 3-4 months**).*

Another NGN revealed a lack of knowledge of the appropriate protocols related to interprofessional consulting: "*I do feel like the whole interprofessional team thing, it's still a learning curve for me right now so and I feel like a lot of it involved that in this scenario*" (**P13, 3-4 months**).

It was suggested by participants that the use of technology to aid practice by providing prompts and references (i.e., normal ranges with lab results) could be counterproductive as it prevented them from memorizing such values. One NGN with 3-4 months of experience suggested that the over reliance on technology had a dampening effect on their reasoning abilities.

> *I think at some point ….., it reduces the nurse's autonomy from knowledgeable experienced nurses in that you only follow the pathway, you never allow [engage] your own reasoning, yeah which is what we are coming up against right now. Not a fan of too much technology use* (**P6, 3-4 months**).

In C2, some NGNs continued to experience uncertainty when faced with complex clinical scenarios and remained overwhelmed with the amount of practice knowledge needed coupled with increased workload and practice expectations required from them. At this later practice stage, difficulties with reasoning through scenarios included the inability to determine an appropriate next step, lack of confidence about their ability to perform certain clinical aspects of their role as nurses, and/or a lack in knowledge about the hospital's standard operating procedures. For example, one participant did not know the standard procedure to coordinate a patient discharge. She says:

> *she will need consults as she's going home, maybe some rehab. I'm not really aware of what sort of outpatient process is needed for this though. I don't have a lot of knowledge about this working in critical care. We hand them off to the ward care area after resolving their critical conditions* **(P2, 11-12 months).**

The same participant attempting to reason through the same scenario of higher complexity involving multiple simultaneous clinical conditions stated:

> *We can maybe do an ultrasound or CT to see if there's a rupture right away because in his case, I don't think you want to give him antihypertensive cause he's compensating and if you take that mechanism away, he will go downhill. She has a history of diabetes. We can check his blood sugar as well. I mean, I'm not too sure what you do when a patient desaturates, but they put them on a ventilator. So, I feel like this is a little bit above my level of expertise, he's still tachypneic and hypertensive, so there is an RT in ICU, so yeah, get the RT involved, get the treatment team involved, which is probably the intensivist. And then probably review the meds and see obviously if he's being treated for his pulmonary embolism (PE). He's on probably some pretty strong anticoagulants to kind of help reverse the effects of the PE, but that may be because he has a small anastomosis somewhere that's leaking.*
>
> *Umm. And then he was probably clamped for quite a while during the surgery, which can impact his kidneys. And kind of, uh, I will have a look as well as at his lower limbs to see if his circulation is still good in all four limbs. See what his vitals are. Yeah, I'm not too sure actually for this patient. Obviously, I feel uncomfortable that he has so many issues going on all at once, there's a lot going on here with this scenario and I think to me this is quite an extensive amount of clinical issues, so I would probably go the novice nurse way and kind of like ask a more senior nurse to come and help me just because there's a lot going on* **(P2, 11-12 months)**.

This participant did acknowledge the strategies put in place in her workplace to assist nurses in performing their jobs. However, even though educational days were offered, she suggested that the amount of information and the pace at which it was offered did not really help her assimilate the vital information she needed to practice knowledgeably.

> *Have two nursing educators, but what they did add this year is they offered one day critical care training that's paid, 4 hours of training and they're kind of reviewing things that sure we learned at the beginning, but when they're throwing three weeks of learning at you, there's no way you retain everything, so like information overload. So, I was really happy, like I felt safer that they're kind of like reviewing stuff. But we have one manager for like the two units. So, they manage about 40 beds, 90 staff so we barely see them* (**P2, 11-12 months)**

At 11-12 months of experience, even though participants were uncertain about aspects of their role and practice knowledge, they had started to develop a systematic way of reasoning through the scenario discussions which was informed by their prior exposure to diverse clinical situations and experience working within the clinical context and with the patient care team. They were generally able to recognize outstanding problems, prioritize in order of potential risk to the patients, and advocate for patient safety by efficiently seeking out assistance from senior colleagues. Despite this growth, C2 participants continued to feel uncertain about the appropriate next steps particularly with complex scenarios where the patient presented with multiple clinical issues simultaneously. In addition, at 11 – 12 months, the increased workload afforded them, combined with growing expectations of their practice, contributed to ongoing difficulties adjusting to the work of the professional nurse. It is apparent from the data that NGNs enter the profession without an awareness of the level of unpredictability involved in patient care. This was particularly evident when they were caring for patients with complex and evolving conditions, and without fully understanding the practice scope of their role as professional nurses. This suggests the need for extensive support upon entering the workplace in order to help

them to build on their practice knowledge levels and understand the scope of the professional nurse role.

Overall, findings from both cycles of the quantitative and qualitative data suggest that NGNs come into the workforce with an entry-level educational and theoretical knowledge base but lack the technical and clinical practice experience required to make the dynamic, highly complex decisions and judgments required of the professional nurse. Commonalities amongst C1 and C2 data groups included a poor understanding of their nursing roles, a significant and persistent level of uncertainty about workplace realities, an underdeveloped practice knowledge and confidence level, an inability to medically manage complex patient scenarios and determine appropriate next steps. Both groups were unable to recognize salient clinical factors and demonstrated superficial and linear clinical reasoning patterns that involve isolating and addressing each presenting clinical symptom on its own rather than thinking about the larger clinical picture in its entirety. Their comprehension of the various interprofessional team member's roles was superficially understood. These factors left participants of C1 from both strands to report a sense of vulnerability and feelings of dissatisfaction which depicts features of transition shock.

Over time, C2 participants gained more experience and developed a better understanding of the complexities involved in patient care and the professional nurse role. With 11 – 12 months of experience, NGNs had been exposed to different patient acuity levels, which often involved more than one illness condition or symptom occurring simultaneously. This ramping up of the care complexity they were responsible for created additional uncertainties about their performance and increased their dissatisfaction. With the increasing work responsibility characteristic of more time spent in practice, C2 participants were no longer shielded by their

new graduate/novice status. This led to feelings of diminished acceptance from teams involved in the patients care, and enhanced the graduate's dissatisfaction, experiences of burn-out, prompting thoughts of leaving their units of work.

The clinical reasoning pattern of C2 respondents was dynamic and holistical when compared to C1 participants; they could recognize salient features in a scenario and provided for some consideration of interdisciplinary teams as a resource for practice. The effects of their professional role transition remained with respect to their work relationships, struggles with practice-related expectations and uncertainty about clinical decisions relating to leadership. While confidence with independent practice increased with the graduate's work experience, a small number continued to feel less confident with independent work and were unable to manage patients with rapidly changing conditions.

Chapter Five: Discussion

This doctoral research investigated NGNs' clinical reasoning and decision-making through the following research questions**:** 1**)** What challenges do NGNs face at 3 months and at 12 months of transition into the clinical workplace? 2) How do NGNs engage in clinical reasoning and decision-making? 3) What assists NGNs in recognizing patient change? and 4) What factors contribute and impede NGNs clinical judgment abilities? Analysis involved an inductive process of data interpretation to identify a consensus about the research questions and research findings and inform the profession of ways to enhance the transition of NGNs in the clinical workplace. To this end, my analysis of the research findings will be discussed and framed around the research questions. The first describes professional role transition along a continuum in the first year of practice describing NGNs' move from professional immaturity to developing identity in their performance and clinical reasoning ability. The second finding reports the reasoning processes utilized by NGNs in the first year of practice illustrating elimination steps involved in the NGNs' cognitive reasoning to arrive at a clinical decision, including identification of the factors that hinder or foster the process of elimination. And, the third finding speaks to complexity, i.e., how clinical complexity impacts NGNs differently in their first year of practice and addresses the research question about hindrances to clinical decision-making.

What challenges do NGNs face at 3 months and at 12 months of transition into the clinical workplace?

Growth from immaturity to developing a professional identity encapsulates practice challenges NGNs face at 3 months and at 12 months of transition into the clinical workplace. It

also describes experiential and cognitive changes in the NGNs during their first year of practice. Features of professional immaturity were characterized by uncertainty and a lack of depth and superficial level of thinking in their responses pertaining to the professional nurse role enacted at both 3-4 months and 11-12 months of clinical practice. This theme depicts NGNs' superficial understanding about the scope of the professional nurse role. Additionally, findings show that the different levels of practice uncertainty were evident throughout the year and not just the early months of practice. Theoretical insights to the lack of practice depth among NGNs in the early months of practice are reported in published research (Benner, 1982; Benner et al., 2010; Duchscher, 2009; Kramer et al., 2013; Kavanaugh & Szweda, 2018; Melin-Johansson et al., 2017; Price et al., 2018; Reebals et al., 2022; Shinnick, 2022). Benner & Wrubel (1982) define clinical knowledge as "knowledge embedded in the practice of nursing" (Benner & Wrubel, 1982, pp. 11). Benner (1982) suggests the development of nurses' cognitive reasoning and performance is based on their past and distinct experiences as they move through the five novice-to-expert performance levels. Yet, it does not take into consideration complexities of a typical workday caring for patients and the ability to handle unforeseen clinical situations. NGNs' under-developed clinical patterns and memory predispose them to uncertainty and an under-developed practice knowledge due to the lack of technical practice experience with a range of clinical scenarios with varying patient complexity and acuity levels, that afford them the opportunity to apply the level of clinical reasoning necessary to manage complex situations work. In addition, in line with Sarsfield's (2013) claim to the superficial representation of patient conditions by NGNs, this doctoral study revealed a lack of depth as NGNs reasoned through practice scenario discussions, and this influenced their ability to make timely decisions and decide on appropriateness of care. Not knowing an appropriate next step with different practice

decisions among NGNs was evident in this doctoral research; respondents choosing the ‘novice nurse way’ by seeking direction from a senior nurse. From the clinical scenario discussions of cycle one, superficial understanding of the professional nurse role was exemplified in respondents’ ability and confidence with timely communication and involvement of other professional teams in the patient's circle of care. Meanwhile, in C2, the NGNs did not fully understand the extent of leadership duties required of their role and scope of practice. These uncertainties were evidence of a superficial understanding and misconceptions about differences between theoretical knowledge and knowledge needed for practice and effective patient management.

In the later months of practice, NGNs had developed clinical patterns and working memory at their units of work which allowed them to develop a more systematic approach to reasoning through the clinical scenarios. Practice challenges at 11-12 months were centred around developing a professional identity. With the additional months of experience, respondents were called upon to engage with leadership responsibilities for the first time and aspects of uncertainty and superficial understanding pertaining to the responsibility and capability with leadership was evident. Increase in role responsibility at C2 combined with patient complexity contributed to transition shock experiences in the later months of practice which gave rise to new uncertainties and an inner search for identity in the professional nurse role. With increased familiarity to clinical scenarios respondents in C2 had developed practice knowledge and understanding with patient symptoms and needed little or no prompts with clinical attributes to determine relevance accurately. Studies in support of Benner’s work suggest years of experience and the benefit of repeated exposure to clinical patterns that build confidence in the nurses’

ability of nurses to include Melin-Johansson, Palmqvist, and Ronnberg (2017) and Nibbelink and Brewer (2018).

Meanwhile, Duchscher's stages of transition (2009) suggest NGNs' lack confidence and competence within 1-4 months of practice but when they have developed advanced thinking and reasoning within 8-12 months, they start to feel comfortable in their roles and have a transformed identity as a nurse. In this doctoral study, respondents at C2 months identified with an increased ability to carry out their role and could prioritize and recognize patient change successfully. Yet uncertainties with managing patient complexity and role identity persisted, characterized by an inability to manage workload that came with increased role responsibility, as well as exposure to bullying behaviors which caused some to contemplate leaving their units of work to seek out more stable work environments. At C2, participants felt comfortable and confident about their advancements in practice but seemed uncertain about their professional growth and identity. In these later months of practice, NGNs assume more practice responsibilities as part of their role and are no longer shielded by their NGN status, which was evident in this study by close to half the NGNs considering leaving the profession. Likewise, with the scenario discussions, NGNs were comfortable with their developed clinical knowledge at C2 yet uncertain with more complex scenarios, leaving respondents overwhelmed with the management of complexity resulting in their inability to determine an appropriate next step. NGNs were vulnerable when handling complex patients with unfamiliar clinical conditions during the first year of practice due to an under-developed clinical pattern preventing them from recognizing patient symptoms in their early months of practice. This was similar to Kramer et al (2013) and Benner's (2009) work. Findings of this doctoral research suggest NGNs inability to handle complexity can persist in later months of practice with increased vulnerability when faced with managing multiple

patient conditions and workplace demands of a nurse's role, all occurring simultaneously within the context of increased workload, role responsibility and leadership required in the workplace. Duchscher (2012) suggested a healthy professional transition occurs when new graduates successfully progress through the stages in a holistic way, not restricted to clinical competencies only. As such, from this study findings, transitioning through the professional nurse role is not limited to the early months of practice but can extend into later months of practice.

