A QUALITATIVE STUDY OF FORMATIVE ASSESSMENT PRACTICES IN AN
INTERNAL MEDICINE CLERKSHIP COURSE

by

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Abstract

Accrediting bodies for medical schools require that medical students be provided with formative assessment in all clerkship courses. The literature describes many strategies for formative assessment in clerkship settings, but qualitative studies of clerk and supervisor experiences with formative assessment are lacking. In this thesis, I describe a study that explores clerk and supervisor experiences with formative assessment in one internal medicine clerkship course.

First, the literature was reviewed to determine current conceptions of formative assessment and learning in medical education. Then, novice and experienced clerks were recruited to participate. Prior to starting their Core Internal Medicine course, each clerk participated in an interview to understand his or her concepts of learning and assessment. During the six-week course, they replied to an electronic weekly questionnaire to describe and reflect on learning experiences. Finally, they participated in a focus group at the end of the course, to explore their experiences with formative assessment. Supervisors, (residents and attending physicians), who supervised clerks were recruited to participate in one interview to explore their approach to supervision and assessment of clerks, and to understand factors that influenced their ability to do this. All relevant artifacts (forms, policies, procedures) were collected for subsequent analyses.

Four experienced clerks and eleven novice clerks participated, along with eight attending physicians and five residents. Participants identified four key themes as playing a significant role in assessment and learning: (a) the developing role of doctor, (b) the role of the team, (c) working and learning environments, and (d) educational strategies. Data analysis revealed the participants had unclear formal concepts of formative assessment, even though they could all describe the key concepts about how assessment affects learning, and were quite clear about what factors supported learning, and which ones were barriers to learning.

The study contributes to our understanding of clerks’ and supervisors’ experiences with assessment and learning in a workplace-based learning setting. Finally, the study led to recommendations about how to better support formative assessment in the Core Internal Medicine course, and for further research.
Acknowledgements

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*Feedback and its relationship to formative assessment*

*Relationship between feedback, formative and summative assessment in medical education*

Current formative assessment practices in clerkship

*Quizzes*

*Faculty reviewing case presentations*

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Chapter 1: Introduction

In 2007, Queen’s University School of Medicine underwent its scheduled accreditation by the Liaison Committee on Medical Education (LCME). The school was found to be non-compliant with a number of standards. Of particular interest to me as a clinician educator and former clerkship supervisor was standard ED-31. Worded only slightly differently in 2007, this standard currently requires the following:

Each medical student in a medical education program should be assessed and provided with formal feedback early enough during each required course or clerkship (or, in Canada, clerkship rotation) to allow sufficient time for remediation. Although a course or clerkship/clerkship rotation that is short in duration (e.g., less than four weeks) may not have sufficient time to provide a structured formative assessment, it should provide alternate means (e.g., self-testing, teacher consultation) that will allow medical students to measure their progress in learning. (Liaison Committee on Medical Education, 2012, p. 12)

The LCME also requires that “the directors of all courses and clerkships (or, in Canada, clerkship rotations) in a medical education program must design and implement a system of fair and timely formative and summative assessment of medical student achievement in each course and clerkship/clerkship rotation” (Liaison Committee on Medical Education, 2012, p. 12). Formative assessment is not defined in the document, despite requiring that those “directly responsible for the assessment of medical student performance should understand the uses and limitations of various test formats, the purposes and benefits of criterion-referenced vs. norm-referenced grading, reliability and validity issues, formative vs. summative assessment” (Liaison Committee on Medical Education, 2012, p.12).

The results of the accreditation process prompted a complete curricular overhaul between 2009 and 2010. The new undergraduate medical curriculum was launched in September 2010 for the class of 2014. These students started clerkship in September of their third year, four months earlier than previous students.

The new clerkship curriculum still requires clerks to complete eight core courses lasting five to six weeks each. Structurally, each course is considered to be an independent course, and the assessment of clerk learning and performance uses only information gathered during one course. Within any one course, a clerk is likely to have both residents (medical school graduates with an educational license, who are training in a specific program) and attending physicians (fully licensed physicians, who have faculty appointments at Queen’s University) as supervisors, all with varying levels of experience and expertise.
Prior to 2012, informal discussions with clinical clerks at Queen’s University indicated that, despite the mandating of formal formative assessment during each course, feedback on learning was considered infrequent and varied in its usefulness (Gibson 2008). This condition is consistent with reports from clerks in other medical schools (Daelmans, Hoogenboom, Donker, Scherpber, Stehouwer, & van der Vleuten, 2004). Given the focus of attention triggered by the accreditation process and the various forms of curricular redesign that have been undertaken in response, the current course director for the Core Internal Medicine Clerkship course, hereinafter referred to by the pseudonym “Dr. Bond”, agreed this was an opportune time to examine the current nature and role of formative assessment in a clerkship course. He consented to this report including explicit references to Queen’s University, and has been apprised of the results of the research throughout by periodic meetings, email contact, and at the Department of Medicine’s Grand Rounds on November 22nd, 2012, where I presented my research.

The remainder of this chapter describes the purpose, rationale and context for my study.

Purpose

This study has three interrelated purposes. The first is to document the current ideas and practices related to formative assessment in clerkship settings. The second is to document ideas and practices related to formative assessment in the Queen’s University Core Internal Medicine Clerkship course. Finally, what is learned in this study will be used to provide recommendations intended to improve the quality and use of formative assessment in the Core Internal Medicine Clerkship course. The study with these recommendations will be made available to individuals with leadership responsibilities in clerkship rotations at Queen’s University, including the Clerkship Director, members of the Student Assessment Committee, and the Associate Dean for Undergraduate Medical Education.

The focus on formative assessment, as opposed to feedback, was chosen to explore a specific concern that arose from the 2007 accreditation visit: the site visit team felt reported that students and faculty in the School of Medicine appeared unclear as to what formative assessment was, and whether it was incorporated into the curriculum.

Research questions.

The primary questions that need to be answered to serve these purposes are:

1. What are current conceptions of formative assessment and learning especially as these are being formulated in medical education?
2. How do clinical supervisors and clerks in the internal medicine clerkship course describe the role of assessment in learning?

3. To what extent is formative assessment integrated into learning in the core internal medicine clerkship course?

4. To what extent do clerks who finish this clerkship course recognize and value current strategies of formative assessment?

Seeking perspectives from clerks and supervisors (residents and attending physicians) will contribute to a better understanding of current practices. Comparing these perspectives and practices to newer understandings of the roles and options for formative assessment will reveal any discrepancies that could be limiting the role of assessment in supporting learning. A subsequent analysis of these discrepancies, taking into account the opportunities and constraints inherent in the current organization of the clerkship, will lead to recommendations on possible ‘next steps’ in improving assessment and learning during the clerkship.

**Rationale**

This study is being carried out primarily to understand current strengths and challenges relating to formative assessment in the Core Internal Medicine clerkship course at Queen’s University, with a view to making recommendations to improve the current assessment system, by analyzing the discrepancies between current practices and our understanding of formative assessment and its role in learning in medical education contexts.

**Context For This Study**

For the first two to two-and-a-half years of medical school, medical students are based primarily in classroom settings learning about medicine. Their patient contact experiences are only carried out in controlled settings in carefully regulated learning experiences. Students become clerks in September of the third year of medical school. It is through clerkship courses that they experience workplace-based learning for the first time and the expectation that they will work as part of a health-care team. The clerkship operates within a rotating schedule. Clerks must complete eight core courses, the order of which varies considerably, as only one eighth of the class can be enrolled in any course at any one time. Clerks may complete their internal medicine clerkship course during any one of eight periods over the course of their last two years of medical school.

Each Queen’s University clerk must complete the five- or six-week core internal medicine clerkship course. At any given time, 12 or 13 clerks are enrolled in this course, all starting and finishing at the same time. Each clerk is
assigned to one of four Clinical Teaching Units (CTUs) at Kingston General Hospital (KGH), so there are three or four clerks on each CTU.

**Structure of clinical teaching units.**

At any given time, each CTU is responsible for the care of approximately 20 to 25 patients, admitted under an attending physician who is licensed to practice internal medicine and who is ultimately responsible for patient care. All attending physicians are also faculty members at Queen’s University. Typical patients are those who require admission to hospital for specific issues or illnesses, such as infections, weakness, confusion, reactions to medications, and many other issues. The average length of stay is 7.6 days, but many are admitted much longer due to the severity of their illnesses (Internal Medicine Program Director, personal communication, September 30, 2011).

Each CTU team has four or five resident physicians. Residents are physicians-in-training who have completed an undergraduate medical degree and have been accepted to a particular post-graduate training program, and granted an educational license by the College of Physicians and Surgeons of Ontario. Senior residents on CTU are usually in their second or third year of three years of training in internal medicine, and are spending eight weeks on a core internal medicine rotation, in accordance with the requirements set out by the Royal College of Physicians and Surgeons. The two or three junior residents on each team are either first year residents in internal medicine, or residents from other programs (e.g., surgery or family medicine) who are required to complete rotations in internal medicine. Junior residents usually spend eight weeks on the team. An attending physician supervises all the residents, as required by the residents’ educational licenses.

Thus, each CTU is usually comprised of one attending physician, two senior residents, two to three junior residents, and three or four clerks, all of whom are providing care to approximately 25 patients admitted to KGH.

It is important to note that the composition of the team changes frequently. Currently, attending physicians usually spend two weeks at a time on a CTU, and then another attending physician takes over the CTU. Senior and junior residents change every four to eight weeks. Clerks, as noted, start a rotation every five to six weeks. This is demonstrated in Figure 1 below from the perspective of a clerk on a CTU, in terms of how often his or her attending physician and residents change during a six-week rotation. Each different colour represents a different individual with whom the clerk will work on their team over the course of their six-week rotation. This is only one example of a schedule, but there are many variations on the theme.
Figure 1. Six-week composition of the clinical teaching unit team from a clerk’s perspective.

Figure 1, in fact, oversimplifies the turnover on the teams, as it does not take into account vacations or other absences. However, it does demonstrate that any one clerk, in a six-week rotation, will work with up to four attending physicians, up to four senior residents, and up to six junior residents.

Clerk Responsibilities on the Clinical Teaching Unit.

Weekday responsibilities.

A typical day for a clerk on CTU would start at 7:45 a.m. with participation at sign-in rounds in a classroom setting. At this time, residents present summaries of interesting patients, and an attending physician leads a discussion about relevant medical issues. Clerks may be called upon to answer questions, appropriate to their level of training. Clerks then see their patients, before meeting with their senior resident with or without their attending physician. As described under the “expectations” section on the course website for clerks:

• You are expected to carry three to five patients. Only under exceptional circumstances should you ever exceed five. If you do, please make [the Course Director] aware.

• See and examine every patient every day.

• Write a detailed note on every patient every day.

• Write all necessary orders (and get them co-signed).

• Complete discharge summaries as appropriate.

• Present your patients on rounds.

• Sign-out your patients at the end of each day.

• Supervision. You are NEVER alone.
  • [Second year resident] and/or [third year resident] available always
Over the course of the morning, clerks will normally see their three to five patients, and often discuss the patient’s issues with a senior resident, who might also see the patient with them. If there are orders to be written pertaining to a patient’s care (e.g., medication changes or investigations), the clerk may write the orders in the patient’s chart, but they must be co-signed by a resident or an attending physician before they can be enacted by nursing or other hospital staff, since clerks do not have a medical license.

The clerks will then participate in clinical rounds with the attending physicians. While on clinical rounds, clerks are responsible for presenting a summary of the patients under their care, and for answering any questions that arise, if possible. The attending physician will often teach while on these rounds based on the issues that arise from all the patients. Any team member might be asked, at any point, to answer questions posed by the attending physician. These rounds may take the form of “paper rounds,” where the team sits and discusses the patients in a team room, or they might be more traditional rounds where the entire team walks around the wards seeing patients. When the teams see patients together, the attending physician will sometimes lead the team in bedside teaching, where they review signs and symptoms of diseases and demonstrate them on a patient, with the patient’s consent.