A second aspect of the professional immaturity to identity development theme which revealed practice challenges NGNs face in their first year of practice is characterized by diminished confidence level in their ability and performance resulting from the scope of practice knowledge required. This realization is in line with Halverson, Tregunno, and Vidjen's (2022) concept analysis of nurses professional identity formation whereby NGNs' in this research study portrayed different aspects of "dissonance and alignment" (p. 11) in the discovery of workplace realities in an attempt to construct and make sense out of new practice experiences as new nurses in their first year of practice. Similarly, NGNs' challenges with clinical practice have been attributed to a lack of confidence in their decision-making abilities in previously published work (Kaldal et al., 2022; Melin-Johansson et al., 2017; Nibbelink & Brewer, 2018; Purling & King, 2012). In this study NGNs lacked confidence practicing independently or they felt uncertain in their ability to practice independently. NGNs lacked confidence consulting other disciplines and in their clinical judgement and decision-making ability. NGNs were uncertain as to the scope of interdisciplinary involvement in patient care and portrayed a superficial understanding of advanced nursing roles such as nurse specialist or advanced practice nurses and their involvement in patients' circle of care. Uncertainty which led to diminished confidence levels about the scope of advanced nursing roles and leadership competencies persisted at 11-12

months of practice. However, NGNs in C2 had developed working memory about patients' clinical presentations which facilitated their decision-making and ability to advocate for timely care for their patients. Several authors and their work suggest the lack of confidence contributes to poor decision-making among NGNs poor decision-making (Benner, Tanner & Chelsa, 1992; Hawkins, Jeong & Smith, 2019). Hoffman and Elwin (2004) question the existence of a relationship between confidence levels and NGN ability to make clinical decisions. Yet, in this study, NGNs' lack of confidence in their reasoning abilities as a result of inexperience seem to underpin their inability to determine an appropriate next step. Their NGNs' lack of confidence contributed to an inability to reason through and know what the appropriate next step with simple or complex scenario was at each instance. Additionally, as seen in the later months of practice, lack of confidence with independent practice and leadership competencies was common. Hence, the lack of confidence within the first year of practice can be attributed to inexperience with certain practice competencies. Practice challenges stemming from an under-developed cognitive reasoning ability and confidence level associated with new graduate nurses entering the workplace remains a concern for practice safety and readiness for the professional nurse role and has the potential to compromise patient safety and the overall quality of nursing service (Murray et al., 2017; Saintsing, et al., 2011). This draws attention to the need to prioritize the development of NGN reasoning capability as they enter the workforce as well as introduce practice competencies and the appropriate support during the first year of professional practice to promote a healthy professional identity formation.

How do NGNs engage in clinical reasoning and decision-making?

A linear approach in C1 to systematic approach to reasoning in C2 describes NGNs' decision-making ability to both understand and process clinical scenarios holistically from the

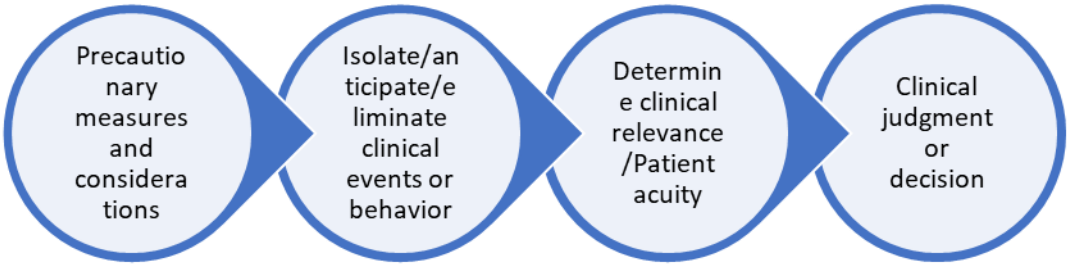
early to later months of practice. The NGNs' reasoning patterns from the early to later months of practice were characterized by a linear, analytic pattern of reasoning. In the early months NGNs demonstrated an inability to draw together and take account of all occurring clinical factors related to the scenarios. In the later months, NGNs, through additional months of experience, had developed a systematic way of recognizing, eliminating, prioritizing, and determining a suitable next step. These findings support the claims of previous research where NGNs in the novice stage were found to reason analytically, approaching each presenting clinical factor independently and not in relation to other clinical factors (Sarsfield, 2013; Kaldal et al., 2022; Jessee, 2021; Kramer et al., 2013; Marino, Andrews, & Ward, 2020; Oliver & Butler, 2004; Price, Pretz, & Zulkosky, 2016). An analytic approach to reasoning posits NGNs reason by breaking down clinical components into their individual parts to gain understanding of clinical occurrences (Marino, Andrews, & Ward, 2020; Price, Pretz, & Zulkosky, 2016) and would engage in analytic reasoning when involved with novel and unfamiliar situations. In addition, a linear approach to reasoning at C1was engaged with unfamiliar circumstances which was typical for NGNs in this study as they encountered different patient scenarios for the first time contributing to their inability to comprehend and manage competing clinical occurrences happening at the same time.

In the later months NGNs demonstrated enhanced familiarity with the scenarios as similar clinical scenarios would have taken place on their respective units, so they were able to recognize clinical cues and had developed the ability to prioritize. Thus, they used less linear means of knowing and reasoning and more intuition with familiar clinical situations and is consistent with findings from previous research (Price, Pretz, & Zulkosky, 2016).

Another feature of NGNs' linear pattern of reasoning and thinking was evident in the ways relevance was attributed to different factors. The NGNs tended to identify isolated occurrences at 3-4 months and then subsequently eliminated unlikely options in the decision-making process. For example, with the clinical scenario discussions, NGNs approached each scenario based on presenting patient symptoms in an uncoordinated way. They were unable to categorize potential risk and identify salient cues about the scenario. This was in keeping with Sarsfield's (2013) claims that novice nurses "sought information to help them define the clinical problem" (p. 448). Rather NGNs addressed each presenting symptom in successive sequence without prioritization or attributing relevance which fundamentally characterizes analytic approaches whereby as Orlando (1958) and Oliver & Butler (2004) suggest, problems are identified, and potential interventions and solutions are determined, implemented and evaluated following the nursing process as taught in schools of nursing for decades. Jessee posits NGNs' ability to notice clinical cues does not guarantee their ability to determine relevance of cues. The inability to determine relevance was noted in this study in that NGNs in their early months of practice were unable to determine appropriate relevance of clinical cues, despite their ability to notice outstanding clinical attributes about the scenarios. This can be attributed to a superficial understanding of clinical occurrences based on limited practice experience and precautionary considerations which contributes to their reasoning in silos at 3-4 months. Figure one below depicts a representation of linear approach to reasoning engaged by NGNs at C1.

Figure 3.

Conceptual Model Depicting the Linear Nature of NGNs' Reasoning at 3-4 months.



Note. Linear process of reasoning at 3-4 months.

In contrast at 11-12 months, NGNs had accumulated prior exposure and were able to determine appropriate next steps. They were able to isolate, eliminate, determine relevance, or prioritize unlikely options or interventions and determine a course of action. Previous studies have identified such processes of clinical reasoning and decision-making with nurses with experience (Jessee, 2021; Marino et al., 2020; Tanner, 2006). Central in their findings was the role of experience in facilitating pattern recognition and the ability for nurses with practice experience to organize reasoning, drawing on memory from past experiences to formulate a clinical decision. The findings of this study are consistent with these patterns. NGNs in this study at 3-4 months reasoned through the scenarios in an uncoordinated way and were unable to identify salient occurring attributes; yet at 11-12 months, they could recognize salience and had developed the ability to determine an order of care and prioritization in a systematic and holistic way. While clinical reasoning as a skill isn't measured in traditional nursing curriculum and clinical teaching (Liou et al., 2015), there is evidence to suggest clinical nursing education meant to bridge the theory to practice gap for nursing students and new graduates fail to do so as

clinical experiences are heavily based on the preferences of clinical instructors rather than workplace competencies (Herron, 2017). This disconnect is likely to contribute to workplace unreadiness seen among NGNs entering the workforce. In this study NGNs at C1 had an under-developed representation of clinical scenarios, presentations, and memory demonstrated by their struggles with reasoning through complex situations which were often non-linear and multifaceted. C2 participants with more practice experience had developed clinical memory and were able to discuss the scenarios in an automated and systematic way. Claims to intuitive reasoning ability by nurses with experience has been identified by authors in the field (Benner, 1982; Forsberg et al., 2016; Marino et al., 2020; Sarsfield, 2013). This difference in reality was evident with the NGNs in this study in that their decision making was framed by safety, e.g., fear their actions or inaction would have detrimental effects to patients, and accuracy in judgements were important. An example was their use of protocols and guidelines to guide reasoning. In contrast to the latter months where practice experience and knowledge of appropriate next steps informed subsequent actions and decision-making and their performances were shaped by patient advocacy, providing efficient, quality care and not from an uncertain position. NGNs in their early months of practice used linear reasoning approaches characterized by a unilateral direction of reasoning centered on accuracy in judgement. Due to their uncertainty and superficial understanding of clinical patterns, they relied on practice protocols and guidelines to guide decision-making and as a means to increase awareness of clinical patterns. While NGNs with practice experience relied on memory from prior exposure and familiarity to reason through and determine an appropriate order of action in a timely, efficient, and systematic fashion thereby advocating for the patients. This way of reasoning is typical of intuitive reasoning utilized by expert nurses identified by scholars in the field (Benner, 1982; Sarsfield, 2013). In addition to the

importance of pattern recognition, which NGNs in their early months lack the ability and memory to engage with, there is a need for developing process accuracy in sequencing and prioritization to augment learning, knowledge transfer and application with novel clinical situations.

What assists NGNs in recognizing patient change?

NGNs used previous clinical practice knowledge learned during clinical practice placements of formal education, exposure on their units of work and organizational policies and practice guidelines upon entering the workforce to recognize, guide and assist their decision-making. NGNs are vulnerable as they enter the workforce with limited capacity for clinical reasoning contributed to by a lack of practice experience and an underdeveloped resource pool of memory causing them to miss vital clinical cues. This sense of vulnerability also explains their reliance on senior nurses, protocols, and practice guidelines to aid their decision making. The findings in this study are consistent with published work that suggests NGNs utilize a combination of past formal education and experience, reliance on environmental practices and procedures, as well as their nurse colleagues as information sources to guide clinical reasoning and judgement (Benner, 1982; Benner & Wrubel, 1982; Jessee, 2021; Herron, 2017; Sarsfield, 2013; Marino et al., 2020; Oliver & Butler, 2004; Price et al., 2016; Tanner, 2006). NGNs rely on prior exposure from past practice experiences to make clinical decisions even though knowledge and clinical practice experiences while in school seem insufficient to prepare NGNs for practice (Herron, 2017; Kavanagh & Szweda, 2017; Mirza et al., 2019). This unpreparedness was evident in this study in that NGNs were unfamiliar with the complexities of patient care scenarios and illness presentations and had no decision-making experience associated with accountability and responsibility of the nurse in charge with patient care. Findings revealed

clinical reasoning and judgment expectations and involvement with patient care as a student nurse were quite distinct from that of graduate nurses. When faced with real-life patient scenarios, participants found their past clinical experience and education were insufficient to support sound reasoning and judgement. They had minimal knowledge and experience in the use of policies and practice guidelines and a lack of familiarity with the disciplinary teams involved in patient care. Their superficial knowledge of practice competency and policies contributed to several practice uncertainties; and lack of practice confidence.

In this doctoral study, NGNs with 11 – 12 months of experience had built on their practice experience and knowledge, they knew what to do when faced with the scenarios, they could identify who to consult, and could talk appropriately about treatment plans including who to involve. Similar to authors in the field, NGNs with practice experience are able to recognize clinical cues and had developed memory and practice representations (Benner, 1982; Forsberg et al., 2016; Kramer et al., 2013; Oliver & Butler, 2004; Sarsfield, 2013; Tanner, 2006). The findings from this study demonstrate that NGNs practice experience and time in the professional nurse role acted as a valuable resource that guided their reasoning. From prior exposure to different clinical situations and practice knowledge, participants had increased their familiarity with interdisciplinary teams, practice guidelines and procedures, and thereby facilitating their ability to recognize patient change, prioritize, make good clinical decisions and engage in intuitive reasoning with ease. In addition, given NGNs' use of linear reasoning as uncovered in this study as they enter the workforce, organizational practices such as guidelines, clinical prompts and protocols, and prescriptive practices by physician teams acted as a frame for decision-making and aided their ability to recognize patient change and clinical reasoning and judgment ability as they created their individual cognitive representations and memory about

patient scenarios. Rohde and Domm (2017) suggest nurses' clinical decisions were either facilitated or hindered by workplace cultures and standards. Findings from this study suggest a need to shift our attention from preparing NGNs' practice skills and competency in isolation within the boundaries of successful demonstration of a skill during formal education, to contextualizing skill execution within a clinical problem to build their reasoning capacity.

***What factors contribute and impede NGNs clinical judgment abilities*?**

Practice complexity involving patient's illness condition, treatment and management, constituted a major hindrance to NGNs' clinical reasoning in this study. The complexity of patient conditions contributed to NGNs' uncertainty and the NGNs' sense of being overwhelmed with different aspects of the professional nurse role and responsibility at early and later months of practice. The negative impact of practice complexity on NGN performance due to a healthcare environment characterized by seriously ill and demanding patients, short hospital stays, multiple comorbidities has been documented (Baumann et al., 2017; Gonzalez., 2021; Kaldal et al., 2022; Kramer et al., 2013; Lasater et al., 2015; Melin-Johansson et al., 2017; Murray et al., 2017; Nibbelink & Brewer, 2017). Kramer and colleagues (2013) report the challenge NGNs experience with workplace complexity and the interconnectedness between clinical environment and patient illness condition. Likewise in this doctoral study due to their lack of experience, C1 participants had demonstrated difficulties with managing patient complexity and the effective prioritization of clinical symptoms presented in the scenarios. Their ability to manage complexity was inconsistent even at 11-12 months in that some respondents were unable to manage complexity with the scenarios or understood the scope of involvement of the various teams involved in the patients circle of care which influences decision-making about treatments. In addition, C2 uncertainty with leadership responsibilities persisted. The NGNs felt

overwhelmed by the amount of practice knowledge they were required to know upon entering the workforce which constituted a hindrance to them and was evident by their inability to effectively prioritize, to attach relevance to clinical patterns, to comprehend the various interprofessional teams involved in patient care and determine an appropriate next step, particularly in the early months of practice. Participants could recognize clinical symptoms in the scenario but did not understand the significance of the clinical presentation in an efficient, timely and comprehensive manner like they did in the earlier months of practice buttressing their superficial level of reasoning. Additionally, C1 participants had not developed therapeutic relationships with patients and their families and were unable to manage complexities that include family members.

At 11-12 months, NGNs had developed a systematic approach to reasoning, were able to recognize outstanding problems, had become better at workload management compared to their earlier months of practice, they could prioritize in order of potential risk and advocate for the patient's safety by seeking out assistance from colleagues or from consult teams in a timely way. The result of their experience, memory and prior exposure to different clinical scenarios constituted practice facilitators for C2 participants. Pivotal to clinical reasoning among NGNs in this study was the practice time required to develop the skill of reasoning. Certain factors constituted facilitators that aided their reasoning and decision-making ability. These factors include familiarity with different clinical scenarios, exposure to and knowledge of workplace protocols, guidelines and other contextual aids, professional teams involved in the patients circle of care, as well as practice knowledge required in their respective work settings. At 11-12 months, patient safety, efficiency of care and patient advocacy were increasingly important to the NGNs. Similarly, authors in the field have attributed time and efficiency in clinical decision-

making by NGNs in the later years of practice (Kaldal et al., 2022; Lasater et al., 2015; Norman, 2005; Shinnick, 2022). Based on C1 and C2 experiences, an integrated approach is vital to develop clinical reasoning, one that explores effective prioritization and workload management and content accuracy that identifies or recognizes clinical patterns with skill demonstration among NGNs as they enter the workforce.

In summary, NGNs first year of professional practice is characterized by uncertainty and a superficial level of clinical reasoning which contributes to a sense of vulnerability and transition shock. This was demonstrated in their inability to reason through complexity whereby they are faced with multiplicity and synchronicity. Despite formal nursing education and preparation for clinical practice, findings from this study confirm in addition to published literature which suggest there are inconsistencies with NGNs clinical exposure during the four years of educational formation in nursing programs. In the later months of practice, NGNs' ability to manage patient workload and the complexities surrounding effective management of patient care and salience improved due to a developed clinical pattern and working memory based on experience and prior exposure. Yet, leadership competencies, professional development and effective work-life balance constitute elements of transition shock for the NGN. With the time needed to grow reasoning and clinical judgement competencies, attention to the development of process and content accuracy are crucial and constitute two components of clinical decision-making identified in this doctoral research.

Conclusion

This doctoral research investigated NGNs clinical reasoning and decision-making in their first year of professional practice as nurses. The specific research questions were as follows: 1**)** What challenges do NGNs face at 3 months and at 12 months of transition into the clinical workplace? 2) What assists NGNs in recognizing patient change? 3) How do NGNs engage in clinical reasoning and decision-making? and 4) What factors contribute to and impede NGNs clinical judgment abilities?

Based on findings from the mixed methods design, it can be concluded that transition shock and its effects are critical aspects to consider when providing support for NGNs during their first year of practice. At 3 months of practice experience, it was clear NGNs lacked the understanding and ability to manage the workplace complexity that concerns patient care. This contributed to layers of transition shock on all four components of the professional nurse role included in the survey instrument which consisted of nurses' role, responsibilities, relationships, and knowledge. Notably, NGNs with 3 months of work experience were unable to determine an appropriate next step and manage symptoms occurring simultaneously when faced with rapidly changing patient conditions. As a result, they relied on their nurse colleagues and workplace prompts to guide clinical reasoning and judgment. From Cycle One, it is evident that NGNs engaged in a step-by-step reasoning pattern, addressing each clinical situation in a sequential fashion. NGNs at 3-4 months of experience lacked the ability to prioritize or notice saliently occurring symptoms and appeared to not understand the total picture.

In contrast, at 11-12 months of practice experience, NGNs had developed familiarity with patient conditions and their everyday roles and responsibilities, and they took on added duties

and leadership responsibilities for the first time. This left NGNs in Cycle Two with conflicting sentiments about the professional nurse role leading some to consider leaving the profession or seek other units of employment. The results indicate the way NGNs experience components of transition shock changes throughout their first year of practice, which impacts their reasoning and decision-making ability. Uncovering the effect of transition shock in their first year of practice and its significance to patient care and safe practice, supports calls for the implementation of workplace strategies that promote the development of the ability to prioritize in the management of clinical scenarios in their first year of practice.

Second, this research adopted a mixed methodology approach using the PRT-RAI survey which consists of four components of the professional nurse role. Little is known about NGN clinical reasoning processes and the factors that influence their clinical reasoning and judgement ability as they enter the workforce. This led to the use of mixed methods as the study design. Administering the study instrument and the qualitative discussion about real life clinical scenarios with NGNs in the early (3-4 months) and again later in the first year of practice revealed the superficial reasoning level of NGNs. Findings suggest NGNs in Cycle One have a superficial understanding about their ability to manage rapidly changing clinical patient conditions and workplace complexity. Based on the C1 survey results, more respondents indicated their ability to manage clinical complexity yet from the scenario discussions, their responses were a mismatch to their ability to respond to and notice saliently occurring clinical symptoms within the scenarios. This suggests a lack of awareness about their performance and what is required of them as nurses in the early months of practice. Complexity cannot be recognized when clinical patterns involved have never been seen (Benner, 1982). Therefore, future research that builds on this thesis findings about NGNs lack in prioritization abilities is

necessary to inform our understanding of NGN ability to see clinical patterns and discern from competing priorities, thereby building their ability to mentally stack clinical patterns. The importance of developing strong clinical practice knowledge and competence to complement formal theoretical knowledge is vital. Responses to the survey instrument in Cycle Two seemed to uncover richer responses which portray an in depth understanding of the professional nurse role.

With regards to contribution to the current literature which reveals that NGN's lack of situational awareness of patient conditions and occurrences resulting in uncertainty and the inability to effectively manage, anticipate and determine an appropriate next step involving complex and multifaceted patient conditions. Evidence across a range of literature suggests that there is a need for attention to be given to developing NGNs' cognitive reasoning about patient conditions and to make explicit NGNs' clinical reasoning in the workplace. Gonzalez et al. (2021) recommended the need for more studies that could shed light on the cognitive processes needed for NGNs to make sound clinical judgements and Murray et al., (2017) highlighted the need to understand how NGNs think through clinical scenarios with an emphasis on how that thinking translates into their clinical insights. This research builds on the current literature in that NGNs' inability to prioritize and the linear nature of their reasoning was revealed through the clinical scenario discussions. This serves as a vital first step in understanding NGN reasoning processes and contributes to addressing this knowledge gap in published literature. A commitment to utilizing teaching strategies that foster high level reasoning and judgment competence is necessary, beginning from formal classroom education and practice placement opportunities during nurse education. In addition, formal nursing education knowledge has been shown to be insufficient to meet professional practice demands in the workplace (Jessee, 2021;

Sarsfield, 2013; Kavanagh & Szweda, 2017). Utilizing high level reasoning strategies in formal and clinical nursing education is likely to give NGNs the opportunity to develop the ability to attach relevance to different presenting patient conditions and highlight the importance of developing process accuracy in sequencing and prioritization which augments learning, knowledge transfer and application with novel clinical situations. Findings from this study suggest a need to shift our attention from preparing NGNs practice skills and competency in isolation within the boundaries of successful demonstration of a skill during formal education to contextualizing skill execution within a clinical problem in practice to build on their reasoning capacity.

This doctoral research draws attention to the connections evident across Duchscher, Benner, and Kramer et al.'s theoretical perspectives in understanding NGN clinical reasoning and decision-making (Benner, 1982; Kramer et al., 2013; Duchscher, 2008) and uncovers the role of workplace learning, specifically the development of clinical practice knowledge as a vital component of preparing NGNs for the workplace. Work environments either facilitate or hinder the development of clinical practice reasoning among NGNs. These three frameworks provide significant insights into the transition of NGNs from preparation to workplace practice but are unable to advance our understanding about workplace learning processes and the development of clinical reasoning among NGNs. Further research that expands our theoretical understanding of the development of clinical reasoning among new nurses within clinical settings is required. Specifically, the discipline would benefit from better understanding of the connections between pattern recognition and process accuracy with patient conditions within practice settings. The integration and exploration of elements of NGN prioritization abilities within all four

components of the PRT-RAI would likely inform this aspect of transition shock and add to our overall theoretical understanding of professional role transition experience among NGNs.

Future Implications and Recommendations

Rodgers (2000b) suggests the inclusion of future implications to build on research findings and as a basis for further inquiry to add to a comprehensive understanding of clinical decision making among NGNs. As such, future implications will be provided next.

Nursing Practice. NGNs undergo reality and transition shock as they encounter the real life experiences of the workplace (Duchscher, 2008; Kramer, 1974) causing emotional, practice, mental and social challenges which are apparent in theory-to-practice gaps, lack in competence and practice skill, an inability to manage or anticipate changing patient health conditions and/or to cope with initial workplace demands as demonstrated by this research findings and other published work (Ankers et al., 2018; Doughty et al., 2018; Flaunders et al., 2017; Kavanagh & Szweda, 2017). NGN nurse colleagues perceive them as weak due to their status as new graduates (Doughty et al., 2018); and as portrayed in this research and supported by authors in the field, the new graduates themselves perceive their practice level as not matching the demands of the work environments (Sarsfield, 2013; Shinnick, 2022). Given the superficial knowledge and performance practice gap and an emotionally vulnerable position of new graduates entering the workplace, the need for evaluation and measurement of clinical reasoning as a skill and competence is crucial. The value of measuring clinical reasoning within nursing schools and practice areas have been demonstrated (Forsberg et al., 2016; Liou et al., 2015). An awareness of practices that entail prioritization and patient management within work settings to employ the use of clinical reasoning is vital, especially since clinical decisions are constantly made in

environments characterized by high patient acuity levels where decisions are made quickly and with significant consequence (Kramer et al., 2013; Ebright, 2012). A combination of process reasoning accuracy demonstrated by effective prioritization and content, or performance accuracy determined by clinical tasks are likely to promote the development of NGN reasoning ability in a complementary way and build on their memory about practice situations. Future research that explores the use of multiple teaching strategies and problem-based learning grounded on specific patient populations or areas of work can add to our understanding of clinical reasoning and decision-making in the NGN during their early months of practice.

Nursing Administration. Nurse administrators play an influential role in the structure and content of transition programs to reflect the specific needs of their respective units (Bakon et al., 2018; Missen et al., 2015), and in the effective planning, support and promotion of positive workplace attitudes for NGNs during transition (Chant &Westendorf, 2019; Daws et al., 2020). Contextual influence such as practice standards and policies that support nurses in performing the professional nurse role in clinical settings is important in that NGNs require routines, guidance and checklists in the early months to shape their practice and complement their analytic reasoning abilities as they develop their performance, build on experience and cognitive abilities (Benner, 1982; 2001a; Kramer et al., 2013; Kaldal et al., 2022 Sarsfield, 2013). Given the importance of accuracy with process reasoning (Norman, 2005) required for effective prioritization in the workplace, there is a need to shift attention from solely on NGNs meeting checklist criteria to include attention to underlying reasoning behind their action and decision-making. Emphasis centered on mere descriptions and task completion, rather on an exploratory description and inquiry in order to promote clarity and uncover iteratives occurring during reasoning.

Nursing Education. The complexity of healthcare environments, patient acuity levels, illnesses and disease, advances in technology use in health care requires the development of a higher order of reasoning to effectively manage patient care and treatments and early recognition of clinical cues (Forsberg et al., 2016; Hoffman & Elwin, 2003; Liou et al., 2015). Based on these findings, continual focus on NGNs meeting competency skills lists and task performance alone is insufficient in fostering higher order of reasoning ability (Jessee, 2021; Kaldal et al., 2022). Rather, emphasis on developing clinical reasoning starting from nursing schools through to when NGNs enter the workforce is necessary (Herron, 2017). This research demonstrates the use of real-life patient scenarios can provide clinical reasoning and judgment opportunities that could build on this vital competence among NGNs. So far, studies show NGNs rely on individual nurse's practice knowledge and instruction which can lead to practice inconsistency (Herron, 2017; Liou et al., 2015). Yet, role ambiguity exists about how the preceptor-mentor carry out their role (Daws, McBrearty & Bell, 2020). Attempts to standardize preceptor-mentor educational preparation in clinical areas can bridge the gap about role clarity. A combination of teaching strategies has been proposed as an approach to enhance NGN learning experience as they enter the workforce (Brook et al., 2019; Rush et al., 2019) for instance, a combination of classroom time, hands-on teaching and apprenticeship, and dyad models with peer support (Zhang et al., 2016). A multi-level support for the development of clinical reasoning, its application and evaluation are likely to promote educational preparedness to support the development of clinical reasoning among NGNs and their ability to effectively manage complex patient situations.

Nursing Research. Findings from this doctoral research lend weight to the need to foster early development of higher cognitive reasoning among NGNs as they enter the workforce.