Most days, there are teaching sessions over lunch for all internal medicine trainees. Afternoons are generally spent completing clinical rounds, following up on issues from the morning, meeting and examining new patients, writing notes and orders on patient charts, and preparing patients for discharge via paperwork and phone calls. Two days a week, there is clerk-specific teaching from 4:00 p.m. to 5:00 p.m. where the course director or delegate leads the clerks in case-based teaching.

**Weeknight and weekend on-call responsibilities.**

If the clerk is on call on a weeknight, (which happens approximately five times in six weeks) he or she will usually be up most of the night assessing patients, and admitting them to the hospital from the emergency department. The next morning, clerks are excused from their duties once they have handed over any outstanding patient issues to another member of their team. If they are on-call on a Saturday, Sunday or holiday, they usually work at the hospital for 24 hours. During this time, they are also expected to care for other patients admitted to their CTU, which would include discussing their cases with residents and attending physicians, writing notes and orders in
their charts, and preparing patients for discharge. When on-call, clerks often work with different residents and attending physicians than those on their team.

Thus, over the course of a six-week rotation, clerks will work with many residents and attending physicians in all these different contexts, although they will spend most of their time with and receive primary supervision from the residents and the attending physicians on their own CTU.

**Course structure.**

In January 2011, Dr. Bond was appointed as the new course director for core internal medicine. As the course director, he is responsible for developing the curriculum and overseeing the experience of clerks during the course. Ultimately, it is his responsibility to ensure that the assessment plan for the course is consistent with the guidelines set out by the School of Medicine, and for determining the pass/fail grade for each clerk. The organization of the course is laid out on the course webpage, housed in a password-protected area of MEdTech, the curricular management system of the School of Medicine (Queen’s University School of Medicine Core Internal Medicine, 2012b). An overview will be provided here.

**Supervisors.**

For the purposes of this research, the term “supervisors” will be used when referring to both attending physicians and residents, as both groups are responsible for supervising clerks in overlapping but different ways. Where appropriate, the terms “attending physicians” and “residents” will be used if issues pertain solely to one of these groups, as opposed to all supervisors in general.

There are approximately 50 attending physicians in the Department of Medicine who take turns being attending physicians for two weeks at a time on the four CTUs, and they are the supervisor on record for the clerks working on CTU at that time. The residents on the CTU also act as supervisors to the clerks, although how much supervision they provide depends on their role. On CTU, senior residents (second or third year internal medicine residents) are expected to provide supervision to clerks, in that clerks are normally required to report to them first, and they are responsible for overseeing the clerks’ provision of care to patients. Junior residents (generally in their first year of residency, from different disciplines) still have some supervisory responsibilities for clerks, even if it is simply to assist in co-signing orders for the clerks’ patients if the senior resident or attending physician is not available.
Attending physicians vary in terms of their CTU involvement. Some attending physicians only spend two weeks in a year providing CTU coverage, while others are scheduled up to 12 times in the year. While all these physicians have faculty appointments at Queen’s University, their role descriptions vary significantly. Some are physicians who have very significant non-clinical roles (e.g., directing research programs, or providing leadership within Queen’s University or for hospitals), and they might spend 60% or more of their time on non-clinical work. Other physicians are required to do more clinical work, often up to 80% or 90% of their time. These physicians have some non-clinical expectations as Queen’s University faculty members, but their main focus is on clinical work. The nature of the clinical work of the attending physicians also varies. While all these attending physicians provide some coverage for inpatients, many of them have frequent outpatient clinics, which might be their main focus of clinical work. Because KGH is a teaching hospital, those who spend more time caring for patients will generally be spending more time working with clerks and residents, in both inpatient and outpatient settings. Overall, as a result of these varying roles of clinical faculty at Queen’s University, there is significant variation in attending physician experience with supervising clerks in a CTU setting.

Assessment.

While the focus of this study is on formative assessment, the goal of making sense of how clerks and their clinical instructors actually conceptualize formative assessment is not possible without fully understanding the assessment context and the frequency and intricacy of assessments clerks experience throughout the clerkship. I will describe the assessment process from the perspective of a clerk in the Core Internal Medicine Course, based on what is outlined on the course page. In order to receive a passing grade in the course, clerks must meet all of the following standards, published on the course website (Queen’s University School of Medicine Core Internal Medicine, 2012b), each of which will be described in detail below:

In order to successfully complete the Core Medicine Course, students must demonstrate:

1. Satisfactory clinical performance as indicated by the Mid-Rotation Evaluation form (submitted at the halfway mark of the rotation)
2. Completion of two Mini-PEX evaluations during your rotation;
3. Satisfactory clinical performance as indicated by the Clinical Performance Evaluation (CPE) form. One CPE will be submitted at the end of the rotation;
4. Satisfactory performance (minimum scaled score of 60) on the National Board of Medical Examiners (NBME) Medicine Shelf exam;

5. Satisfactory completion of the Mandatory Encounters (and tasks) for both core and subspecialty rotations as documented by the required logging tool. The log will be reviewed at week 9 of the combined 2-block period. It must be completed prior to the last Friday of the final core/subspecialty rotation. If a student feels that s/he is unable to complete a particular encounter, s/he must submit notice of this to the Course director. A mutual plan must then be developed to remedy the deficiency.

Assessment forms.

As described above, clerks must have four forms completed (with no major concerns noted) in this rotation: two Mini-PEX forms, one mid-rotation form, and one CPE (Appendices A, B, and C). The processes for these will be described below. The mid-rotation and CPE forms are required forms for all clerkship courses (Queen’s University School of Medicine, 2011b). In addition, however, Dr. Bond introduced a new form, entitled the “Core Medicine Mid-block Assessment Form”, which is included as Appendix D. This form is meant to supplement the mid-rotation form, and its use will be described below.

The Mini-PEX form (Appendix A) is a form that must be filled out by an attending physician after they directly observe a clerk complete a focused physical examination of a patient. A former course director designed the form based on the Mini-CEX (Dr. Previous Course Director, personal communication, 2005), an encounter card described by Kogan and Hauer (2006) and other authors; the main difference is that the focus of the Mini-PEX is exclusively on the physical exam, as opposed to an entire clinical encounter. The clerk approaches any two of their attending physicians to ask them to watch a physical exam and fill out the form. The attending physician is supposed to provide feedback to the clerk about their performance. The form includes tick boxes (“needs improvement” or “satisfactory”) for different domains being assessed (e.g., “humanistic qualities”), and there is a section for comments at the end (Appendix A). These forms are submitted to the course director to review. By using this form, the course is in compliance with the Student Assessment During Clerkship policy, which requires that “assessment of student clinical and communication skills must be based on direct observation” (Queen’s School of Medicine, 2011a, p. 1).
After three weeks of the core internal medicine course, the current attending on the CTU is responsible for providing mid-rotation formative assessment and feedback to the clerks on the team by way of filling out the mid-term assessment form (Appendix B). He or she may or may not seek input from other team members before filling out the form. The Student Assessment During Clerkship policy does not mandate a meeting between the clerk and the attending physician for this mid-rotation assessment, but does note that any “marginal notations will mandate a meeting with the course director of faculty delegate” (Queen’s University School of Medicine, 2011a, p. 1). The mid-rotation form includes prompts for the attending physician to provide feedback, including “The student demonstrates strength in the following area(s)” and “These have been identified as opportunities for improvement” (Appendix B). There is also a prompt for an action plan: “Suggested actions to enhance student learning/performance” (Appendix B). Attending physicians and clerks are required to sign the form. The form is then submitted to the course director for review. The completion of this form meets the requirement for formative feedback provision to clerks in the clerkship course.

In addition to completing the mid-rotation form, Dr. Bond instituted a new practice in 2012 (Dr. Bond, personal communication, August 16 2012), whereby he adopted the RIME framework described by DeWitt, Carline, Paauw, and Pangaro (2008). This was developed as a new “Core Medicine Mid-block Assessment” form (Appendix D). Before filling out this form, he seeks input from all attending physicians and senior residents who have worked with the clerk by the three-week point of the course, asking them to use the RIME framework (which he provides them) to provide an overall impression of the clerk’s performance on the scale of reporter-interpreter-manager-educator. This framework defines different levels of clerk performance, which starts at the reporter level, and, usually, progresses through the other levels. The form is also designed to assist him in providing specific feedback, organized as “continue”, “do more of”, “consider”, and “do less of”. He compiles this feedback, and arranges a face-to-face meeting with each clerk to provide him or her with this feedback (Dr. Bond, personal communication, August 16 2012).

At the end of the rotation, the current attending physician is responsible for completing the clinical performance evaluation (CPE) (Appendix C). Again, he or she may or may not seek feedback from other team members, and he or she may or may not meet directly with the clerk. This form is structured in two parts. The first part is a checklist of assessment items (e.g., foundational knowledge, history taking, management plan), rated as “does not meet expectations”, “inconsistently meets expectations”, and “meets expectations”, except where yes/no
responses are more appropriate, such as “accepts supervision and feedback” (Appendix C). The second part uses “continue”, “start”, “consider”, “stop” boxes as prompts for narrative feedback, with space for other comments (Appendix C). Clerks and supervisors must sign the form, and clerks may add their own comments. There is no requirement for a face-to-face meeting with the attending physician filling out the CPE. Once the attending physician has completed the CPE, it is forwarded to the course director for review. There is one final section for the course director on the CPE to document his review of the clerk’s logging of mandatory tasks and encounters, and for his signature. As per the Student Assessment in Clerkship policy, the course director is required to have an exit interview with all clerks (Queen’s University School of Medicine, 2011a), and he provides them with further feedback at this meeting.

National Board of Medical Examiner’s clinical science: medicine exam.

Clerks must receive a scaled score of 60 or greater on the National Board of Medical Examiners (NBME) Clinical Science: Medicine Exam in order to pass their core internal medicine course. This is an American standardized exam designed for clinical clerks and Queen’s University clerks write the exam at the end of their second internal medicine block. According to the NBME website: “NBME subject examinations are achievement tests in a broad sense, requiring medical students to solve scientific and clinical problems” (National Medical Board of Medical Examiners, 2012, para. 1). However, only at the end of 10 to 12 weeks of internal medicine (or two courses) are clerks able to write the NBME exam. Since clerks have to complete both the course in core internal medicine and a course in subspecialty medicine before taking this examination, only 50% of clerks will actually write this exam at the end of their core internal medicine course. (Note: the subspecialty medicine course is the sister course to core internal medicine, always taking place immediately before or after core internal medicine. It is also a five- to six-week course.)

Mandatory tasks and encounters.

During each clerkship course, including core internal medicine, clerks must log that they have had exposure to course-specific clinical presentations (such as chest pain or shortness of breath) and to specific tasks (such as dictating a consultation letter). In Core Internal Medicine, there are 22 specified distinct clinical presentations, and three mandatory tasks (Appendix E). Clerks complete their logs electronically and results are forwarded to the course director. If a clerk feels that he or she has been unable to get exposure to a particular encounter or task, he or she is to speak to the course director, whose responsibility it is to arrange for an appropriate experience to address the deficiency. Understanding of the assigned presentations is generally assessed on the NBME examination. Again,
clerks might not log all their presentation at the end of their first internal medicine course, but they are expected to have logged all of them by the end of their two internal medicine courses.

**Final summative assessment.**

It is Dr. Bond’s responsibility, as the course director, to review all of the assessment criteria for each clerk and to make a recommendation as to whether they pass or fail the course. His recommendation is first brought to the Clerkship Examiners meeting, and then brought to the Progress and Promotions (P & P) Committee for Undergraduate Medicine whose mandate is to determine whether medical students have passed their required courses, and ultimately to determine who will graduate with a medical degree. Because Core Internal Medicine is a required course, clerks cannot graduate from medical school without having passed the course. The Student Evaluation, Progress, and Promotion Policies (Queen’s University School of Medicine, 2011b) dictate this process.

If a clerk fails any clerkship course, most of the time he or she would be offered the opportunity by the P & P Committee for remediation, often by repeating the course, generally with increased supports or supervision, which would include regular formative assessments and feedback. The ultimate decision about remediation, and what is required there, or other options (such as repeating all of clerkship) lies with the P & P Committee, who have access to the clerks’ assessments dating back to the beginning of medical school. The committee will usually receive recommendation from the Clerkship Committee about a remediation plan, and will often agree and require the clerk to participate in the remediation as proposed. However, the P & P committee has the mandate to look at the complete assessment picture of the clerk before making their recommendations, and thus, if they have information about the clerk’s performance issues prior to starting clerkship, they might not accept the proposed plan of remediation. Instead, the P & P committee might require different types of remediation for different clerks, depending on the clerk’s past performance and the nature of the clerk’s deficiencies. For example, if a clerk had no previous performance issues, and was found to have deficits in clinical reasoning that pertained particularly to core internal medicine, he or she would likely be required simply to undertake the remediation plan proposed by the Clerkship Committee, due to this being an isolated issue. A typical remediation plan would involve the clerk undertaking extra clinical duties with an experienced supervisor, with clear requirements for regular formative feedback and direct observation, until he or she demonstrated they could meet the objectives for clinical reasoning. By contrast, if a clerk had a pattern of concerning performance in communication skills or professional behavior dating back to the pre-clerkship years, despite previous remediation plans, he or she might be required by P & P to undergo more intensive
remediation, and then re-start clerkship. Each decision is taken individually, according to the Student Evaluation, Progress, and Promotion Policies (Queen’s University School of Medicine, 2011b).

From a clerk’s perspective, failing core internal medicine would at best require they undertake some form of remediation, possibly with a delay in graduation, or at worst, (if part of a pattern of performance that did not appear to be amenable to remediation), failing could result in them not graduating, and thus not being able to pursue a residency position, and ultimately, they would be unable to practice medicine.

**Summary of the course structure**

In summary, clerks spend five or six weeks assigned to one CTU for the duration of their core internal medicine course. During this time, they care for patients under the supervision of residents and attending physicians. Simultaneously, they are learning about common internal medicine presentations through their patient care experiences, discussions with their supervisors, attending mandatory teaching sessions, observing other team members (including their peers) and their own independent studies. Multiple supervisors assess their knowledge and performance based on clerkship-wide objectives. Their knowledge is further assessed on a standardized examination.

**Thesis Overview**

This thesis is organized into six chapters. In this chapter, I outlined the background for the study, the purpose and research questions and provided a detailed description of the complex context for the education of clerks. In Chapter 2, I will review the literature as a way to address the first research question: “what are current conceptions of formative assessment especially as these are being formulated in medical education?” I will focus on the definitions and purposes of formative assessment, analyze current literature on the use of formative assessment in clerkship settings, and connect these uses to the theories of learning that might be informing the clerkship. Chapter 3 will describe the methods used for the study, including the rationale for the qualitative methods chosen, the process of participant selection, and an outline of the data collection and analysis techniques. Chapter 4 provides a description of the participants and the conditions that likely influenced their responses to my questions. Chapter 5 describes my findings beginning with the themes and a preliminary analysis of what these themes might represent. My analysis of results will continue in Chapter 6 with specific answers to research questions 2, 3 and 4. In Chapter 7, I will discuss the implications of my findings for the Core Internal Medicine Clerkship course at Queen’s University, and consider the transferability of my findings to other clerkship rotations.
Chapter 2: Literature Review

Theoretical Frameworks

In this section, I will answer the first research question; namely, what are current conceptions of formative assessment especially as these are being formulated in medical education? First, I will discuss pertinent definitions and determine appropriate definitions for the purposes of this study. Then, I will review the current literature on formative assessment in clerkship settings. Finally, I will discuss theories that appear to underlie formative assessment practices in clerkship settings.

Definitions.

Formative Assessment.

Multiple definitions exist for formative assessment. McMillan (2007) defines formative assessment as “assessment that occurs during instruction to provide feedback to teachers and students” (p. 432). With respect to classroom settings, he states “formative assessment is what teachers do when they obtain information about student understanding during instruction and provide feedback that includes correctives to help students learn” (p. 17), and thus focuses on the teacher. However, in a chapter entitled “Formative Assessment: Assessing and Promoting Student Progress during [italics added] Instruction” he notes, “the goal of formative assessment is the improvement of student motivation and learning,” thus implying a potential student role in formative assessment. Subsequently, he states “assessment without the use of instructional changes is not formative”, again, focusing mainly on the teacher (p. 118). This definition is basic, and focuses primarily on the teacher’s use of formative assessment.

Black and Wiliam (1998) proposed a more inclusive definition, describing formative assessment as “encompassing all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged” (pp. 7-8). This definition is quite broad, as it applies to both students and teachers, and to teaching and learning. It is too broad for an operational definition for this study, but it does expand the definition to include the student’s learning activities.

Sadler (1989) stated that formative assessment “is concerned with how judgments about the quality of student responses can be used to shape and improve the student’s competence by short-circuiting the randomness and inefficiency of trial-and-error learning” (p. 120). Sadler also notes “the primary distinction between formative and summative assessment relates to purpose and effect, not to timing” (p. 120). Thus, Sadler focuses the discussion a bit more on “improv(ing) the student’s competence”, and brings in the notion that how the assessment is used is more
important than the timing of the assessment (p. 120). This focus on the use of the assessment as opposed to the timing of the assessment is an important distinction from the definitions described earlier.

Taras (2005) argued, “All assessment begins with summative assessment (which is a judgment and that formative assessment is in fact summative assessment plus feedback which is used by the learner” (p. 466). To understand her argument, it helps to review her definition of assessment: “I take ‘assessment’ to refer to a judgment which can be justified according to specific weighted set goals, yielding either comparative or numerical ratings” (p. 467). Summative assessment, she proposes, is “judgment which encapsulates all the evidence up to a given point. This point is seen as a finality at the point of the judgment” (p. 468). Then, she defines formative assessment:

Since the process of assessment is a single process, i.e., making a judgment according to standards, goals and criteria, formative assessment is the same process [italics added] as summative assessment. In addition, for an assessment to be formative, it requires feedback which indicates the existence of a ‘gap’ between the actual level of the work being assessed and the required standard. It also requires an indication of how the work can be improved to reach the required standard.

Therefore, both summative assessment and formative assessment are processes. It is possible for assessment to be uniquely summative where the assessment stops at the judgment. However, it is not possible for assessment to be uniquely formative without the summative judgment having preceded it. (p. 468)

Ultimately, Taras (2005) argues that summative assessment must come first (before formative assessment) because “it is necessary to assess the quality of the work before the feedback can be given for the learner to use” (p. 472). This statement does not define what the assessment of the quality of work is anchored to, whether it how the student should be performing at the end of a course, or compared to peers, or other standards. However, Taras is arguing that there is inherently a judgment against some standard that must be made in order for the assessor to provide feedback to the student about their performance, and how to improve.

Taras’ 2005 definitions build on Sadler’s argument that the use of the assessment is what is most important, but she has a strong position that all assessment must have a summative component (defined as a judgment against a standard, essentially), and that formative assessment depends on these judgments, in order for the assessor to provide meaningful feedback.
In workplace-based learning settings, including the clerkship, summative and formative assessment often overlap significantly. For example, direct observation of a clerk’s performance by a supervisor is used in certain rotations at Queen’s University to provide formative feedback to the clerk part way through the rotation. This same supervisor might be responsible for the final assessment of the clerk’s overall performance during the entire rotation. The formative assessment exercise may influence the summative assessment by the supervisor of the clerk, if, for example, he or she reflects back on his or her direct observation of the clerk’s performance during the “formative” direct observation. Thus, during the formative assessment process, there is a judgment of the clerks’ skills, and this judgment might influence the final grade, positively or negatively.

Thus, although some authors describe formative assessment as being independent of summative assessment, in a workplace-based learning setting, the two are often linked or have overlap. The relationship between formative and summative assessment may well be complex in the clerkship setting, as well. Regardless, it is important to review concepts of feedback in the context of formative assessment, in order to further understand the relationships between formative assessment, summative assessment, and feedback.

At Queen’s University School of Medicine, our accepted definition of formative assessment is actually one of formative feedback proposed by Shute in 2008, which is “information communicated to the learner that is intended to modify his or her thinking or behavior for the purpose of improving learning” (p. 154). As a school, we have adopted a policy that formative assessment strategies may count towards a final mark, provided that the weighting of the assessment is not too high (Queen’s University School of Medicine, 2011b). This is most applicable in the courses that proceed clerkship. For example, midterm examinations (which contribute to the final mark) are counted as examples of formative assessment, in that the school mandates that students have the opportunity to review their midterms so that they can determine where they had difficulties, and that course directors or delegates review the midterm with the class as a whole, thus providing the feedback to the class. This is consistent with what Taras has proposed: “formative assessment is in fact summative assessment plus feedback which is used by the learner” (2005, p. 466). In clerkship settings, the delineation between formative and summative assessment maybe further blurred, as forms and specific tasks that are supposed to be formative in nature are often required to be completed “successfully” (which can include some summative judgment) in order to pass a course. (The Mini-PEX would be a good example of this.)
The School of Medicine’s definition of formative assessment is most consistent with what Sadler and Taras describe, as opposed to MacMillan’s classroom-based definition, and is more precise that Black and Wiliam’s definition. For the purposes of this study, I will adopt my own definition, informed by the literature, and consistent with the accreditation standard as set out by the Liaison Committee on Medical Education (2012): Formative assessment is any assessment practice where clerks receive feedback on their performance, which will enable them to measure their progress in learning and to remediate any areas of concern. This definition focuses the results of the assessment on its intended use: primarily to help to the clerk to improve their performance, although it may well provide useful information to the assessor and the school as well.

Feedback and its relationship to formative assessment.

While there is consensus that feedback is an essential component of formative assessment, definitions of feedback vary. Black and Wiliam (1998) define feedback “in its least restrictive sense” as “any information that is provided to the performer of any action about that performance” (p. 53). Cantillon and Sargeant (2008) summarize many definitions as: “feedback is about providing information to students with the intention of narrowing the gap between actual and desired performance” (p. 1292). Sadler (1989) draws a distinction between “self-monitoring”, where “the learner generates the relevant information”, and feedback, where “the source of information is external to the learner” (p. 122). He specifies that “formative assessment includes both feedback and self-monitoring,” and “the goal of many instructional systems is to facilitate the transition from feedback to self-monitoring” (p. 122). This distinction between feedback and self-monitoring will be used for the purposes of this paper.