Clinical reasoning is a teachable skill with the clear potential for development (Benner et al., 2010; Jessee, 2018; Michels, Evans & Blok, 2012). Even though NGNs in the novice stage require competency checklists to guide practice early in their career (Benner et al., 2010), there is value in exploring the benefits of engaging process accuracy in reasoning and decision-making among NGNs to make explicit their cognitive patterns and processes. Findings from this research show that NGNs are unable to grasp the full picture with complex patient conditions and they isolate and address symptoms in isolation in a sequential fashion, not in order of priority. NGNs rely on the individual instruction of nurses with experience or clinical instructors to shape their reasoning ability when they enter the workforce (Herron, 2017; Liou et al., 2015). Given potential inconsistencies with current practice and the lack of measurement of clinical reasoning competence as a skill in nursing education or practice areas (Liou et al., 2015) future research can build on these research findings using problem-based learning to explore NGN reasoning ability. By doing so, enriching current understanding about NGN decision-making abilities. Additionally, outcome evaluative studies to determine the influence of research strategies that utilize process accuracy interventions on NGN clinical reasoning and judgment would be beneficial in having an in-depth understanding of NGNs reasoning and how to best offer support in their early months of practice.

Limitation and challenges. A possible limitation of the study is the time constraints in conducting a PhD thesis within the research design timeline which may have led to the omission of potential participants with unique experiences that influence their reasoning abilities at the workplace. Additionally, time constraints and experience as a graduate student performing MMR with the lack of adequate graduate student preparation in MMR design. Knowing my lack of experience, I consciously sought publications and studies that have used MMR design to develop

my understanding of performing MMR. Exemplary publications include Hesse-Biber and Burke (2013) and Teddlie and Tashakkori (2009). Additionally, my thesis supervisor and committee members with MMR experience guided my research process and methodological decisions particularly within the constrained time frame of completing thesis research as a graduate student.

Secondly, the demands of managing the collection, synthesis and interpretation of MMR data is rigorous for novice researchers involving mental efforts to manage two streams of data collection. Having the guidance of my PhD supervisor and committee members with experience doing MMR was beneficial. Without having a systematic way of data analysis with MMR can be a limitation leading to the risk of interpretation biases given my position as nurse educator and knowledge of clinical processes at the recruiting hospital. Having frequent meetings and multiple reviews of my analysis with my supervisors ensured any biases were eliminated.

Third, a smaller sample size than anticipated in Cycle Two also posed a challenge for accurate comparison of data. Future studies with larger sample sizes are recommended for more decisive analysis and conclusions.

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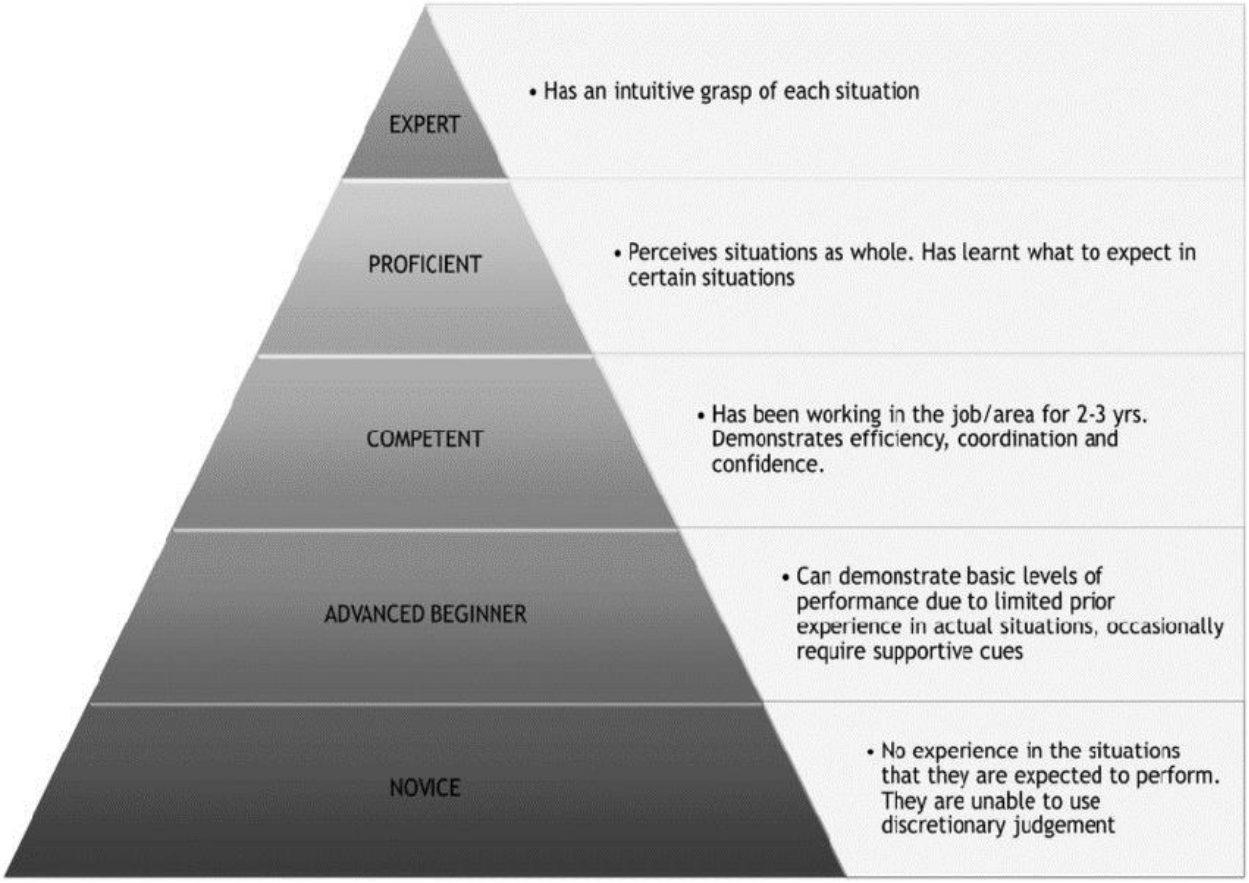
Appendices

Appendix A

Benner's novice to expert stages of skill acquisition



Appendix B

Duchscher's stages of transition shock model

Appendix C

Duchscher's professional role transformation-risk assessment instrument (PRT-RAI)

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Not Applicable
RESPONSIBILITIES [RS] (13 items)						
RS1/JS I understand my responsibilities as a practicing nurse.						
RS2/ITS There are times I have considered leaving my current workplace.						
RS3/CO I am confident calling a physician about my patients/clients/residents.						
RS4/CO I am confident speaking with the Patient Care Coordinator/Charge Nurse about my patients/clients/residents.						
RS5/CO I am confident working with other disciplines (i.e. physiotherapy).						
RS6/CO I am confident consulting other disciplines (i.e. social work).						
RS7 My responsibilities as a practicing nurse are clear.						
RS8/JS I participate in the social culture of my workplace (i.e. socialize with colleagues).						
RS9 I sometimes confuse my previous role as a student with my current role as a practicing nurse.						
RS10/CO/DM I am confident in the clinical judgements and decisions I make.						
RS11/CO/CJ/DM I am confident practicing independently as a nurse.						
RS12/JS I think about work on my days off.						
RS13/CO I feel confident caring for families.						
ROLES [RO] (12 items)						
RO1 I understand what others expect of me (i.e. senior nurses/physicians/licensed practical nurses/healthcare aides or care assistants).						
RO2/ITS There are times when I have questioned my decision to become a nurse.						
RO3/JS I understand the differences b/w my role and the role of the unit clerk.						
RO4/JS I understand the differences b/w my role and the role of my nursing partners (Licensed or Registered Practical Nurse).						
RO5/JS I understand the differences b/w my role and the role of the healthcare aide/care assistant (non-registered/non-licensed care worker).						
RO6 I take a leadership role in my workplace.						
RO7/JS I feel respected by the nurses I work with.						
RO8/JS I feel respected by the healthcare aides or care assistants I work with.						
RO9/JS I feel respected by the physicians I work with.						
RO10/JS I am able to balance my personal life with my work life.						
RO11/JS My role as a nurse is what I thought it would be.						
RO12/JS Moving from student to nurse was more difficult than I expected.						
RELATIONSHIPS [RL] (22 items)						
RL1 I am seen as a leader in my workplace.						
RL2/JS I feel accepted by the nurses I work with.						
RL3/JS I feel accepted by the healthcare aides or care assistants I work with.						
RL4/JS I feel accepted by the physicians I work with.						
RL5 I know how to report a practice concern in the workplace.						
RL6 I feel safe reporting professional behavior that concerns me.						
RL7/JS I have experienced bullying by other nurses in my workplace (**BULLYING** is defined as any speech or action that disrupts the harmony of the work environment and includes, but is not exclusive to rude, impolite and disrespectful oral or written words, gestures, actions or behaviours).						
RL8/JS I have experienced bullying by the Nurse Manager in my workplace.						

RL9/JS I have experienced bullying by the Patient Care Coordinator/Charge Nurse.						
RL10/JS I have experienced bullying by a physician in my workplace.						
RL11/JS I have experienced bullying by a healthcare aide or care assistant in my workplace.						
RL12/JS I feel safe approaching the Nurse Manager.						
RL13/JS I feel safe approaching the Patient Care Coordinator/Charge Nurse.						
RL14/JS I feel safe approaching the Nurse Educator in my workplace.						
RL15 /JS I feel safe approaching my mentor.						
RL16/JS I feel safe approaching senior nurses in my workplace.						
RL17/JS I enjoy being a nurse.						
RL18/JS I feel welcome in the workplace.						
RL19/ITS I have considered leaving nursing as a profession.						
RL20/ITS I plan to leave the profession of nursing.						
RL21/JS I take time to practice self-care.						
RL22/JS My workplace recognizes and supports my transition.						
KNOWLEDGE [KN] (14 items)						
KN1/CO My formal education prepared me to practice as a professional nurse.						
KN2/CO I feel confident performing the skills required of me.						
KN3/CO I feel confident caring for complex patients/clients/residents.						
KN4/CO/CJ I feel confident responding to changes in the clinical status of my patients/clients/residents.						
KN5/CO/CT I feel confident in my ability to think critically.						
KN6/JS My perceptions of the nursing profession were accurate.						
KN7/JS I have the knowledge I need to practice nursing.						
KN19/JS My workplace is invested in my ongoing learning.						
KN11 The nurses I work with have realistic expectations of me.						
KN10 The Nurse Manager has realistic expectations of me.						
KN11 The Patient Care Coordinator/Charge Nurse has realistic expectations of me.						
KN12 I have realistic expectations of myself.						
KN13 I understand the stages of professional role transition.						
KN14 I understand what transition shock is.						

Appendix D

Clinical case scenarios

Medicine-Surg Clinical Scenario 1

Female in her late 40's admitted with Crohn's flare up with bloody diarrhea. History of autoimmune hepatitis with PSC (primary sclerosing cholangitis) overlap. She is admitted under GI service.

History

Pt reported having 16 bloody BMs the day before, has questions for the team. History of central venous sinus thrombosis in 2010 and is known to the thrombosis team, history of anemia

Vitals: BP 110/76, p. 81, temp 37.5 (has been ranging from 37.2, 36.9, 37.5), sats 94% on RA

Labs:

Results from last 7 days

Lab	Units	10/05/21 1018	09/05/21 0824
Na	mmol/L	137	136
K	mmol/L	**3.2***	3.7
Mg	mmol/L	0.76	--
Creatinine	umol/L	54	60

LFTs:

Results from last 7 days

Lab	Units	09/05/21 0824
Bilirubin Total	umol/L	10
AST	U/L	**50***
ALT	U/L	**56***
Lipase	U/L	**13***

PT 27.1, INR 2.5, APTT 36, ESR 50, CRP 49.9, C.diff negative

Further investigative tests

Tests:

CT abdomen: Bowel wall thickening and mucosal hyperenhancement of the ascending and transverse colon as well as the terminal ileum involvement. Findings are most in keeping with flare of known Crohn's disease. No evidence of ischemia, obstruction or perforation. Dilated irregular intrahepatic bile ducts in keeping with known PSC.

What are the Outstanding Issues an anticipated plan of treatment typical for such scenarios:

Medicine-Surg Clinical Scenario 2

72-year-old known with history of rectal cancer for which she underwent radiation and chemotherapy. Her chemotherapy was stopped due to concerns with perforated tumor needing permanent colostomy. Her admission for abdominal perineal resection (APR) POD 4 has been complicated by respiratory failure secondary to mucous plugging needing ICU for bronchoscopy and bowel obstruction.

History

VSS, sats 89% RA, temp. She is feeling okay, throat feels sticky, draining moderate amount in perineal area, colostomy is pink and looks healthy, NG, urine output was not accurately measured. Complained of left flank pain, has not been able to tolerate food sufficiently due to nausea and vomiting. The team is concerned about deconditioning.

Concerns:

Tests/consults:

Biochemical Data / Medical Tests & Procedures:

Electrolyte and renal profile:

Results from last 7 days

Lab	Units	04/10/21 1010	03/10/21 0603	02/10/21 0542	02/10/21 0542
Na	mmol/L	138	138	--	142
K	mmol/L	**3.4***	**3.3***	--	3.7
Cl	mmol/L	100	103	--	106

Urea	mmol/L	5.8	5.5	--	4.9
Creatinine	umol/L	54	**45***	49	49
PO4	mmol/L	1.22	1.07	1.15	1.13
Mg	mmol/L	0.74	0.72	0.83	0.78
Ca	mmol/L	**2.10***	**1.95***	**2.07***	**2.03***
Albumin	g/L	**30***	**24***	--	**24***

Procedures and Tests: Mild pulmonary interstitial edema. Trace bilateral pleural effusions. Stable cardio-mediastinal silhouette with calcified tortuous aorta. There is a mildly prominent distal small bowel with air-fluid levels which could be due to ileus. No findings for obstruction. Degenerative changes of the spine and pelvis. Postoperative changes right hip

After a few days:

She is passing gas and stool via colostomy, had a PICC line inserted but fell out shortly after, appetite is poor but feels nauseous, still experiences some abdominal pain, dietician feels she is severely malnourished with ongoing rapid weight loss of 4.8 kg in one week. Sutures insitu. Inadequate oral intake. She agrees to drinking supplemental drinks and small frequent meals otherwise PPN. Urology consulted for flank pain.

Oncology Scenario

John is a 60-year-old male, history of gall bladder invasive cholangiocarcinoma earlier this year and had chemotherapy. He is admitted with recurrent fevers, rigors, fluctuant episodes of cognitive decline and confusion, intermittent expressive aphasia, decreased appetite, but drinking well. He has been started on Keppra.

What stands out for you in this scenario?

What diagnostic tests come to mind to effectively explore and manage John's treatment? Consult teams?

Further:

He has been ordered brain MRI, EEG, TTE, TEE, CBC, Lytes including liver function tests, The team rounds on pt, the following problem list were identified:

- infective or marantic endocarditis
- Fever and neurologic symptoms
- Elevated bilirubin

he was also started on vancomycin in addition to moxifloxacin.

6W - **Rad Oncology**

64-year-old woman with squamous cell carcinoma of right larynx, previously on chemo. Initially admitted to radiation oncology (August) with worsening airway edema causing narrowing at the level of the laryngeal tumor and symptomatic hiatal hernia (chemo-induced nausea/vomiting). Readmitted with nausea/vomiting and inability to maintain oral intake. NG inserted. Pain especially with swallowing, voice is hoarse. Plan of treatment is for pt. to return home. She has been successfully shown how to use the CADD pump upon discharge and is independent with feeds.

What stands out to you?

What tests, consults do you think would effectively manage her care, what treatment goals, meds do you anticipate for inclusion with her care?

WBC = 3.0, neutrophils = 1.8, hemoglobin = 113, platelets = 317 K

Results from last 7 days

Lab	Units	28/09/21 0700
WBC	x10^9/L	**3.0***
HGB	g/L	**113***
HCT	L/L	**0.351***
Neutrophil	x10^9/L	**1.8***
Na	mmol/L	136
K	mmol/L	4.2
Cl	mmol/L	98
CO2	mmol/L	28
Creatinine	umol/L	53
Mg	mmol/L	0.84
Ca	mmol/L	2.36
PO4	mmol/L	1.01
Albumin	g/L	**34***

F7: Neuro surgery

23-year-old male, admitted for TBI (traumatic brain injury) from a fall and developed an epidural hematoma, was taken to the OR urgently for decompressive craniectomy. TBI (traumatic brain injury), Trauma, Fever, Seizure, Tachycardia, Skull defect. Had emergency right craniectomy with VP (ventricular peritoneal) shunt. Periods of fever especially overnight and decreased LOC (slow to speak but oriented). Glasgow coma scale of 15.

What aspects stands out to you? Any other relevant diagnostic tests or consults?

Temp:	37.5 °C (99.5 °F)	37.7 °C (99.9 °F)	38.1 °C (100.6 °F)	37.2 °C (99 °F)

Results from last 7 days

Lab	Units	03/10/21 0957	29/09/21 2104
WBC	x10^9/L	9.8	**11.2***
HGB	g/L	**96***	**100***
Plat	x10^9/L	**469***	**452***
Na	mmol/L	138	136
K	mmol/L	4.0	4.1
Creatinine	umol/L	**38***	**35***
Mg	mmol/L	--	0.84
PO4	mmol/L	--	1.04
Ca	mmol/L	--	2.38
Albumin	g/L	--	**40***

ICU Scenario 1

69-year-old, admitted into ICU for transperitoneal repair of ruptured abdominal aortic aneurysm (AAA). He is sedated and intubated, becomes hypertensive and agitated at times, abdomen distended, incision healing and sutures are in place. He has a history of diabetes, HTN, dyslipidemia and chronic pain. While in the OR, he underwent a total of 2000cc blood loss, and massive transfusion (11 PRBC, 10u FFP, 3u platelets, 3L of crystalloid)

What stands out to you and what would you plan or this pt. to effectively monitor and manage their treatment, consult teams?

Next day: noted pt. had an ileus, desaturated and became tachypneic and hypertensive. Had a subsequent bronchoscopy and was consistent with aspiration pneumonia, CT showed PE right upper lobe. What stands out/clinical problems? What treatments/consults

ICU Scenario 2

79M trucker, he was found unconscious in his truck with Temp 27 and glucose 1. Initial vitals 50/30, Sats unreliable but 70-80s. Initial gas lactate 19 and pH < 7. Had seizure enroute to the ICU, he had runs of Vtach which was aborted by cardioversion.

Labs & assessment:

Intubated, sedated, unresponsive. 5 mm unresponsive pupils. BP 130/80, HR 90 on norepi 45, epi 45, phenyl 200. SpO2 100% on FiO2 100%. VAC 26x450, PEEP 8.

Mottled over knees, cold. Feet both purple. Ischemic ulcer over lateral aspect of left calf. Abdomen soft, no rebound. No edema.

Severely reduced LV function, moderately reduced RV function. Aortic valve calcified with restricted motion. No pericardial effusion. No consolidation. Left pleural effusion vs ascites (fluid seems below diaphragm).

Lab Results

ABG 6.9/36/387/8, lactate 20, glucose undetectable (high), K 4.3

Leuks 16, Hb 90, Plt 180. INR 3.4, PTT 53, DDimer > 10000. K 7.1, Creat 364, lactate 19, CK 7000

ECG: Afib 85 BPM, ST depression V3-V6. No ST elevation. QT long 550.

400 mL of urine initially drained, but anuric since

What stands out to you, treatment and consults?

Appendix E

Cycle one demographic and survey response

	3 months (N=22)	4 months (N=31)	Total (N=53)
	Employment status		
Full time	14 (63.6%)	16 (51.6%)	30 (56.6%)
Part time	8 (36.4%)	14 (45.2%)	22 (41.5%)
Casual	0 (0.0%)	1 (3.2%)	1 (1.9%)
	Gender		
Man	0 (0.0%)	2 (6.5%)	2 (3.8%)
Woman	22 (100%)	28 (90.3%)	50 (94.3%)
Non-Binary	0 (0.0%)	1 (3.2%)	1 (1.9%)
	Specialty of work (work area)		
Medicine	8 (36.4%)	17 (54.8%)	25 (47.2%)
Surgery	4 (18.2%)	8 (25.8%)	12 (22.6%)
Vascular/Trauma	2 (9.1%)	1 (3.2%)	3 (5.7%)
Other	8 (36.4%)	5 (16.1%)	13 (24.5%)
	Age group		
20-30	20 (90.9%)	23(74.2%)	43 (81.1%)
30-40	2 (9.1%)	5 (16.1%)	7 (13.2%)
40-50	0 (0.0%)	3 (9.7%)	3 (5.7%)
	Ethnicity		
Arab	3 (13.6%)	0 (0.0%)	3 (5.7%)
Black	1 (4.5%)	3 (9.7%)	4 (7.5%)
Chinese	1 (4.5%)	3 (9.7%)	4 (7.5%)
Filipino	3 (13.6%)	2 (6.5%)	5 (9.4%)
South/southern/West Asia	2 (9.1%)	6 (19.4%)	8 (15.1%)
White	12 (54.4%)	17 (54.8%)	29 (54.7%)

Survey Responses:

Responsibility

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
as.factor(undersR)				0.713
- Agree	11 (50.0%)	12 (38.7%)	23 (43.4%)	
- Neutral	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Strongly Agree	10 (45.5%)	17 (54.8%)	27 (50.9%)	
- strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
as.factor(leavingWP)				0.562
- Agree	6 (27.3%)	15 (48.4%)	21 (39.6%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Disagree	9 (40.9%)	7 (22.6%)	16 (30.2%)	
- Neutral	2 (9.1%)	3 (9.7%)	5 (9.4%)	
- Strongly Agree	4 (18.2%)	5 (16.1%)	9 (17.0%)	
- strongly Disagree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
as.factor(confidentCP)				0.178
- Agree	11 (50.0%)	16 (51.6%)	27 (50.9%)	
- Disagree	2 (9.1%)	0 (0.0%)	2 (3.8%)	
- Neutral	5 (22.7%)	4 (12.9%)	9 (17.0%)	
- Strongly Agree	4 (18.2%)	11 (35.5%)	15 (28.3%)	
as.factor(confidentCN)				0.194
- Agree	11 (50.0%)	8 (25.8%)	19 (35.8%)	
- Neutral	1 (4.5%)	2 (6.5%)	3 (5.7%)	
- Strongly Agree	10 (45.5%)	21 (67.7%)	31 (58.5%)	
as.factor(confidentCD)				0.607
- Agree	9 (40.9%)	12 (38.7%)	21 (39.6%)	
- Disagree	2 (9.1%)	1 (3.2%)	3 (5.7%)	
- Neutral	6 (27.3%)	12 (38.7%)	18 (34.0%)	
- Strongly Agree	4 (18.2%)	6 (19.4%)	10 (18.9%)	
- strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(confidentWD)				0.388
- Agree	12 (54.5%)	18 (58.1%)	30 (56.6%)	
- Neutral	5 (22.7%)	3 (9.7%)	8 (15.1%)	
- Strongly Agree	5 (22.7%)	10 (32.3%)	15 (28.3%)	
as.factor(respondNC)				0.039
- Agree	16 (72.7%)	17 (54.8%)	33 (62.3%)	
- Neutral	4 (18.2%)	2 (6.5%)	6 (11.3%)	
- Strongly Agree	2 (9.1%)	12 (38.7%)	14 (26.4%)	
as.factor(partSC)				0.523
- Agree	11 (50.0%)	13 (41.9%)	24 (45.3%)	
- Disagree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Neutral	6 (27.3%)	9 (29.0%)	15 (28.3%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	2 (9.1%)	7 (22.6%)	9 (17.0%)	
- strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(confuseSN)				0.740
- Agree	7 (31.8%)	6 (19.4%)	13 (24.5%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Disagree	11 (50.0%)	15 (48.4%)	26 (49.1%)	
- Neutral	3 (13.6%)	5 (16.1%)	8 (15.1%)	
- Not Applicable	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- strongly Disagree	1 (4.5%)	3 (9.7%)	4 (7.5%)	
as.factor(confidentJD)				0.179
- Agree	10 (45.5%)	17 (54.8%)	27 (50.9%)	
- Disagree	1 (4.5%)	3 (9.7%)	4 (7.5%)	
- Neutral	11 (50.0%)	8 (25.8%)	19 (35.8%)	
- Strongly Agree	0 (0.0%)	3 (9.7%)	3 (5.7%)	
as.factor(thinkWO)				0.767
- Agree	13 (59.1%)	14 (45.2%)	27 (50.9%)	
- Disagree	1 (4.5%)	3 (9.7%)	4 (7.5%)	
- Neutral	2 (9.1%)	4 (12.9%)	6 (11.3%)	
- Strongly Agree	6 (27.3%)	9 (29.0%)	15 (28.3%)	
- strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
as.factor(confidentCF)				0.388
- Agree	10 (45.5%)	14 (45.2%)	24 (45.3%)	
- Disagree	3 (13.6%)	2 (6.5%)	5 (9.4%)	
- Neutral	6 (27.3%)	7 (22.6%)	13 (24.5%)	
- Strongly Agree	2 (9.1%)	8 (25.8%)	10 (18.9%)	
- strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(confidentPI)				0.237
- Agree	13 (59.1%)	16 (51.6%)	29 (54.7%)	
- Disagree	1 (4.5%)	3 (9.7%)	4 (7.5%)	
- Neutral	6 (27.3%)	5 (16.1%)	11 (20.8%)	
- Strongly Agree	1 (4.5%)	7 (22.6%)	8 (15.1%)	
- strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	

Role

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
as.factor(understandOE)				0.572
- Agree	15 (68.2%)	19 (61.3%)	34 (64.2%)	
- Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Neutral	5 (22.7%)	10 (32.3%)	15 (28.3%)	
- Strongly Agree	1 (4.5%)	2 (6.5%)	3 (5.7%)	
as.factor(questionedMD)				0.109

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Agree	10 (45.5%)	11 (35.5%)	21 (39.6%)	
- Disagree	1 (4.5%)	7 (22.6%)	8 (15.1%)	
- Neutral	7 (31.8%)	5 (16.1%)	12 (22.6%)	
- Strongly Disagree	0 (0.0%)	4 (12.9%)	4 (7.5%)	
- Strongly Agree	4 (18.2%)	4 (12.9%)	8 (15.1%)	
as.factor(understandDR)				0.470
- Agree	10 (45.5%)	12 (38.7%)	22 (41.5%)	
- Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Neutral	2 (9.1%)	4 (12.9%)	6 (11.3%)	
- Strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	8 (36.4%)	15 (48.4%)	23 (43.4%)	
as.factor(understandDN)				0.618
- Not Applicable	1 (4.5%)	2 (6.5%)	3 (5.7%)	
- Agree	13 (59.1%)	14 (45.2%)	27 (50.9%)	
- Disagree	0 (0.0%)	3 (9.7%)	3 (5.7%)	
- Neutral	3 (13.6%)	5 (16.1%)	8 (15.1%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	5 (22.7%)	6 (19.4%)	11 (20.8%)	
as.factor(understandDC)				0.210
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Agree	11 (50.0%)	17 (54.8%)	28 (52.8%)	
- Neutral	2 (9.1%)	0 (0.0%)	2 (3.8%)	
- Strongly Agree	8 (36.4%)	14 (45.2%)	22 (41.5%)	
as.factor(leadership)				0.748
- Not Applicable	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Agree	2 (9.1%)	7 (22.6%)	9 (17.0%)	
- Disagree	7 (31.8%)	7 (22.6%)	14 (26.4%)	
- Neutral	11 (50.0%)	14 (45.2%)	25 (47.2%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
as.factor(respectedNW)				0.799
- Agree	13 (59.1%)	21 (67.7%)	34 (64.2%)	
- Disagree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Neutral	5 (22.7%)	4 (12.9%)	9 (17.0%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	3 (13.6%)	4 (12.9%)	7 (13.2%)	
as.factor(respectedCW)				0.630