Sadler (1998) also raises the “question of standards” in the discussion of formative assessment (p. 83). He notes “effort must be put into creating learning environments where teachers’ judgments are minimally contaminated by the performance of other (that is, current) students” (p.83). This is consistent with a criterion-referenced model where teachers should be assessing each clerk according to an accepted standard, as opposed to how they compare to their peers in a norm-referenced model. However, Sadler (1998) acknowledges that “it is impossible to make judgments about the quality of something purely ‘it its own terms’, that is, in the complete absence of any reference points or framework at all” (p. 83). Sadler suggests developing standards, and “to make consistent judgments against those standards” (p. 83). His argument for standards relates to the negative consequences of negative feedback, which he attributes to “inadequately specified standards” (p.83), resulting in students being compared to their cohort, and thus interpreting comments as “personal criticism” (p.84). He proposes that a different approach could be
derived from the literature where one would “dissociate ego-involving and task-involving feedback, that is, to push towards measuring true accomplishment” (p.84). Sadler feels that a requirement for this to work however is “a system of assessment in which absolute improvement, when it is made, is clearly recognized” (p.84). Thus, feedback (or self-monitoring) would serve to recognize growth, more so than identifying where the student rates versus established criteria. In the School of Medicine’s Queen’s Undergraduate Medical Education Competency Framework, the “core competencies” are defined as what the “competent medical graduate” will be able to do at the completion of their degree (2011, p.3). Specifically, this is a curricular model that adopts a criterion-referenced approach (defining the standards for graduates as opposed to a norm-referenced approach (ranking graduates), and is conducive to the approach to feedback described by Sadler.

In 2008, van de Ridder, Stokking, McGaghie, and ten Cate undertook a literature search about “definitions of feedback”, in order to provide “an operational definition” of feedback in clinical education (p. 189). Based on their review, they proposed this definition: “Specific information about the comparison between a trainee’s observed performance and a standard, given with the intent to improve the trainee’s performance” (p. 193). They then dissect their definition into 10 key elements, and they elaborate on each of these: clinical education, performance and task, trainee, feedback provider, comparison between performance and standard, observation, standards of comparison, specific information, intention, improvement (pp. 193-194). This definition and its elaboration comprises elements of the other definitions reviewed thus far, and relates back to the definitions of formative and summative assessment. It is clear that feedback is not self-monitoring, in that there is an identified individual responsible for providing the feedback. The “comparison to standard” (p. 194) element relates back to concepts by Taras (2005) and Sadler (1998) of the need for a standard to which the clerk’s performance is compared and that the intent of the assessment (to help the clerk improve) is important. It is a very useful operational definition for medical education, and is very applicable in a clerkship setting. As a result, it will be used as the appropriate definition of feedback for the purposes of this study.

**Relationship between feedback, formative and summative assessment in medical education.**

Several themes emerge from the literature. First, formative assessment requires, not surprisingly, assessment of a clerk’s performance against predetermined criteria. The intended use of the assessment is what will make it formative. The information obtained from formative assessment is used to provide feedback to the student about their performance, ideally to be used by the student to improve their performance. This does not necessarily
preclude also using this same assessment for summative purposes, as described previously with respect to the use of midterm examinations in the pre-clerkship terms. However, without the opportunity for feedback (by reviewing the exam and having access to resources to assist with remediating the deficiencies), the midterm does not meet the definition of formative assessment.

In clinical workplace-based learning settings in medical education, assessment increasingly focuses on performance. In this setting, the distinction between formative and summative assessment can be particularly blurred. As described previously, if a supervisor assesses a clerk’s performance as part of a mid-rotation assessment process, he or she is conducting an assessment (summative, according to Taras, 2005), that might well influence the final assessment for that clerkship course. By contrast, if a course director provides feedback to a clerk at the end of a clerkship course that the clerk can then use in a subsequent rotation, what was initially a summative assessment might now meet the definition of a formative assessment.

In medicine, as in other professions, any assessment system (including its formative components) will need to attend to a desire for clerks to demonstrate progress and growth as they move through their training and the clear mandate to ensure that they will ultimately meet the standards of the profession. Clerks require formative assessment with appropriate feedback in order to make changes so that they will eventually meet professional standards. Supervisors must be able to provide this feedback, and may need to adapt clerks’ experiences in order to facilitate appropriate growth.

Current formative assessment practices in clerkship.

The literature in clerkship settings offers many examples of formative assessment practices. This section will review this literature around these practices and include a critique of representative studies.

Quizzes.

Quizzes are not currently included at Queen’s University in the clerkship setting, but they are prominent in the pre-clerkship curriculum, and are highly rated by students in course evaluations as useful forms of formative assessment. Brar, Laube, and Bett (2007) at the University of Buffalo describe introducing quizzes to improve clerk performance on standardized exams. They introduced “quantitative feedback” in the form of quizzes administered every two weeks in a six-week obstetrics rotation, self-marked by clerks after the answers were discussed in a small group setting with a faculty member (p. 530.e2). The authors compared the performance on the NBME clerkship obstetrics and gynecology subject test of the intervention group with that of a control group who had very similar
rotations, without the quizzes. The intervention group scored “significantly higher than students who completed the clerkship without feedback,” including higher scores overall, and fewer failures. There was no impact on how many students achieved honours. This study highlights that simple feedback measures may have a significant impact on clerk achievement on standardized examinations, especially for weaker clerks, even in a shorter rotation. What is not clear from this study is whether the same effect would be achieved without the faculty feedback; this represents a relevant point for discussion.

Alexander, Bloom, Falchuk, and Parker (2006) reported on a novel use of quizzes in an internal medicine clerkship course at Harvard. On a weekly basis for their 12 weeks of internal medicine, clerks received five multiple-choice questions to answer via a web-based platform, and they received instant notification of correct answers. Each question was one of a “question-pair”, which were “designed to assess a single core knowledge objective” (p. 926). Before being included in the study, the questions were subject to further analysis, looking at “congruency in subject matter, structure, and level of difficulty” (p. 926). Once the weekly results were tabulated, one specific “knowledge deficiency” was identified for that cohort of 14 to 16 clerks. Half of the clerks then received a 15-minute didactic session to address the deficit, whereas a control group did not receive the intervention. In the subsequent week, the paired question was administered as part of the weekly quiz, in order to assess performance after the intervention.

Overall, clerks provided very positive feedback on the weekly quizzes, regardless of whether they received the intervention teaching session. Comments included “I enjoyed this teaching model because it helped me identify clerkship objectives that I needed to focus on” (Alexander, Bloom, Falchuk, & Parker, 2006, p. 928). Different knowledge deficits were identified over the course of the academic year, where 34 of 48 database topics were identified as a deficiency at least once, and no trend was detected. Clerks in the intervention group consistently had higher scores on their posttest questions than the control group (79% correct vs. 61% correct, p<0.1).

The approach to using quizzes in this study addresses a number of common challenges in clerkship settings. First, it provides timely feedback (or at least an opportunity to self-monitor) to clerks. Secondly, it allows faculty to tailor their teaching to specific learning needs within a specific cohort, which is an on-going challenge in a longitudinal clerkship model. Other than the initial up-front development of a question database, there would be very little additional faculty time required to implement the model, particularly in the current model in core internal medicine, where twice weekly teaching sessions are already provided.
Faculty reviewing case presentations.

Mkony, Mbembati, Hamudu, and Pallangyo (2007) described an initiative where selected faculty members were paid an honorarium to review clerk case presentations at a university in Tanzania. In this intervention, clerks “receive(d) immediate, constructive suggestions from faculty members. Teachers adopted positive attitudes towards clerks and used positive language during the clinical case presentation and discussion” (p. 4). The authors report on the improvement in the learning climate (based on survey and focus group data), where previously some teachers were described as “harsh and unduly critical during clinical case presentations” (p.14). The description of methodology is quite limited, however, in terms of the implementation and the evaluation. No information was provided regarding faculty development. This study appears to be a preliminary attempt to introduce formative assessment in a clerkship setting. Of note, the time protected for clerks and faculty during clinical rotations for formative assessment was substantial, at 90 minutes per day, five days a week and participating faculty received an honorarium to “teach outside their usual teaching commitment” (p. 7). However, as it is a task that clerks are carrying out on a daily basis, it highlights a possible opportunity for formative assessment. It is encouraging that an intervention can improve a learning climate, although it is unclear if the role of significant dedicated time and resources for formative assessment was crucial to this outcome.

On-line and printed modules.

On-line modules are used frequently in the pre-clerkship curriculum at Queen’s University, and they are used in certain clerkship courses. Palmer and Devitt (2008) at the University of Adelaide described the use of on-line case-based modules and printed case material to provide formative feedback to clerks in a surgery clerkship rotation. It was recommended that clerks in the intervention groups work through the on-line and printed modules that provided “instant and detailed feedback on their decisions, as well as feedback on the decisions an experienced practitioner might have made” (p. 9). There was infrequent use of the modules, as tracked electronically, (30% in one group was the highest rate of access), and there was no difference in final examination performance compared to a control group. Palmer and Devitt comment that “any advice and help (the students) were offered with regard to self-directed study and formative assessment did not appear to produce any variation in their improvement in cognitive skills or change in study habits”, despite what they describe as “clear guidance at the beginning of the course” (p. 22). Although the authors state that feedback was provided to the clerks via the on-line modules, according to Sadler (1989), the clerks were provided more with an opportunity for self-monitoring. It is not clear from the article how the
modules relate to the final summative assessment, and as the authors note “students are capable of manipulating their study time to focus on examinations at the expense of understanding subject matter” (p. 26), which raises questions about alignment of assessment with course objectives.

This study highlights the necessity of providing appropriately structured formative assessment in order to benefit student learning. It will be important to learn the extent to which clerks did or did not use the modules and how they perceived it affected their learning. Further study of how on-line modules are used in assessment would be helpful. Is their role primarily in the self-monitoring realm, or can they provide meaningful feedback about how clerks might improve their performance? The modules used in Adelaide provided standardized feedback to clerks based on their answers, but did not allow for dialogue. Modules could also incorporate on-line discussion boards, or individualized feedback to clerks by faculty, which could potentially add another dimension to on-line formative feedback.

*Feedback on clinical notes.*

As described previously, required tasks for clerks in the clerkship include the requirement to dictate and write notes on their patients. At present, these are not assessed in any formal or systematic way, other than the requirement for clerks to log that they have created certain medical documents (e.g., a discharge summary). Other medical schools have used clinical notes, however, as opportunities to provide feedback to clerks.

Spikard, Gigante, Stein, and Denny (2008) described a novel use of the electronic medical record and on-line resources at the Vanderbilt School of Medicine in the United States to provide feedback to clerks. Clerks’ case write-ups from the electronic medical record were automatically captured in the Clinical Learning Portfolio (CLP) System. This program allowed supervisors to provide electronic feedback to clerks. Faculty reported they were “more satisfied with the feedback (they) provide(d)”, and 75% of clerks reported they agreed or strongly agreed that it was “a valuable teaching tool” (p. 981). Initial analysis of the quality of the clerk write-ups did not detect a significant difference between those using the CLP and those who were not, but sub-analysis of the assessment and plan portions of the reports did suggest higher quality reports in the intervention group. This initiative represents formative assessment based on actual clerk performance, and provides personalized, relevant feedback to clerks about their workplace-based clinical work. Clerks could implement changes in a timely manner and then receive further feedback; this feedback cycle can be challenging to achieve in short rotations. This study highlights the potential role of technology in reducing barriers to formative assessment.
Direct observation.

In 2011, the Student Assessment Committee at the Queen’s University School of Medicine recently raised concerns at the Curriculum Committee that, in the clerkship, “students are not observed often enough to ensure performance expectations are met” (Queen’s University School of Medicine Student Assessment Committee). As noted in Chapter 1, two episodes of direct observation are required in the Core Internal Medicine clerkship course, and are documented on the Mini-PEX (mini-physical exam) forms. The clerk is supposed to receive feedback on their performance of the physical exam. Currently, clerks will often choose the patient they wish to examine, and the portion of the physical exam they wish to have observed. While this may be very helpful to many clerks, the Student Assessment Committee has raised concerns about the possibility for Mini-PEX assessments to be somewhat arbitrary. The concern is that clerks might only ask to be assessed on portions of the physical in which they feel most comfortable in order to perform well on the assessment, rather than to seek feedback on a skill they feel requires attention. This relates to the tension between formative and summative assessment in a workplace-based setting. The Liaison Committee on Medical Education’s accreditation standards requires direct observation of clerks, although it is not specified that it must be used in a formative fashion (Liaison Committee on Medical Education, 2012). Two different models for direct observation in clerkship settings are reviewed below. The first is direct observation by multiple faculty in a standardized setting, and the second uses video and standardized patients.

McKinley, Fraser, van der Vleuten, and Hastings (2000) reported on a very formal formative assessment structure for senior medical students (equivalent to clerks) in the United Kingdom, which involved two faculty observing six patient interactions per student in a clinic setting, followed by probing post-encounter questions, resulting in detailed oral and written feedback. Faculty members completed a three-day workshop on “teaching and assessment in the consultation” (p. 575). One half-day was required for each student to consult on six patients. The authors report good reliability (0.94) for pass/fail judgments for two assessors observing six consultations per student (p. 576). They also provide a thorough discussion of the features related to validity, reliability, feasibility, and “educational impact and acceptability” (p. 579). In the student feedback, “99% believed they had been given specific advice on how to improve and 98% believed that the feedback they had been given would help them to improve their consultation performance throughout their undergraduate years” (p. 576). This study demonstrates that students experienced useful formative assessment through direct observation in a standardized, resource intensive, setting.
In California, Srinivasan, Hauer, Der-Martirosian, Wilkes, and Gesundheit (2007) instituted a standardized-patient practice-based “clinical performance examination” (p. 857) at the midpoint of clerkship at three different medical schools. Clerks participated in eight stations, and self-rated their performance after each station. The standardized patients (SP) rated clerk performance using a tool with good reliability (Cronbach’s $\alpha$ ranged between 0.77 and 0.91). One to two months later, clerks reviewed video of three of the stations. Depending on their randomization, they self-rated either before or after receiving their SP score and written comments, and performance benchmarks for their class including “the class mean, standard deviations, z-scores for each skill and a visual representation of their relative rank with boxplots of class data” (p. 859). All clerks received this information after their self-reassessment. Analysis of the clerks’ initial self-assessments revealed weak correlation with SP ratings except for doctor-patient communication (p. 861). Clerks generally downgraded their self-assessment after video review, regardless of whether they had access to SP scores and comments and benchmark data. This was most prominent in clerks in the lowest quartile, with little change in the highest quartile. Clerks who received benchmark data prior to their self-reassessment achieved improved correlation with SP data, whereas video review without benchmark data did not improve correlation. This study has some interesting implications. Although not explicitly described as formative assessment by the authors, clearly clerks are receiving feedback about their performance without any direct faculty involvement. The authors have also explicitly examined clerk self-assessment skills, and have described a strategy that appears to improve the accuracy of self-assessment. An SP-driven assessment system exists in the first year of the medical curriculum at Queen’s University, but it has never been used in a clerkship setting. The study raises interesting possibilities about delivering formative assessment without faculty involvement, in specific settings.

**Clinical encounter cards.**

The Mini-PEX is a locally developed form of a clinical encounter card, (Dr. Previous Course Director, personal communication, 2005), based on the Mini-CEX, which will be described shortly (Kogan & Hauer, 2006; Holmboe, Yepes, Williams, & Huot, 2004). Many different cards and systems for use are described in the literature, and representative studies that address their potential for formative assessment are reviewed below.

Ozuah, Reznik, and Greenberg (2007) used clinical encounter cards where faculty members in a pediatric clerkship rotation were asked to provide written and oral feedback to clerks after routine clinical encounters. The authors report “significant improvement of the perception of feedback received by clerks” (p. 451).
Goldenhar, and Stanford, (2006) describe a very similar intervention in a psychiatry clerkship that resulted in more mid-rotation feedback, and clerks were more likely to request feedback. Card systems appear to encourage the quantity of feedback in different clinical settings but the quality of the feedback is unknown.

To attempt to address concerns about the quality of feedback, Bandiera and Lendrum (2008) designed daily encounter cards (DECs) based on the roles from the CanMEDS competency framework (Frank, 2005) to facilitate the provision of formative feedback about specific competencies to first-year residents in their emergency medicine rotations. These roles include medical expert, communicator, collaborator, scholar, advocate, manager, and professional, and there are detailed descriptions of all these competencies (Frank, 2005). At the completion of each shift, one supervisor rated each learner on two or three of the seven roles based on their observations as “needs attention”, or “area of strength” (p. 46). Over the course of a four or eight week rotation, each resident worked with multiple supervisors, similar to what is encountered in many clerkship rotations. The authors report that “learners get ongoing targeted feedback” as a result of the DECs (p. 49), based on the result that each learner had received feedback on six of the seven roles over the course of their rotation. Despite their desire to encourage formative feedback, they noted a significant leniency bias, with only 1.3% of the ratings indicating that the role “need(ed) attention” (p. 47). In the setting of multiple supervisors, many of whom might only work with the learner once, it might be challenging to identify areas for improvement. Although the design of the DEC appeared to encourage feedback, the authors did not analyze the narrative comments, and the quality of the feedback is unknown, and they acknowledge this in their discussion.

In Melbourne Australia, DeWitt, Carline, Paauw, and Pangaro (2008) also attempted to “improve students’ and preceptors’ experiences with feedback” by developing a feedback tool based on RIME, a “descriptive evaluation framework” which stands for “Reporter-Interpreter-Manager-Educator” and represents a description of “minimal expectations for learners as they progress in their training” (p. 1205). This rubric has anchors of “needs improvement”, “competent”, and “strength”, with narrative descriptions of clerks in each category (p. 1208). A column is included for “next steps” for each of the RIME domains (p. 1208). Fourteen preceptors and eight clerks in a longitudinal integrated clerkship (where clerks are not on a rotating schedule) attended a one-hour workshop about RIME, and then used it monthly during a five-month period. In the pilot, the authors surveyed the preceptors and the clerks about the tool. Preceptors were positive about the tool after the workshop, with 85% believing “the tool would make giving feedback easier and improve their ability to give feedback” (p. 1207). Clerks rated the RIME-based
feedback more highly than “usual feedback”, and reported it “help(ed) them understand specifically what was needed to improve their performance” (p. 1207). Of note, all preceptors used the RIME tool although it was not the official evaluation form. Although this was a small pilot, this study provides encouraging results about the RIME tool in encouraging feedback that is perceived by clerks and faculty to be useful. Although not highlighted by the authors as being significant, the joint workshop may have played a role in the acceptance of the tool by clerks. As noted in Chapter 1, Dr. Bond has adopted this framework in his recently introduced Core Medicine Mid-block Assessment Form (Appendix D).

Sokol-Hessner, Shea, and Kogan (2010) reported on their qualitative analysis of the action plan section of an astonishing 5356 encounter cards used in multiple clerkship courses at the University of Pennsylvania. They found that 78% of the cards had at least one intelligible comment, and most of these (85%) had an action plan. However, only 54% of the action plans were “specific”, as determined by their coding approach. For example, “Prepare every interaction” was coded as a general action plan, whereas “Please try to read the subject about surgical cases a day prior to surgery” was coded as a specific action plan (p. S112). The authors acknowledge that verbal feedback may have included more action plans, and that “limited space available (on the form) may affected action plan presence and specificity” (p. S114). They plan to use their data in future faculty and resident development.

These studies suggest that encounter cards can increase the frequency of feedback being provided to clerks, but that the quality of the feedback appears to be variable. The role of faculty development, and the potential role for joint clerk/faculty workshops on feedback are worth highlighting. It is not clear if clerks have clear concepts of formative assessment and feedback, and the same could be said for faculty, and this will be a focus of this study.

Direct observation and encounter cards.

As with the Mini-PEX, direct observation is often documented by use of encounter cards. The Mini Clinical Examination (Mini-CEX) is a well-studied assessment tool in clinical rotations where supervisors directly observe clerks interacting with actual patients, and then they grade the learners on the card and provide feedback. It has been studied in clerkship and residency settings (Kogan & Hauer, 2006). Holmboe, Yepes, Williams, and Huot (2004) specifically studied the feedback portion of the Mini-CEX with interns in the first year of training after clerkship. In an outpatient internal medicine setting, the discussion of the Mini-CEX was audiotaped, transcribed and analyzed. The authors reported that 80% of sessions were found to include one or more recommendations for improvement, but only 10% had an action plan to help learners improve (p. 559). Learner self-assessment was documented in 34% of
sessions, and “faculty-enabled learner reaction” was noted in 61% (p. 559). The authors suggested modification of the Mini-CEX form to include an action plan, as “the lack of action plans is particularly unfortunate because it suggests that faculty may not be ‘closing the loop’ to ensure that deficiencies noted were addressed by the intern” (p. 560). Although it is possible that more feedback was provided than usual due to the presence of the audio taping (i.e., an intervention effect might have been present), this study lends further support to previous studies that suggest that the frequency of feedback was improved with the use of the Mini-CEX, and there is some preliminary evidence that the quality of the feedback was reasonable.

This study highlights one particular element of the definition of feedback provided by van de Ritter, Stokking, McGaghie, and ten Cate (2008), namely the “specific information” (p. 194) which requires that “feedback must contain a minimum amount of specification to serve its purpose” (p. 194). The authors elaborate: “Utterances that cannot be understood by the feedback recipient in behavioural terms should not be called feedback” (p. 194). This is a key point when trying to understand how clerks experience formative assessment and feedback in a clerkship setting. One study in a residency setting by Sender-Liberman, Liverman, Steinert, McLeod, and Meterissian (2005) found that although 90% of faculty surgeons reported they were providing feedback to their trainees, only 17% of residents agreed with the assertion. In this study, it will be important to explore how both clerks and supervisors experience formative assessment and feedback. For the purposes of this study, these studies again argue for the need to explore clerks’ understanding of formative assessment and feedback, in order to understand their experiences with formative assessment in a clerkship setting.

**Multi-course feedback and 360° assessment.**

One of the challenges at Queen’s University is to ensure that all the competencies described in the Queen’s Undergraduate Medical Education Competency Framework (2011) are assessed appropriately. The collaborator and communicator competencies could be assessed, for example, in part by members of the health care team who are not the immediate supervisor of the clerk. Hesketh et al. (2005) describe a detailed 360° assessment system for trainees in the United Kingdom who are in the first year of residency training (known as Preregistration House Officers or PRO’s). The Preregistration House Officer Appraisal and Assessment SysTem (PHAST) is a comprehensive longitudinal system which aims to “give meaningful feedback to every trainee” (p. 220), in addition to identifying learners at risk early in their training and to providing documentation that is used to influence licensing decisions. Four raters in different positions (supervisor, senior resident, and nurse, for example) completed a 42-item
questionnaire twice during the PRO year. The authors demonstrate that the PHAST “gives valuable formative feedback to all trainees as well as trainers and can be successfully implemented in a busy hospital environment,” (p. 230). This strategy collects assessment information that is used summatively while providing formative feedback to the learners. This relates to the interrelated nature of formative and summative assessment, as described previously, and highlights again how the use of the assessment is what is crucial.