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Agree	12 (54.5%)	18 (58.1%)	30 (56.6%)	
- Disagree	2 (9.1%)	2 (6.5%)	4 (7.5%)	
- Neutral	4 (18.2%)	6 (19.4%)	10 (18.9%)	
- No Response	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	2 (9.1%)	5 (16.1%)	7 (13.2%)	
as.factor(respectedPW)				0.853
- Agree	12 (54.5%)	14 (45.2%)	26 (49.1%)	
- Disagree	2 (9.1%)	4 (12.9%)	6 (11.3%)	
- Neutral	6 (27.3%)	11 (35.5%)	17 (32.1%)	
- Strongly Agree	2 (9.1%)	2 (6.5%)	4 (7.5%)	
as.factor (balancePW)				0.242
- Agree	11 (50.0%)	8 (25.8%)	19 (35.8%)	
- Disagree	3 (13.6%)	3 (9.7%)	6 (11.3%)	
- Neutral	7 (31.8%)	13 (41.9%)	20 (37.7%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	6 (19.4%)	7 (13.2%)	
as.factor (nurseR)				0.146
- Agree	9 (40.9%)	14 (45.2%)	23 (43.4%)	
- Disagree	6 (27.3%)	2 (6.5%)	8 (15.1%)	
- Neutral	6 (27.3%)	10 (32.3%)	16 (30.2%)	
- Strongly Agree	1 (4.5%)	5 (16.1%)	6 (11.3%)	
as.factor (Moving SN)				0.193
- Not Applicable	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Agree	7 (31.8%)	4 (12.9%)	11 (20.8%)	
- Disagree	7 (31.8%)	9 (29.0%)	16 (30.2%)	
- Neutral	5 (22.7%)	12 (38.7%)	17 (32.1%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Disagree	0 (0.0%)	3 (9.7%)	3 (5.7%)	
- Strongly Agree	3 (13.6%)	1 (3.2%)	4 (7.5%)	

Relationship

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
as.factor(seenLW)				0.029
- Agree	5 (22.7%)	1 (3.2%)	6 (11.3%)	
- Disagree	11 (50.0%)	9 (29.0%)	20 (37.7%)	
- Neutral	3 (13.6%)	14 (45.2%)	17 (32.1%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Not Applicable	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Disagree	3 (13.6%)	6 (19.4%)	9 (17.0%)	
as.factor(acceptedNW)				0.774
- Agree	13 (59.1%)	19 (61.3%)	32 (60.4%)	
- Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Neutral	3 (13.6%)	4 (12.9%)	7 (13.2%)	
- Strongly Agree	6 (27.3%)	6 (19.4%)	12 (22.6%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
as.factor(acceptedHA)				0.750
- Agree	13 (59.1%)	19 (61.3%)	32 (60.4%)	
- Disagree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Neutral	4 (18.2%)	4 (12.9%)	8 (15.1%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	3 (13.6%)	6 (19.4%)	9 (17.0%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
as.factor(acceptedPW)				0.847
- Agree	15 (68.2%)	20 (64.5%)	35 (66.0%)	
- Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Neutral	6 (27.3%)	9 (29.0%)	15 (28.3%)	
- Strongly Agree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
as.factor(reportPC)				0.746
- Agree	12 (54.5%)	19 (61.3%)	31 (58.5%)	
- Disagree	3 (13.6%)	5 (16.1%)	8 (15.1%)	
- Neutral	5 (22.7%)	5 (16.1%)	10 (18.9%)	
- Strongly Agree	1 (4.5%)	2 (6.5%)	3 (5.7%)	
- Strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(safeRP)				0.677
- Agree	12 (54.5%)	18 (58.1%)	30 (56.6%)	
- Disagree	2 (9.1%)	1 (3.2%)	3 (5.7%)	
- Neutral	7 (31.8%)	9 (29.0%)	16 (30.2%)	
- Strongly Agree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Strongly Disagree	0 (0.0%)	2 (6.5%)	2 (3.8%)	
as.factor(bullyingWP)				0.617
- Agree	4 (18.2%)	5 (16.1%)	9 (17.0%)	
- Disagree	9 (40.9%)	10 (32.3%)	19 (35.8%)	
- Neutral	1 (4.5%)	4 (12.9%)	5 (9.4%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	4 (12.9%)	5 (9.4%)	
- Strongly Disagree	6 (27.3%)	7 (22.6%)	13 (24.5%)	
as.factor(bullyingNM)				0.577
- Disagree	10 (45.5%)	11 (35.5%)	21 (39.6%)	
- Neutral	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Disagree	10 (45.5%)	18 (58.1%)	28 (52.8%)	
as.factor(bullyingCN)				0.481
- Agree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Disagree	9 (40.9%)	8 (25.8%)	17 (32.1%)	
- Neutral	0 (0.0%)	3 (9.7%)	3 (5.7%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Strongly Disagree	10 (45.5%)	17 (54.8%)	27 (50.9%)	
as.factor(bullyingP)				0.783
- Agree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Disagree	11 (50.0%)	14 (45.2%)	25 (47.2%)	
- Neutral	2 (9.1%)	4 (12.9%)	6 (11.3%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Disagree	7 (31.8%)	11 (35.5%)	18 (34.0%)	
as.factor(bullyingCA)				0.219
- Agree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Disagree	9 (40.9%)	14 (45.2%)	23 (43.4%)	
- Neutral	5 (22.7%)	1 (3.2%)	6 (11.3%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Disagree	7 (31.8%)	13 (41.9%)	20 (37.7%)	
as.factor(approachingNM)				0.461
- Agree	14 (63.6%)	12 (38.7%)	26 (49.1%)	
- Disagree	1 (4.5%)	2 (6.5%)	3 (5.7%)	
- Neutral	2 (9.1%)	4 (12.9%)	6 (11.3%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Strongly Agree	5 (22.7%)	12 (38.7%)	17 (32.1%)	
as.factor(approachingCN)				0.742
- Agree	11 (50.0%)	12 (38.7%)	23 (43.4%)	
- Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Neutral	2 (9.1%)	4 (12.9%)	6 (11.3%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	9 (40.9%)	13 (41.9%)	22 (41.5%)	
as.factor(approachingNE)				0.572
- Agree	8 (36.4%)	10 (32.3%)	18 (34.0%)	
- Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Neutral	1 (4.5%)	4 (12.9%)	5 (9.4%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	12 (54.5%)	14 (45.2%)	26 (49.1%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
as.factor(approachingM)				0.089
- Agree	8 (36.4%)	9 (29.0%)	17 (32.1%)	
- Neutral	2 (9.1%)	7 (22.6%)	9 (17.0%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	8 (36.4%)	3 (9.7%)	11 (20.8%)	
- Strongly Agree	4 (18.2%)	11 (35.5%)	15 (28.3%)	
as.factor(approachingSN)				0.927
- Agree	10 (45.5%)	14 (45.2%)	24 (45.3%)	
- Disagree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Neutral	3 (13.6%)	2 (6.5%)	5 (9.4%)	
- No Response	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Strongly Agree	6 (27.3%)	12 (38.7%)	18 (34.0%)	
- Strongly Disagree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
as.factor(nursePS)				0.582
- Agree	13 (59.1%)	14 (45.2%)	27 (50.9%)	
- Disagree	2 (9.1%)	2 (6.5%)	4 (7.5%)	
- Neutral	6 (27.3%)	9 (29.0%)	15 (28.3%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	5 (16.1%)	6 (11.3%)	
as.factor(welcomeWP)				0.384
- Agree	14 (63.6%)	14 (45.2%)	28 (52.8%)	
- Disagree	0 (0.0%)	2 (6.5%)	2 (3.8%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Neutral	4 (18.2%)	4 (12.9%)	8 (15.1%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	4 (18.2%)	10 (32.3%)	14 (26.4%)	
as.factor(nurse)				0.263
- Disagree	11 (50.0%)	11 (35.5%)	22 (41.5%)	
- Neutral	7 (31.8%)	7 (22.6%)	14 (26.4%)	
- No Response	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Strongly Disagree	3 (13.6%)	12 (38.7%)	15 (28.3%)	
as.factor(workplaceRS)				0.639
- Agree	10 (45.5%)	15 (48.4%)	25 (47.2%)	
- Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Neutral	7 (31.8%)	8 (25.8%)	15 (28.3%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	2 (9.1%)	1 (3.2%)	3 (5.7%)	
- Strongly Agree	2 (9.1%)	5 (16.1%)	7 (13.2%)	
- Strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	

Knowledge

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
as.factor(educationPP)				0.724
- Agree	12 (54.5%)	15 (48.4%)	27 (50.9%)	
- Disagree	2 (9.1%)	3 (9.7%)	5 (9.4%)	
- Neutral	6 (27.3%)	6 (19.4%)	12 (22.6%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	2 (9.1%)	6 (19.4%)	8 (15.1%)	
as.factor(confidentPS)				0.612
- Agree	15 (68.2%)	21 (67.7%)	36 (67.9%)	
- Disagree	2 (9.1%)	1 (3.2%)	3 (5.7%)	
- Neutral	4 (18.2%)	4 (12.9%)	8 (15.1%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	4 (12.9%)	5 (9.4%)	
as.factor(confidentCC)				0.133

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Agree	11 (50.0%)	9 (29.0%)	20 (37.7%)	
- Disagree	3 (13.6%)	2 (6.5%)	5 (9.4%)	
- Neutral	7 (31.8%)	14 (45.2%)	21 (39.6%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	0 (0.0%)	5 (16.1%)	5 (9.4%)	
- Strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(confidentRC)				0.584
- Agree	15 (68.2%)	18 (58.1%)	33 (62.3%)	
- Disagree	1 (4.5%)	3 (9.7%)	4 (7.5%)	
- Neutral	4 (18.2%)	5 (16.1%)	9 (17.0%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	4 (12.9%)	5 (9.4%)	
- Strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(confidentTC)				0.218
- Agree	16 (72.7%)	17 (54.8%)	33 (62.3%)	
- Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Neutral	5 (22.7%)	7 (22.6%)	12 (22.6%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	0 (0.0%)	5 (16.1%)	5 (9.4%)	
- Strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(perceptNP)				0.251
- Agree	7 (31.8%)	18 (58.1%)	25 (47.2%)	
- Disagree	5 (22.7%)	4 (12.9%)	9 (17.0%)	
- Neutral	7 (31.8%)	7 (22.6%)	14 (26.4%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	1 (3.2%)	2 (3.8%)	
- Strongly Disagree	2 (9.1%)	0 (0.0%)	2 (3.8%)	
as.factor(knowPN)				0.596
- Agree	14 (63.6%)	22 (71.0%)	36 (67.9%)	
- Disagree	3 (13.6%)	1 (3.2%)	4 (7.5%)	
- Neutral	4 (18.2%)	5 (16.1%)	9 (17.0%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	1 (4.5%)	2 (6.5%)	3 (5.7%)	
as.factor(workplaceIL)				0.518
- Agree	11 (50.0%)	12 (38.7%)	23 (43.4%)	
- Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Neutral	6 (27.3%)	11 (35.5%)	17 (32.1%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	0 (0.0%)	2 (6.5%)	2 (3.8%)	
- Strongly Agree	4 (18.2%)	5 (16.1%)	9 (17.0%)	
as.factor(nursesRE)				0.701
- Agree	14 (63.6%)	21 (67.7%)	35 (66.0%)	
- Neutral	3 (13.6%)	4 (12.9%)	7 (13.2%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	5 (22.7%)	4 (12.9%)	9 (17.0%)	
- Strongly Disagree	0 (0.0%)	1 (3.2%)	1 (1.9%)	
as.factor(managerRE)				0.403
- Agree	11 (50.0%)	18 (58.1%)	29 (54.7%)	
- Disagree	0 (0.0%)	2 (6.5%)	2 (3.8%)	
- Neutral	6 (27.3%)	4 (12.9%)	10 (18.9%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	4 (18.2%)	6 (19.4%)	10 (18.9%)	
as.factor(chargeNRE)				0.406
- Agree	11 (50.0%)	20 (64.5%)	31 (58.5%)	
- Neutral	6 (27.3%)	4 (12.9%)	10 (18.9%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Not Applicable	1 (4.5%)	0 (0.0%)	1 (1.9%)	
- Strongly Agree	4 (18.2%)	6 (19.4%)	10 (18.9%)	
as.factor(realEM)				0.701
- Agree	12 (54.5%)	21 (67.7%)	33 (62.3%)	
- Disagree	2 (9.1%)	2 (6.5%)	4 (7.5%)	
- Neutral	5 (22.7%)	5 (16.1%)	10 (18.9%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	3 (13.6%)	2 (6.5%)	5 (9.4%)	
as.factor(stagesPRT)				0.619
- Agree	12 (54.5%)	13 (41.9%)	25 (47.2%)	
- Disagree	3 (13.6%)	4 (12.9%)	7 (13.2%)	
- Neutral	4 (18.2%)	10 (32.3%)	14 (26.4%)	
- No Response	0 (0.0%)	1 (3.2%)	1 (1.9%)	
- Strongly Agree	2 (9.1%)	3 (9.7%)	5 (9.4%)	
- Strongly Disagree	1 (4.5%)	0 (0.0%)	1 (1.9%)	
as.factor(transitionS)				0.814
- Agree	7 (31.8%)	11 (35.5%)	18 (34.0%)	