**Blinded patient encounters with faculty feedback.**

Queen’s University does not currently use blinded patient encounters in the clerkship as an assessment practice at present. Burch, Seggie, and Gary (2006) of South Africa introduced the Bedside Formative Assessment (BFA) where clerks completed “blinded” patient encounters (where they did not have access to previous documentation regarding the patient) while on teaching rounds, and then received feedback (p.430). Most clerks reported that the BFA process “improved their clinical reasoning skills (88.2%)” and 70% “acknowledged the informative, advisory and motivational role of feedback” (p. 431). In terms of learning behaviour, 71.9% of clerks reported an “increase in preparatory reading” (p. 431) where they felt they read more background material than they would have before the intervention. There was no association between the BFA and performance on the composite summative assessment that consisted of “four observed real patient encounters, a written examination, and a structured portfolio interview” (p. 430). However, the authors note the study was not intended to detect this, and the composite summative assessment tended to focus more on knowledge-based objectives versus objectives that might reflect what was assessed during the BFA, such as clinical reasoning skills. Although some blinded bedside assessments might occur in teaching rounds during Core Internal Medicine, this is not systematized at present. The BFA intervention is encouraging in its impact on clerk learning behaviour. In this proposed study, it will be important to explore how any formative assessment practices impact on learning behaviour, and the reasons for this according to clerks.

**Themes from the literature on formative assessment practices.**

The literature describes that formative assessment is being used in many different fashions in different clerkships internationally. Analyzing them through the framework of current concepts of formative assessment and feedback leads to some themes that are worth exploring in the proposed study. First, authors have differing concepts of formative assessment and feedback, and it may be that this influences the success of their interventions. This is evident in the study by Brar, Laube, and Brett (2007) using quizzes, where they are reporting on supposedly
quantitative feedback (which could technically be more consistent with self-monitoring), when in fact the review
with a faculty member (which could be feedback consistent with more broad definitions) could well be contributing
to the increased test scores. The negative aspect of this lack of clarity of definition could be the cause of the poor
uptake of the modules as studied by Palmer and Devitt (2008), where it was not clear that the modules could provide
feedback per se, but more opportunities for self-monitoring, which, according to Sadler, might not be effective for

Building on this, a second theme that emerged was the need for education regarding formative assessment
and feedback, likely for clerks and for supervisors, which is not surprising given the lack of clarity regarding
definitions. Although not situated within the clerkship setting, a study by Boehler et al. (2006) examined how
pre-clerkship medical students reacted to feedback after being taught how to tie surgical knots in a randomized controlled
trial. One group of students received “specific, constructive feedback” while the other group received “general
compliments” (p. 746). The students who received constructive feedback were significantly less satisfied than those
who received compliments, despite showing an improvement in their technique, whereas the students who were
complimented showed no improvement in technique. This study highlighted the need to educate students about the
role of feedback in their learning.

Only DeWitt, Carline, Paauw, and Pangaro (2008) explicitly described involving clerks in education about
feedback tools in their RIME study. No studies focused on faculty development related to providing feedback,
although many interventions did incorporate some faculty education (e.g., McKinley, Fraser, van der Vleuten, &
Hastings, 2000; Mkony, Mbembati, Hamudu, & Pallangyo, 2007), although the details are often unclear.

Given the questions about how clerks and faculty understand formative assessment and feedback, it is not
surprising that those studies that focused on clerk or faculty perception of the assessment process had variable
results. Most studies were not able to evaluate the quality of the feedback provided or how clerks used feedback,
which might also contribute to low satisfaction ratings.

In general, the studies were not designed to detect a change in learning outcomes, although some authors
did detect a change in student behaviour (Burch, Seggie, & Gary, 2006). In the medical education context, where
most supervisors do not have formal education backgrounds, some faculty might question the role of formative
assessment and feedback, especially if they perceive that it requires extra time or resources, if some of the questions
regarding learning outcomes are not addressed. Palmer and Devitt (2008) note: “If academic staff are going to
prepare formative learning material for students, there must be some indication that the effort would be worthwhile” (para. 29). Probing to understand clerk and faculty concepts of formative assessment, and exploration of how clerks experience formative assessment in clerkship settings might contribute to addressing some of these common concerns. Although the LCME is clear on the need for formative assessment, better understanding of formative assessment in general by faculty and clerks could support the implementation of a successful formative assessment strategy. Evidence that formative assessment strategies enhance learning would be powerful in this context.

This study will explore how clerks and supervisors in the Core Internal Medicine clerkship experience formative assessment, and how formal (as described in the literature) and informal assessment practices contribute to learning. Perceptions of barriers will be explored as well, to determine if the issues raised in many studies are of concern at Queen’s University.

**Theories of learning in clerkship settings.**

In this section, theories that might apply to learning in clerkship settings are reviewed, to highlight the role of formative assessment in this setting. Due to the complexity of medical education, and the “black box” nature of clerkship (van der Vleuten et al., 2000, p. 594), a number of theories might be relevant in formative assessment in clerkship. The following will be discussed: communities of practice, zone of proximal development, novice to expert, self-regulated learning, and reflective practice.

**Communities of practice.**

The theory of communities of practice has relevance in many workplace-based learning settings, including the clerkship. In 1991, Lave and Wenger “(drew) attention to the point that learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community” (p. 29). They describe a process of starting at “legitimate peripheral participation” (p. 29) where initially “people have to join communities and learn at the periphery” where “the tasks they do may be less key to the community than others” (Smith, 2009, Legitimate peripheral participation and situated learning section, p. 2). As their competence develops, they move into “full participation” (Lave & Wenger, p. 37). With respect to situated learning, they note it is “more encompassing in intent that conventional notions of ‘learning in situ’ or ‘learning by doing’. (L)earning is an integral and inseparable aspect of social practice” (p. 31).
In medicine, the process of moving from legitimate peripheral participation to full participation begins primarily in the clerkship (although some preliminary works takes place in the pre-clerkship curriculum), and progresses throughout residency and ultimately into the early years of practice. Initially, at the beginning of clerkship, clerks have limited roles within the medical team. Their roles develop as they move through a course, working with physicians, practicing new skills, but also gaining new understanding of what it is to be a clerk, working in a health care team with other health professionals. As Lave and Wenger (1991) note: “the purpose is not to learn from talk as a substitute for legitimate peripheral participation; it is to learn to talk as a key to legitimate peripheral participation” (p.109). Clerks are learning to become doctors while they are learning clinical material and skills.

Although Lave and Wenger (1991) do not address formative assessment per se in their discussion of communities of practice, they provide examples in their analyses of what might be the use of assessment for learning. For example, in describing the training of quartermasters, they note that novices’ activities are “closely monitored by the more experienced watch stander who is always on hand and can help out” (p. 74). This is a model used throughout clerkship.

**The zone of proximal development.**

Vygotsky’s theories share some concepts about how learning occurs with the theory of communities of practice. Shepardson (1999) notes that, according to Vygotsky, “teaching and learning rest in socially created settings” (p. 622) which could be analogous to Lave and Wenger’s (1991) communities. Rushton (2005) links Vygotsky to formative assessment, noting “the process involves the teacher and student collaborating to enable the best performance by the student” (p. 511). Both Shepardson and Rushton refer to Vygotsky’s “zone of proximal development,” described as “the distance between the actual development determined through problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). Although the definition refers to school-aged children, it applies to more general principles of formative assessment, especially where the guidance is provided in the form of feedback to help improve a learner’s performance. As well, it could apply to the process of learners moving from the periphery into the various communities described by Lave and Wenger.

The notions of communities of practice and zone of proximal development both share the assumption that the development of expertise occurs best when the learner has formal access to one or more individuals who can be
trusted to support and adequately critique emerging understandings and skills. My research examines the extent to which physicians and clerks describe the learning process in these terms and whether or not formative assessment activities contribute to any such interactions.

**Novice to expert.**

Novice to expert theory has relevance in the clerkship setting. In 1984, Benner applied Dreyfus’ Model of Skill Acquisition (Dreyfus, 1972) to nursing based on interviews with nurses at various stages of their careers. She described nursing practice at the novice, advanced beginner, competent, proficient, and expert stages. For example, novices “must use … context-free rules to guide their task performance”, since they have an “inability to use discretionary judgment” whereas advanced beginners “(have) coped with enough real situations to note the recurrent meaningful situational components” (Benner, p. 403). The subsequent stages are competent, where nurses are “characterized by a feeling of mastery and the ability to cope with and manage many contingencies of nursing”; proficient, where “the proficient performer perceives the situation as a whole, rather than in terms of aspects, and performance is guided by maxims”; and finally expert, where the expert nurse “has an intuitive grasp of the situation and zeroes in on the accurate region of the problem without wasteful consideration of a large range of unfruitful possible problem situations” (Benner, p. 405). Benner does not attempt to describe how nurses move from novice to expert stages, but notes “experience is not the mere passage of time or longevity; it is the refinement of preconceived notions and theory by encountering many actual practice situation that add nuances or shades of differences to theory,” (p. 407), acknowledging that time spent in clinical practice alone does not necessarily lead to expert status.

Daley (1999) interviewed novice and expert nurses to understand how their learning changes. Nurses were classified as novices or experts based on a qualitative analysis of clinical narratives provided by study participants. In her analysis, Daley notes that in general, “novice nurses tend to learn through more formal mechanisms. While novices appeared to learn though a process of concept formation, experts seemed to use more informal mechanisms, such as consulting with peers and other health care professionals” (p. 136). It was also noted that “novices did not seem to have an understanding of their own learning processes” (p. 144), compared to experts, and Daley comments that this is “contradictory to the literature in adult education on learning from experience” (p. 144). This is quite relevant in how novice learners in professional fields use feedback, especially if they lack understanding of how they are learning, particularly in a new, non-classroom-based context. It is for this reason that this study will seek to
understand how clerks understand the role of formative assessment and feedback in their learning in clinical situations.

In critiquing Benner’s work, Field (2004) notes that to “acquire the levels of nursing practice learning” the nursing student “requires an adequate practice placement, and stimulating dialogue with an excellent mentor” (p. 561). Field reviews the role of the practice educator, a nurse with an academic role, who “has the potential to provide learning opportunities for the kind of application, analysis and synthesis of information which gives students an understanding of what nursing is about” and is supposed to support the mentor, a practicing nurse, who might have “clinical expertise” beyond that of the practice educator (p. 563). She concludes by noting that a “study of the literature related to situated learning and legitimate peripheral participation demonstrated the key positions of mentors” and “the opportunities available to them to coach students from novice to expert performances” (p. 565), thus highlighting the critical role of feedback in the development of nursing practice.

Although formative assessment is not explicitly described in the novice to expert literature, its role in helping students move from novice to expert performance is implied. As Benner (1984) highlighted, time alone does not enable the development of expertise, but rather there is a process of “refinement of preconceived notions” (p. 407), which could be facilitated by appropriate formative assessment and feedback by more expert teachers. Field (2004) refers to coaching as a role for mentors, which could include a role for feedback.

At the beginning of clerkship, clerks are clearly rank novices, with little work-place based experience, and are often trying to apply the “context-free rules” (Benner, 1984, p. 403) they learned in the pre-clerkship curriculum. By the end of the clerkship, they might be “competent” as clerks (p. 405), but they are not ready for independent practice, appropriately, as they still have a residency program to complete. Formative assessment strategies could help clerks move along the novice to expert continuum, although they may not move beyond “advanced beginner” with respect to their performance as physicians (p. 405). Understanding novice to expert theory could help to inform the development of a formative assessment system in the clerkship. My research examines the extent to which clerks, including novice and experienced clerks, describe their use of formative assessment in learning.

Self-regulated learning.

In 2008, Zimmerman described self-regulated learning (SRL) as:

the self-directed processes and self-beliefs that enable learners to transform their mental abilities into an academic performance skill. SRL is viewed as proactive processes that students use to acquire academic
skill. These processes include setting goals, selecting and deploying strategies, and self-monitoring one’s effectiveness, rather than as a reactive event that happens to students due to impersonal forces. Although SRL was initially viewed as especially important during personally directed forms of learning, it was also deemed important in social forms of learning, such as seeking help from peers, parents and teachers. The core issue is whether a learner displays personal initiative, perseverance, and adaptive skill. (p. 167)

The profession of medicine has explicitly adopted the principles of self-regulated learning, especially as it applies to continuing professional development for practicing physicians as mandated by governing bodies (College of Family Physicians of Canada, 2012; The Royal College of Physicians and Surgeons of Canada, 2012). It is desirable for training programs to identify and nurture self-regulated learning skills.

Formative assessment systems should embed principles of self-regulated learning, by allowing the self-regulated learner to ask for and receive appropriate feedback to meet their own goals. Nicol and Macfarlane-Dick (2006) note, “in higher education, formative assessment and feedback should be used to empower students as self-regulated learners” (p. 199). They describe seven principles of good feedback practice in the context of self-regulated learning:

• helps clarify what good performance is (goals, criteria, expected standards);
• facilitates the development of self-assessment (reflection) in learning;
• delivers high quality information to students about their learning;
• encourages teacher and peer dialogue around learning;
• encourages positive motivational beliefs and self-esteem;
• provides opportunities to close the gap between current and desired performance;
• provides information to teachers that can be used to help shape teaching. (p. 205)

These seven principles have obvious ties to the 10 elements of the definition of feedback by van de Ridder, Stokking, McGaghie, and ten Cate (2008), specifically those of feedback provider, comparison between performance and standard, standards of comparison, intention, and improvement (pp. 193-194).

In 2011, Sandars and Cleary published a guide on behalf of the Association for Medical Education in Europe on self-regulation theory and its applications in medical education. They argue that a:

comprehensive theoretical model of self-regulation has the potential to further inform the practice of medical education if specific attention is paid to implementing key self-regulation processes in teaching and
learning, such as encouraging and facilitating student goal-directed behavior, use of specific strategies to attain goals, and the adaptation and modification of strategies when goals are not met. (p. 878)

In the guide, the Sandars and Cleary (2011) review applications of SRL theory in classroom settings and in learning technical skills. In a section entitled “Feedback focused on self-regulation processes” (p. 883), they discuss internal feedback that occurs through self-monitoring, and external feedback, given by others. Although they do not explicitly discuss self-regulation theory in clerkship, the principles they outline would apply particularly well in a workplace-based learning setting such as the clerkship. My research explores how clerks perceive that they seek and use formative assessment and feedback they receive in a clerkship setting, which is a key component of self-regulated learning.

**Reflective practice.**

Schön’s theory of reflective practice relates to the education of professionals. In his book, *Educating the Reflective Practitioner* (1987), Schön notes “professional artistry is understood in terms of reflection-in-action, and it plays a central role in the description of professional competence” (p. 35). He describes situations encountered by professionals where known rules don’t apply, leading professionals to “rethink (their) knowing-in-action in ways that go beyond available rules, facts, theories and operations. (They) respond to the unexpected or anomalous by restructuring some of (their) strategies of action, theories of phenomena, or ways of framing the problem” (p. 35).

With respect to how professionals learn and teach in practicum settings, Schön noted in a presentation to the American Educational Research Association in April 1987:

[They] learn by doing with others in the virtual world of the practicum in interaction with someone who is in the role of coach, more like a coach than like a teacher, because that coach is trying to help them do something. [They participate] in a kind of dialogue where the dialogue consists not only in words but in doing. The student’s performance tell[s] the coach, “This is what I make of what you have said. This thing that I’m doing now is what I make of what you have said.” And the coach [is] observing and seeing the difficulties that the student has. At its best this dialogue between coach and student becomes a dialogue of reciprocal reflection-in-action where each of them is reflecting on, and responding to, the message received from the other. (para. 20)

This description of a learning interaction could apply to the clerkship, which is essentially a prolonged practicum, and highlights the role of feedback provided by the coach in the student’s performance. It would not be
reasonable to expect “professional artistry” by the end of the clerkship, but there is still a role for this type of reflective practice, in helping students to move along the novice to expert continuum. Maudsley and Strivens (2000) try to place Schön in context for undergraduate medical education. They draw a parallel between professional artistry to the expert phase as described by Benner (1984), and ask: “Surely initial professional education is intended, however, to produce the competent rather than the expert practitioner?” (p. 58). The dialogue as described by Schön would help students to understand how an expert would approach a problem, and the teacher might “model the ‘expert’ process” yet “it still appears to be founded on a greater library of experiences that then newly qualified professional can be expected to have” (Maudsley & Strivens, 2000, p. 58). However, this type of dialogue in the clerkship, especially in the context of formative assessment, might be more to achieve the following goal for future physicians “they need to learn how to learn, and know about knowing” (Maudsley & Strivens, p. 59). This study will explore clerk and faculty experiences of providing feedback in a clerkship setting. In summary, understanding the theories of communities of practice, novice to expert, self-regulated learning, and reflective practice can inform the analysis of formative assessment practices in clerkship.

Chapter Summary

In this chapter, I discussed current concepts of formative assessment and feedback as they pertain to medical education. I analyzed current literature describing formative assessment practices in clerkship settings, and connected these practices to theories of learning that might be informing the clerkship. Although the literature provides us with many different examples of formative assessment initiatives in clerkship, no studies were found that examined clerks’ experiences of formative assessment in clerkship settings, or that explored supervisor experiences with providing formative assessment. This gap provided me with the rationale for a qualitative approach examining formative assessment practices in one particular clerkship rotation, to try to better describe current challenges and opportunities relating to formative assessment. In Chapter 3, I will outline my method for my research.
Chapter 3: Method

One of the three interrelated purposes of this study is to document ideas and practices related to formative assessment in the Queen’s University Core Internal Medicine Clerkship course. For this reason, qualitative research methods were chosen, and will be elaborated upon below. Table 1 provides an overview of the methods used to address each research question. Question 1 (What are current conceptions of formative assessment and learning especially as these are being formulated in medical education?) was answered in Chapter 2. The methods pertaining to Questions 2 through 4 are included below.

Rationale For Qualitative Research Method

Qualitative methods were chosen in order to explore clerk and supervisor experiences with formative assessment in the current internal medicine clerkship course, primarily through the use of journals, interviews, and document analysis. I wish to understand the experiences of clerks and supervisors with assessment and its role in learning, which is best accomplished through qualitative methods. I am studying “behaviour as it occurs naturally” (McMillan & Shumacher, 2010, p. 321), where the “situational context is very important in understanding behaviour” (p. 322). The questions raised are concerned with “understanding the social phenomenon from the participants’ perspective” (p. 12). My goal is to understand clerk and supervisor experiences with formative assessment in the clerkship setting; I seek to “provide ‘rich’ descriptions that cannot be achieved by reducing pages of narration to numbers” (p. 322). Thus, qualitative methods were used throughout this study.

Setting

The Core Internal Medicine course, as described in the context section in Chapter 1, was the focus of my study for several reasons. First, its challenges are quite typical of many clerkship rotations where clerks work with multiple attending physicians and residents, many of whom might contribute to the assessment of clerks. The clinical workload on the service is high for attending physicians, residents, and clerks, and this inevitably creates tension between providing clinical service and education in general, and assessment in particular. Second, it is the only rotation at Queen’s University where all clerks will be based at the same site (Kingston General Hospital) for the duration of the course, and this will allow me to explore the issues pertaining to this site in depth. Finally, the course director (Dr. Bond) for the Core Internal Medicine course is very interested in improving the internal medicine clerkship course in general, and he was very receptive to this study.
Table 1

Data Collection Plan

<table>
<thead>
<tr>
<th>Question</th>
<th>Participants</th>
<th>Methods</th>
<th>Purpose and timing</th>
<th>Sample Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What are current conceptions of FA and learning, especially as these are being formulated in medical education?</td>
<td>Literature review of: concepts of FA, FA in clerkship, and theories of learning applying to clerkship</td>
<td>To understand concepts of FA and learning from the literature, in order to have a framework to analyze the data from questions 2 through 4</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>2. How do clinical supervisors and clerks in the internal medicine clerkship course describe the role of assessment in learning?</td>
<td>Volunteer clerks in Block 2 and Block 8 of clerkship, taking their Core Internal Medicine course</td>
<td>Semi-structured interview</td>
<td>To understand clerks’ concepts about the role of assessment in learning before they start the rotation</td>
<td>Describe how you learn best with respect to learning to become a doctor. (Probing) What role do assessment strategies or practices play in your learning?</td>
</tr>
<tr>
<td></td>
<td>Clinical supervisors (residents and attending physicians) supervising participating clerks</td>
<td>Semi-structured interview</td>
<td></td>
<td>Describe your approach to supervising clerks. (Probing) Think of clerks you have supervised recently. Describe how you assessed their performance.</td>
</tr>
<tr>
<td>3. To what extent is FA integrated into learning in the internal medicine clerkship course?</td>
<td>Artifacts (assessment forms, policies)</td>
<td>Weekly on-line questionnaire</td>
<td>To understand how FA is intended to occur in this course</td>
<td>Think back on this week, and describe 1 or 2 positive experiences and why they were meaningful to you. Describe the factors that contributed to this positive experience and how they contributed.</td>
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<tr>
<td></td>
<td>Volunteer clerks, as above</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. To what extent do clerks completing this clerkship course recognize and value current strategies of FA?</td>
<td>Volunteer clerks, as above</td>
<td>Focus group</td>
<td>To understand what clerks recognized as FA in their Core Internal Medicine course and what was valuable to them.</td>
<td>How did this course support or facilitate your learning? How have you determined you’ve been successful in meeting the learning objectives (or your objectives) for the rotation? Describe your midterm assessment. Discuss how it was or was not useful for your learning. Are there opportunities for formative assessment in this course? (Probing) What are they, if so? How did they affect your learning?</td>
</tr>
</tbody>
</table>

*Note: FA=Formative assessment*
Selection of Participants

There were two main groups of participants: current clerks (in the classes of 2012 and 2013) and current supervisors of clerks, which include attending physicians and residents.

Clerk recruitment.

Two sets of clerks were recruited: clerks in the class of 2012 who finished their clerkship with Core Internal Medicine in March and April 2012 (experienced clerks in Block 8) and clerks in the class of 2013 who had their Core Internal Medicine as their second core block in April and May 2012 (novice clerks in Block 2). The decision to recruit novice and experienced clerks was a purposeful sampling approach, to permit exploration of clerk experiences and perspectives on assessment at either end of the clerkship, in order to evaluate what differences and similarities might exist.

I emailed all clerks in each cohort approximately 4 weeks before they started the course, and the email outlined the rationale for the project and what was required from clerk volunteers. In Block 8, four clerks volunteered out of 12, and in Block 2, 11 clerks volunteered out of 12. By random chance, the four Block 8 clerks were only on two of four Clinical Teaching Units (CTUs), with two clerks per CTU. Since 11 of 12 Block 2 clerks agreed to participate, they were distributed amongst all four CTUs.

Supervisor recruitment.

Attending physicians and residents who are working with the clerks during their core internal medicine clerkship were approached about the study via email outlining the study and the requirements for participation, with the endorsement of the Core Internal Medicine clerkship course director. The goal was to recruit purposefully a sample of attending physicians and residents who were working directly with the clerks who are participating in the study, in order to explore their perceptions of assessment of clerks. I emailed nine attending physicians individually at different times between March and July 2012, depending on when they were supervising participating clerks. Only one attending physician did not reply.

Residents proved to be much more challenging to recruit. Despite several email requests in March and April 2012, I only heard back from one resident, but I was unable to schedule an interview with him before he moved out of province for an elective, and then he did not reply to two subsequent emails. After discussion with Dr. Bond, we agreed I would email again to specific residents later in the year, once they were done their CTU rotation. In late June 2012, I emailed three residents who knew me personally, and one interview was arranged. (The other two
residents agreed to be interviewed, yet failed to reply to subsequent email messages.) Finally, on July 13th, 2012, I asked the Internal Medicine Program Director for recommendations, and, with his endorsement, I was able to recruit the three new chief residents, all of whom were chosen for this position for their skills and interest in teaching, and one other participant, who had only just finished his residency the week before, and thus would still provide the perspective of a resident.