	1-3 months (N=22)	4-6 months (N=31)	Total (N=53)	p value
- Disagree	8 (36.4%)	6 (19.4%)	14 (26.4%)	
- Neutral	3 (13.6%)	6 (19.4%)	9 (17.0%)	
- No Response	1 (4.5%)	3 (9.7%)	4 (7.5%)	
- Strongly Agree	2 (9.1%)	3 (9.7%)	5 (9.4%)	
- Strongly Disagree	1 (4.5%)	2 (6.5%)	3 (5.7%)	

Appendix F

Cycle Two demographic and survey response

	11 months (N=10)	12 months (N=25)	Total (N=35)
	Employment status		*0.490*
Full time	6 (60%)	18 (72%)	24 (68.6%)
Part time	4 (40%)	7 (28%)	11 (31.4%)
Casual	0 (0.0%)	0 (0%)	0 (0%)
	Gender		*0.231*
Man	1 (10.0%)	0 (0.0%)	1 (2.9%)
Woman	9 (90%)	24 (96%)	33 (94.3%)
Non-Binary	0 (0.0%)	1 (4.0%)	1 (2.9%)
	Specialty of work (work area)		*0.571*
Medicine	4 (40.0%)	9 (36.0%)	13 (37.1%)
Surgery	3 (30.0%)	4 (16.0%)	7 (20.0%)
Vascular/Trauma	0 (0.0%)	3 (12.0%)	3 (8.6%)
Other	3 (30.0%)	9 (36.0%)	12 (34.3%)
	Age group		*0.103*
20-30	6 (60.0%)	22 (88.0%)	28 (80.0%)
30-40	3 (30.0%)	3 (12.0%)	6 (17.1%)
40-50	1 (10.0%)	0 (0.0%)	1 (2.9%)
	Ethnicity		*0.229*
Arab	0 (0.0%)	1 (4.0%)	1(2.9%)
Black	1 (11.1%)	2 (8.0%)	3 (8.8%)
Chinese	2 (22.2%)	1 (4.0%)	3 (8.8%)
Filipino	1 (11.1%)	2 (8.0%)	3 (8.8%)
South/southern/West Asia	3 (33.3%)	3 (12.0%)	6 (17.6%)
White	2 (22.2%)	16 (64.0%)	18 (52.9%)

Survey responses

Responsibility

Responsibility	11 months (n=25)	12 months (n=10)	Total (n=35)
as.factor(undersR)			*0.794*
Strongly agree	13 (52%)	5 (50%)	18 (51.4%)
Agree	11 (44.0%)	5 (50.0%)	16 (45.7%)
Neutral	0 (0.0%)	0(0.0%)	0 (0.0%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)

Strongly Disagree	1 (4%)	0(0.0%)	
as.factor(leavingWP)			*0.054*
Strongly agree	7 (28%)	6 (60%)	13 (37.1)
Agree	14 (56%)	1 (10%)	15 (42.9%)
Neutral	3 (12%)	1 (10%)	4 (11.4%)
Disagree	1 (4%)	2 (20%)	3 (8.6%)
Strongly disagree	0(0.0%)	0(0.0%)	0(0.0%)
as.factor(confidentCP)			*0.355*
Strongly agree	10 (40%)	6 (60%)	16 (45.7%)
Agree	14 (56%)	3 (30%)	17 (48.6%)
Neutral	1 (4%)	1 (10%)	2 (5.7%)
Disagree	0(0.0%)	0(0.0%)	0(0.0%)
Strongly disagree	0(0.0%)	0(0.0%)	0(0.0%)
as.factor(confidentCN)			*0.076*
Strongly agree	20 (80%)	5 (50%)	25 (71.4%)
Agree	5 (20%)	5 (50%)	10 (28.6%)
Neutral	0(0.0%)	0(0.0%)	0(0.0%)
Disagree	0(0.0%)	0(0.0%)	0(0.0%)
Strongly disagree	0(0.0%)	0(0.0%)	0(0.0%)
as.factor(confidentCD)			*0.244*
Strongly agree	10 (40%)	3 (30%)	13 (37.1%)
Agree	13 (52%)	4 (40%)	17 (48.6%)
Neutral	2 (8.0%)	3 (30%)	5 (14.3%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(confidentWD)			*0.668*
Strongly agree	12 (48%)	4 (40%)	16 (45.7%)

Agree	13 (52%)	6 (60%)	19 (54.3%)
Neutral	0 (0.0%)	0 (0.0%)	0 (0.0%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(respondNC)			*0.408*
Strongly agree	8 (32%)	5 (50%)	13 (37.1%)
Agree	16 (64%)	4 (40%)	20 (57.1%)
Neutral	1 (4%)	1 (10%)	2 (5.7)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(partSC)			*0.091*
Strongly agree	8 (32%)	1 (11.1%)	9 (26.5%)
Agree	10 (40%)	2 (22%)	12 (35.3%)
Neutral	5 (20%)	5 (55.6%)	10 (29.4%)
Disagree	2 (8%)	0 (0.0%)	2 (5.9%)
Strongly disagree	0 (0.0%)	1 (11.1%)	1 (2.9%)
Missing data	0	1	1
as.factor(confuseSN)			*0.029*
Strongly agree	0 (0.0%)	0 (0.0%)	
Agree	2 (8%)	0 (0.0%)	
Neutral	0 (0.0%)	0 (0.0%)	
Disagree	19 (76%)	4 (40%)	
Strongly disagree	4 (16%)	6 (60%)	
as.factor(confidentJD)			*0.690*
Strongly agree	3 (12%)	2 (20%)	5 (14.3%)
Agree	17 (68%)	7 (70%)	24 (68.6%)

Neutral	5 (20%)	1 (10%)	6 (17.1%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(thinkWO)			0.028
Strongly agree	9 (36%)	3 (30%)	12 (34.3%)
Agree	1 (10%)	11 (44%)	12 (34.3%)
Neutral	2 (8%)	2 (20%)	4 (11.4%)
Disagree	3 (12%)	1 (10%)	4 (11.4%)
Strongly disagree	0 (0.0%)	3 (30%)	3 (8.6%)
as.factor(confidentCF)			*0.973*
Strongly agree	3 (12%)	1 (10%)	4 (11.4%)
Agree	14 (56%)	6 (60%)	20 (57.1%)
Neutral	8 (32%)	3 (30%)	11 (31.4%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(confidentPI)			*0.296*
Strongly agree	5 (20%)	2 (20%)	7 (20%)
Agree	15 (60%)	8 (80%)	23 (65.7%)
Neutral	5 (20%)	0 (0.0%)	5 (14.3%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)

Role

Role	11 months (n=25)	12 months (n=10)	Total (n=35)
as.factor(understanOE)			*0.311*
Strongly agree	6 (24.0%)	3 (30.0%)	9 (25.7%)
Agree	18 (72.0%)	5 (50.0%)	23 (65.7%)

Neutral	1 (4.0%)	1 (10.0%)	2 (5.7%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly Disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(questionMD)			*0.538*
Strongly agree	5 (20.0%)	3 (30.0%)	8 (22.9%)
Agree	14 (56.0%)	4 (40.0%)	18 (51.4%)
Neutral	2 (8.0%)	0 (0.0%)	2 (5.7%)
Disagree	4 (16.0%)	3 (30.0%)	7 (20.0%)
Strongly disagree	0(0.0%)	0(0.0%)	0(0.0%)
as.factor(understanDR)			*0.737*
Strongly agree	15 (62.5%)	5 (50.0%)	20 (58.8%)
Agree	7 (29.2%)	4 (40.0%)	11 (32.4%)
Neutral	1 (4.2%)	1 (10.0%)	2 (5.9%)
Disagree	1 (4.2%)	0(0.0%)	1 (2.9%)
Strongly disagree	0(0.0%)	0(0.0%)	0(0.0%)
Unanswered	1	0	1
as.factor(understanDN)			*0.290*
Strongly agree	4 (16.0%)	1 (10.0%)	5 (14.3%)
Agree	15 (60.0%)	5 (50.0%)	20 (57.1%)
Neutral	2 (8.0%)	4 (40.0%)	6 (17.1%)
Disagree	2 (8.0%)	0(0.0%)	2 (5.7%)
Strongly disagree	1 (4.0%)	0(0.0%)	1 (2.9%)
Not applicable	1 (4.0%)	0(0.0%)	1 (2.9%)
as.factor(understanDC)			*0.319*
Strongly agree	17 (68.0%)	5 (50.0%)	22 (62.9%)
Agree	8 (32.0%)	5 (50.0%)	13 (37.1%)

Neutral	0 (0.0%)	0 (0.0%)	0 (0.0%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(leadership)			*0.586*
Strongly agree	2 (8.0%)	0 (0.0%)	2 (5.7%)
Agree	9 (36.0%)	2 (20.0%)	11 (31.4%)
Neutral	9 (36.0%)	5 (50.0%)	14 (40.0%)
Disagree	4 (16.0%)	3 (30.0%)	7 (20.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Not applicable	1 (4.0%)	0 (0.0%)	1 (2.9%)
as.factor(respectNW)			*0.043*
Strongly agree	3 (12.0%)	0 (0.0%)	3 (8.6%)
Agree	19 (76.0%)	4 (40.0%)	23 (65.7%)
Neutral	2 (8.0%)	4 (40.0%)	6 (17.1%)
Disagree	1 (4.0%)	1 (10.0%)	2 (5.7%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(respectCW)			*0.483*
Strongly agree	3 (12.0%)	2 (20.0%)	5 (14.3%)
Agree	17 (68.0%)	6 (60.0%)	23 (65.7%)
Neutral	4 (16.0%)	1 (10.0%)	5 (14.3%)
Disagree	1 (4.0%)	0 (0.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(respectPW)			*0.083*
Strongly agree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Agree	17 (68.0%)	4 (40.0%)	21 (60.0%)
Neutral	4 (16.0%)	5 (50.0%)	9 (25.7%)
Disagree	3 (12.0%)	0 (0.0%)	3 (8.6%)

Strongly disagree	1 (4.0%)	0 (0.0%)	1 (2.9%)
as.factor(balancePW)			*0.068*
Strongly agree	3 (12.0%)	0 (0.0%)	3 (8.6%)
Agree	9 (36.0%)	3 (30.0%)	12 (34.3%)
Neutral	10 (40.0%)	3 (30.0%)	13 (37.1%)
Disagree	2 (8.0%)	0 (0.0%)	2 (5.7%)
Strongly disagree	1 (4.0%)	4 (40.0%)	5 (14.3%)
as.factor(nurseR)			*0.678*
Strongly agree	1 (4.0%)	1 (10.0%)	2 (5.7%)
Agree	7 (28.0%)	4 (40.0%)	11 (31.4%)
Neutral	9 (36.0%)	3 (30.0%)	12 (34.3%)
Disagree	7 (28.0%)	1 (10.0%)	8 (22.9%)
Strongly disagree	1 (4.0%)	1 (10.0%)	2 (5.7%)
as.factor(MovingSN)			*0.333*
Strongly agree	4 (16.0%)	2 (20.0%)	6 (17.1%)
Agree	9 (36.0%)	1 (10.0%)	10 (28.6%)
Neutral	5 (20.0%)	2 (20.0%)	7 (20.0%)
Disagree	7 (28.0%)	4 (40.0%)	11 (31.4%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Not applicable	0 (0.0%)	1 (10.0%)	1 (2.9%)

Relationship

Relationship	11 months (n=25)	12 months (n=10)	Total (n=35)
as.factor(seenLW)			*0.314*
Strongly agree	1 (4.0%)	0 (0.0%)	1 (2.9%)
Agree	5 (20.0%)	0 (0.0%)	5 (14.3%)
Neutral	10 (40.0%)	4 (40.0%)	14 (40.0%)

Disagree	8 (32.0%)	5 (50.0%)	13 (37.1%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(acceptNW)			*0.056*
Strongly agree	4 (16.0%)	3 (30.0%)	7 (20.0%)
Agree	17 (68.0%)	3 (30.0%)	20 (57.1%)
Neutral	4 (16.0%)	2 (20.0%)	6 (17.1%)
Disagree	0 (0.0%)	2 (20.0%)	2 (5.7%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(acceptHA)			*0.646*
Strongly agree	4 (16.0%)	3 (30.0%)	7 (20.0%)
Agree	18 (72.0%)	6 (60.0%)	24 (68.6%)
Neutral	3 (12.0%)	1 (10.0%)	4 (11.4%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(acceptPW)			*0.013*
Strongly agree	0 (0.0%)	3 (30.0%)	3 (8.6%)
Agree	17 (68.0%)	3 (30.0%)	20 (57.1%)
Neutral	6 (24.0%)	4 (40.0%)	10 (28.6%)
Disagree	2 (8.0%)	0 (0.0%)	2 (5.7%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(reportPC)			*0.457*
Strongly agree	4 (16.0%)	2 (20.0%)	6 (17.1%)
Agree	16 (64.0%)	4 (40.0%)	20 (57.1%)
Neutral	3 (12.0%)	2 (20.0%)	5 (14.3%)
Disagree	2 (8.0%)	1 (10.0%)	3 (8.6%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(safeRP)			*0.352*

Strongly agree	2 (8.0%)	2 (20.0%)	4 (11.4%)
Agree	13 (52.0%)	4 (40.0%)	17 (48.6%)
Neutral	8 (32.0%)	3 (30.0%)	11 (31.4%)
Disagree	2 (8.0%)	0 (0.0%)	2 (5.7%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(bullyingWP)			*0.595*
Strongly agree	2 (8.0%)	1 (10.0%)	3 (8.6%)
Agree	6 (24.0%)	3 (30.0%)	9 (25.7%)
Neutral	7 (28.0%)	1 (10.0%)	8 (22.9%)
Disagree	8 (32.0%)	3 (30.0%)	11 (31.4%)
Strongly disagree	2 (8.0%)	1 (10.0%)	3 (8.6%)
Not applicable	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(bullyingNM)			*0.646*
Strongly agree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Agree	1 (4.0%)	0 (0.0%)	1 (2.9%)
Neutral	0 (0.0%)	0 (0.0%)	0 (0.0%)
Disagree	15 (60.0%)	5 (50.0%)	20 (57.1%)
Strongly disagree	9 (36.0%)	5 (50.0%)	14 (40.0%)
as.factor(bullyingCN)			*0.061*
Strongly agree	0 (0.0%)	2 (20.0%)	2 (5.7%)
Agree	2 (8.0%)	1 (10.0%)	3 (8.6%)
Neutral	0 (0.0%)	1 (10.0%)	1 (2.9%)
Disagree	15 (60.0%)	5 (50.0%)	20 (57.1%)
Strongly disagree	8 (32.0%)	1 (10.0%)	9 (25.7%)
as.factor(bullyingP)			*0.850*
Strongly agree	1 (10.0%)	2 (8.0%)	3 (8.6%)
Agree	3 (12.0%)	1 (10.0%)	4 (11.4%)

Neutral	4 (16.0%)	3 (30.0%)	7 (20.0%)
Disagree	12 (48.0%)	3 (30.0%)	15 (42.9%)
Strongly disagree	4 (16.0%)	2 (20.0%)	6 (17.1%)
as.factor(bullyingCA)			*0.125*
Strongly agree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Agree	1 (4.0%)	2 (22.2%)	3 (8.8%)
Neutral	3 (12.0%)	3 (33.3%)	6 (17.6%)
Disagree	13 (52.0%)	2 (22.2%)	15 (44.1%)
Strongly disagree	8 (32.0%)	2 (22.2%)	10 (29.4%)
No answer	0	1	1
as.factor(approachNM)			*0.184*
Strongly agree	7 (28.0%)	4 (40.0%)	11 (31.4%)
Agree	13 (52.0%)	5 (50.0%)	18 (51.4%)
Neutral	5 (20.0%)	0 (0.0%)	5 (14.3%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(approachCN)			*0.191*
Strongly agree	10 (41.7%)	4 (40.0%)	14 (41.2%)
Agree	11 (45.8%)	4 (40.0%)	15 (44.1%)
Neutral	3 (12.5%)	0 (0.0%)	3 (8.8%)
Disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Not answered	1	0	1
as.factor(approachNE)			*0.368*
Strongly agree	12 (48.0%)	3 (30.0%)	15 (42.9%)
Agree	8 (32.0%)	4 (40.0%)	12 (34.3%)
Neutral	3 (12.0%)	2 (20.0%)	5 (14.3%)

Disagree	2 (8.0%)	0 (0.0%)	2 (5.7%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(approachM)			*0.377*
Strongly agree	11 (44.0%)	3 (30.0%)	14 (40.0%)
Agree	6 (24.0%)	4 (40.0%)	10 (28.6%)
Neutral	2 (8.0%)	1 (10.0%)	3 (8.6%)
Disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(approachSN)			*0.230*
Strongly agree	9 (36.0%)	2 (20.0%)	11 (31.4%)
Agree	11 (44.0%)	4 (40.0%)	15 (42.9%)
Neutral	5 (20.0%)	2 (20.0%)	7 (20.0%)
Disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(nursePS)			*0.319*
Strongly agree	1 (4.0%)	1 (10.0%)	2 (5.7%)
Agree	9 (36.0%)	4 (40.0%)	13 (37.1%)
Neutral	12 (48.0%)	2 (20.0%)	14 (40.0%)
Disagree	3 (12.0%)	2 (20.0%)	5 (14.3%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(welcomeWP)			*0.019*
Strongly agree	5 (20.0%)	1 (10.0%)	6 (17.1%)
Agree	18 (72.0%)	3 (30.0%)	21 (60.0%)
Neutral	2 (8.0%)	4 (40.0%)	6 (17.1%)
Disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
as.factor(nurse)			*0.283*

Strongly agree	2 (8.0%)	1 (10.0%)	3 (8.6%)
Agree	1 (4.0%)	3 (30.0%)	4 (11.4%)
Neutral	7 (28.0%)	2 (20.0%)	9 (25.7%)
Disagree	10 (40.0%)	3 (30.0%)	13 (37.1%)
Strongly disagree	5 (20.0%)	1 (10.0%)	6 (17.1%)
as.factor(workplaceRS)			*0.214*
Strongly agree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Agree	9 (36.0%)	2 (20.0%)	11 (31.4%)
Neutral	11 (44.0%)	2 (20.0%)	13 (37.1%)
Disagree	1 (4.0%)	2 (20.0%)	3 (8.6%)
Strongly disagree	1 (4.0%)	1 (10.0%)	2 (5.7%)
Not applicable	3 (12.0%)	2 (20.0%)	5 (14.3%)

Knowledge

Knowledge	11 months (n=25)	12 months (n=10)	Total (n=35)
as.factor(educatPP)			*0.641*
Strongly agree	1 (4.0%)	1 (10.0%)	2 (5.7%)
Agree	14 (56.0%)	6 (60.0%)	20 (57.1%)
Neutral	5 (20.0%)	2 (20.0%)	7 (20.0%)
Disagree	4 (16.0%)	0 (0.0%)	4 (11.4%)
Strongly disagree	1 (4.0%)	1 (10.0%)	2 (5.7%)
as.factor(confidentPS)			*0.432*
Strongly agree	3 (12.0%)	0 (0.0%)	3 (8.6%)
Agree	18 (72.0%)	9 (90.0%)	27 (77.1%)
Neutral	4 (16.0%)	1 (10.0%)	5 (14.3%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)

as.factor(confidentCC)			*0.437*
Strongly agree	5 (20.0%)	2 (20.0%)	7 (20.0%)
Agree	13 (52.0%)	4 (40.0%)	17 (48.6%)
Neutral	7 (28.0%)	3 (30.0%)	10 (28.6%)
Disagree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(confidentRC)			*0.243*
Strongly agree	3 (12.0%)	1 (10.0%)	4 (11.4%)
Agree	20 (80.0%)	6 (60.0%)	26 (74.3%)
Neutral	2 (8.0%)	3 (30.0%)	5 (14.3%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(confidentTC)			*0.882*
Strongly agree	4 (16.0%)	2 (20.0%)	6 (17.1%)
Agree	17 (68.0%)	7 (70.0%)	24 (68.6%)
Neutral	4 (16.0%)	1 (10.0%)	5 (14.3%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(perceptNP)			*0.396*
Strongly agree	0 (0.0%)	1 (10.0%)	1 (2.9%)
Agree	9 (36.0%)	5 (50.0%)	14 (40.0%)
Neutral	7 (28.0%)	2 (20.0%)	9 (25.7%)
Disagree	7 (28.0%)	1 (10.0%)	8 (22.9%)
Strongly disagree	2 (8.0%)	1 (10.0%)	3 (8.6%)
as.factor(knowPN)			*0.475*
Strongly agree	3 (12.5%)	0 (0.0%)	3 (8.8%)
Agree	18 (75.0%)	9 (90.0%)	27 (79.4%)

Neutral	3 (12.5%)	1 (10.0%)	4 (11.8%)
Disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
No response	1	0	1
as.factor(workplaceIL)			*0.514*
Strongly agree	3 (12.5%)	0 (0.0%)	3 (8.8%)
Agree	13 (54.2%)	5 (50.0%)	18 (52.9%)
Neutral	5 (20.8%)	4 (40.0%)	9 (26.5%)
Disagree	3 (12.5%)	1 (10.0%)	4 (11.8%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
No response	1	0	1
as.factor(nursesRE)			*0.455*
Strongly agree	4 (16.0%)	1 (10.0%)	5 (14.3%)
Agree	16 (64.0%)	5 (50.0%)	21 (60.0%)
Neutral	4 (16.0%)	4 (40.0%)	8 (22.9%)
Disagree	1 (4.0%)	0 (0.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(managerRE)			*0.643*
Strongly agree	5 (20.0%)	1 (11.1%)	6 (17.6%)
Agree	13 (52.0%)	4 (44.4%)	17 (50.0%)
Neutral	6 (24.0%)	4 (44.4%)	10 (29.4%)
Disagree	1 (4.0%)	0 (0.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
No response	0	1	1
as.factor(chargeNRE)			*0.211*
Strongly agree	4 (16.0%)	1 (10.0%)	5 (14.3%)
Agree	16 (64.0%)	4 (40.0%)	20 (57.1%)

Neutral	4 (16.0%)	5 (50.0%)	9 (25.7%)
Disagree	1 (4.0%)	0 (0.0%)	1 (2.9%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
as.factor(realEM)			*0.489*
Strongly agree	2 (8.0%)	2 (22.2%)	4 (11.8%)
Agree	14 (56.0%)	3 (33.3%)	17 (50.0%)
Neutral	5 (20.0%)	3 (33.3%)	8 (23.5%)
Disagree	4 (16.0%)	1 (11.1%)	5 (14.7%)
Strongly disagree	0 (0.0%)	0 (0.0%)	0 (0.0%)
No response	0	1	1
as.factor(stagesPRT)			*0.370*
Strongly agree	2 (8.3%)	2 (20.0%)	4 (11.8%)
Agree	12 (50.0%)	7 (70.0%)	19 (55.9%)
Neutral	6 (25.0%)	0 (0.0%)	6 (17.6%)
Disagree	3 (12.5%)	1 (10.0%)	4 (11.8%)
Strongly disagree	1 (4.2%)	0 (0.0%)	1 (2.9%)
Not response	1	0	1
as.factor(transitionS)			*0.428*
Strongly agree	3 (12.0%)	4 (40.0%)	7 (20.0%)
Agree	10 (40.0%)	2 (20.0%)	12 (34.3%)
Neutral	5 (20.0%)	2 (20.0%)	7 (20.0%)
Disagree	4 (16.0%)	1 (10.0%)	5 (14.3%)
Strongly disagree	3 (12.0%)	1 (10.0%)	4 (11.4%)

Appendix G

Cycle one-coded phrases and their frequencies

Past Clinical and Educational Knowledge and/or Experience (n=134)	**Clinical Complexity** (n=64)	**Clinical Reasoning and Decision-making** (n= 99)	**Level of Knowledge & Maturity in the Professional Role** (n=60)	**Knowledge of Contextual and Institutional Procedures** (n=25)
Potential and associated risk *(n=41)*	Uncertainty *(n=28)*	Isolate outstanding event/problem *(n=44)*	Sentimentality and emotional support *(n=13)*	Knowledge of contextual practices as facilitator *(n=11)*
			Relationships *(n=3)*	
Familiarity *(n=43)*	Interprofessional Involvement *(n=26)*	Determine clinical relevance *(n=34)*	Knowledge of medical management *(n=29)*	Knowledge of contextual practices as Hindrances *(n=14)*
Association *(n=15)*	Clinical complexity and multiplicity *(n=10)*	Patient acuity *(n=21)*	An underdeveloped professional knowledge *(n=15)*	
Anticipate *(n=27)*				
Past clinical/educational knowledge *(n=3)*				

(n=represents the frequency of coded statement used by participants or code count)

Appendix H

Cycle two- coded phrases and their frequencies.

RQ1: **Level of knowledge and Maturity in the professional role**	RQ2: **Prior exposure and practice experience**	RQ3: **Clinical reasoning and decision-making**	RQ4a: **Increased clinical practice knowledge and exposure**	RQ4b: C**linical complexity**
Transition/reality shock *(n=2)* Familiarity (knowing what to do) *(n=1)* Patient advocacy (knowing who to involve) *(n=10)* Workplace burn-out *(n=2)*	Recognition of relevant clinical information/presenting or potential clinical risk *(n=24)* ● Prior clinical exposure ● Increased knowledge of relevant clinical information and clinical processes	Systematic sequence approach of exclusive, focused reasoning by elimination *(n=21)* ● Recognition/noticing *(n=24)* ● Validation/confirmation *(n=7)* ● Interdisciplinary involvement *(n=23)* Information-seeking from patients, senior-nurse colleagues "novice-nurse way" *(n=2)*	Interdisciplinary involvement *(n=10)* ● Pt. advocacy (knowing who to involve) Increase practice knowledge and experience *(n=25)*	Patient complexity/knowledge overload *(n=10)* Uncertainty *(n=5)* ● Lack confidence. ● With knowing what to do Workplace/unit policies and processes *(n=2)*

(n=represents the frequency of coded statement used by participants or code count)