**Data Collection**

A table summarizing the data collection plan and rationale for my five questions is included in Table 1. Question 1 has been answered in detail in Chapter 2. Details about data collection strategies for Questions 2 to 4 are included below.

**Semi-structured interviews.**

Question 2, “How do clinical supervisors and clerks in the internal medicine clerkship describe the role of assessment in learning?” was addressed via semi-structured individual interviews with clerks and supervisors. The purpose was to permit me “to enter into the other person’s perspective” (Patton, 2002, p. 343). A secondary purpose of the interviews was to introduce the study in a one-on-one setting. At the initial meeting, I highlighted that the study had received approval by the Health Sciences Research Ethics Board (Appendix F). Each participant was given a copy of the appropriate Information Letter (Appendix G), either in person or by email. I asked the participants to sign a consent form (Appendix H), and reviewed that their participation was voluntary, and that they could refuse to answer any question or withdraw at any time. I explained that their identity would not be revealed during any part of the process, and that I would use pseudonyms to ensure confidentiality. All participants agreed to proceed with the interview and to be recorded. An interview guide was used “to ensure that the same basic lines of inquiry are pursued with each person interviewed” (Patton, 2002, p. 343). All interviews were digitally recorded to permit verbatim transcripts. I completed 15 clerk interviews, 5 resident interviews, and 8 attending physician interviews.

**Clerks.**

I designed the clerk interview to permit me to learn about clerks’ perceptions and experiences with assessment and learning prior to starting the Core Internal Medicine course. At a mutually convenient time, I met with the clerks in person or I contacted them by phone. The timing for all interviews was chosen to avoid having the clerks miss any required course or clinical work. For Block 8 clerks, I carried out all interviews in person, at a time and place of the clerk’s choice, between February 29th, and March 4th, 2012. Since all Block 2 clerks were out of
town on electives prior to starting their Core Internal Medicine course, I carried out these interviews by phone between April 3rd and 15th, 2012. I recorded all interviews, but in one instance, the recorder malfunctioned during the interview, so I made detailed notes immediately following the interview. Selected sample questions are included in Table 1, with further details included in an interview guide in Appendix I. All interviews lasted approximately 15 minutes.

**Supervisors – attending physicians.**

I interviewed participating attending physicians once, at a time and place of their choosing. I had hoped to interview them during their period of supervision on CTU, but this proved to not be possible due to their busy schedules. I carried out the interviews within a three-month period after the supervisor finished their time on CTU, with early interviews taking place in March 2012, and the last interviews taking place in July 2012. All eight attending physicians were interviewed in person, in their office, by their choosing. The interviews ranged in length from 10 to 25 minutes and were recorded. The rationale for this interview was to understand the supervisor’s concepts of assessment and learning, with specific reference to clerks. Sample questions are included in Table 1, with details included in the interview guide in Appendix J.

**Supervisors – residents.**

I interviewed participating residents once, at a time of their choosing. I had hoped to interview them during their period of supervision on CTU, but, as described previously, this was not possible. I conducted the interviews in July 2012, which was no more than three months after they supervised participating clerks. All resident interviews except one were conducted by phone due to residents’ schedules. In one instance, the sound quality of the recording during the interview with one resident was very poor, so I made detailed notes immediately following the interview. The interview durations ranged in length from 10 to 15 minutes. Sample questions are included in Table 1, with details included in the interview guide with in Appendix K. The rationale for this interview was to understand the residents’ concepts of assessment and learning, with specific reference to clerks.

**Weekly on-line questionnaires.**

Question 3: “To what extent is formative assessment integrated into learning in the internal medicine clerkship?” was addressed via two methods: weekly on-line questionnaires answered by participating clerks, and by document analysis. The on-line questionnaires will be discussed first. After the first interview was completed, with the recorder off, I introduced the electronic questionnaire they were to complete weekly to document their
experiences with assessment and learning that week. To ensure that they understood the purpose of the questionnaire, I asked them to answer the guiding questions based on their previous week’s experiences, even though they had not yet started Core Internal Medicine. We discussed their answers, and I probed for clarification, until I was comfortable they understood the rationale for the survey and the types of answers I was seeking. Clerks understood that the questionnaires would be anonymous, in that I had no way of knowing which entries were from specific clerks, unless they chose to self-identify. Sample questions for the clerk questionnaires are included in Table 1 and details are included in Appendix L. On a weekly basis, I sent clerks an email with an electronic link a SurveyMonkey™ questionnaire for that week on Friday, and a reminder email with the link on Monday morning, to remind any clerks who might have forgotten.

The rationale for choosing weekly questionnaires was to provide clerks with a prompt to reflect on a week’s experiences with learning and assessment, to capture their experiences on a regular basis in a busy clinical rotation. The question prompts served the same purpose as an interview guide in a semi-structured interview, namely to “ask questions to elucidate and illuminate that particular subject” (Patton, 2002, p. 343). These weekly questionnaires addressed clerks’ individual experiences with assessment and learning in the clerkship, whereas the artifacts addressed what the intent is for formative assessment in the clerkship, and these will be discussed next.

Artifact collection.

I collected artifacts, namely all relevant policies, procedures, and forms that pertained to assessment in the clerkship for the purposes of artifact analysis. The rationale for this was to explore how formative assessment was intended to occur in the course. These are all available for download on various Queen’s University School of Medicine websites, although some are password protected and thus only accessible to clerks and faculty in the School of Medicine. Table 2 lists the artifacts retrieved, and their source. I verified with Dr. Bond (personal communication, August 16, 2012) that I had all relevant artifacts.

Focus groups.

Question 4, “To what extent do clerks completing this clerkship recognize and value current strategies of formative assessment?” was addressed via focus groups carried out near the end of the Core Internal Medicine course. I conducted two focus groups (one each for Block 8 and Block 2) with as many of the participating clerks as possible. The rationale for the focus group was to explore clerks’ experiences with assessment and learning retrospectively, just as they were about to complete the course. A focus group format was chosen to have a setting
for clerks to “consider their own views in the context of the views of others” (Patton, 2002, p. 386). The intent was to have clerks “both query each other and explain themselves to each other” (Morgan, 1996, p. 139), once they had nearly completed the block, to build on their individual responses in the weekly questionnaires.

Table 2

Artifacts Collected For Analysis, Including Sources

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Source</th>
<th>Password protected?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Evaluation, Progress, and Promotion Policies</td>
<td>Queen’s University School of Medicine, 2011c</td>
<td>No</td>
<td>Overall assessment policy for the entire undergraduate program</td>
</tr>
<tr>
<td>Student Assessment During Clerkship Policy</td>
<td>Queen’s University School of Medicine, 2011b</td>
<td>Yes</td>
<td>Assessment policy specific to clerkship courses.</td>
</tr>
<tr>
<td>Medicine – Core Course page; Assessment section</td>
<td>Queen’s University School of Medicine Core Internal Medicine 2012b</td>
<td>Yes</td>
<td>Assessment plan for the core internal medicine course.</td>
</tr>
<tr>
<td>Core Medicine Final Assessment Form</td>
<td>Queen’s University School of Medicine Core Internal Medicine 2012b</td>
<td>Yes</td>
<td>Assessment form (final) for Core Internal Medicine</td>
</tr>
<tr>
<td>Mini-PEX</td>
<td>Queen’s University School of Medicine Core Internal Medicine 2012b</td>
<td>Yes</td>
<td>Mini-PEX</td>
</tr>
<tr>
<td>Clerkship Mid-Rotation Evaluation Form</td>
<td>Queen’s University School of Medicine Core Internal Medicine 2012b</td>
<td>Yes</td>
<td>Clerkship-wide mid-rotation assessment form</td>
</tr>
<tr>
<td>Core Medicine Mid-block Assessment</td>
<td>Emailed to me by Dr. Bond</td>
<td>N/A</td>
<td>Dr. Bond’s new Mid-block assessment form</td>
</tr>
</tbody>
</table>

For Block 8, all four clerks were able to participate in the focus group, carried out on the last Monday of the rotation. For Block 2, 8 of 11 clerks were able to participate in the focus group, again carried out on the last Monday of the rotation. The other three clerks were either on-call or out of town. They were asked if they wished to be contacted for a follow-up interview, and they declined.

At this point, I engaged a current M. Ed student at Queen’s University, with experience in focus groups, to assist. Prior to the first focus group, I met with her, and provided background information on my study and the rationale for the focus group. Together, we reviewed my draft questions and subsequently, I made edits. Selected focus group questions are included in Table 1 and all questions are included in Appendix M.

The focus groups took place in a small group room in the New Medical Building at Queen’s University, from 5:00 p.m. until 6:30 p.m., approximately. I chose this location because it was familiar to clerks and convenient for them while being removed from their workplace environment at the hospital. Clerks were provided with supper at
the beginning of our meeting time, as they were coming to the focus group directly from work. This sharing of a meal also allowed the clerks a period of transition from a busy workday to a quiet focus group setting. All clerks have known each other since the beginning of medical school (three or four years ago); however, it was the first time the clerks were together for the purposes of the study, but they admitted they had spoken to each other about their involvement in the study prior to the focus group.

After the meal finished, the research assistant placed number cards in front of all participants to facilitate tracking of responses. I had written the four focus group questions on a white board in the room, so that all participants could see all four questions while eating their meal. This permitted the participants to understand the scope of the focus group, and to formulate some answers before the focus group started.

I reviewed the goals of the focus group, and, with participant consent, turned on the recorders, located strategically close to all participants. I asked questions and probed answers as required, and the research assistant took notes, and indicated which clerk spoke in which order, to facilitate transcription. Once no new themes were emerging for any one question, the research assistant read her summary notes aloud, so that the clerks could clarify or add further comments. I made notes as well, but these focused more on areas that I wished to return to later, or to note points that I would clarify afterwards. The Block 8 focus group lasted 69 minutes, while the Block 2 focus group lasted 53 minutes.

Researcher Log

I maintained both an electronic and paper log throughout the study, to record interview dates, my reactions to interviews and other events, thinking processes while analyzing, and other thoughts, as recommended by Stake (2010).

Data Analysis

Participant data.

I used an inductive analysis approach to my data analyses for all participant data, as I was “discovering patterns, themes and categories” in my data (Patton, 2002, p. 453), as part of a process of beginning with “specific observations” and “building toward general patterns” (p. 56).

Preparing and organizing data.

A transcriptionist transcribed all digital recordings (interviews and focus groups) verbatim. Subsequently, I listened to each recording while carefully reading the transcript to verify accuracy and to correct any errors. This also
provided an opportunity for me to “get immersed in the data” (Patton, 2002, p. 441). The questionnaire data was downloaded from SurveyMonkey™ to a spreadsheet and then formatted for ease of reading, prior to my reading all responses. All these data were organized by type (interview, questionnaire, focus group) and by source (Block 8 clerks, Block 2 clerks, residents and attending physicians), and uploaded into the qualitative software program NVivo 9, as individual files, organized in folders (Appendix N). This organization ensured that “coding (was) facilitated” (McMillan & Schumacher, 2010, p. 369).

**Developing and reviewing codes.**

Because these two steps were intertwined, I shall describe them together. My first step was to develop codes for my data. I chose to start with the initial interviews in Block 8, as this was the first step of data collection. As I read through the transcripts again in NVivo 9, I developed codes that were “names or phrases that provided meaning to the segment” (McMillan & Schumacher, 2010, p. 371). I repeated this process with the rest of the Block 8 clerk data (questionnaires and focus group), and I developed new codes where new themes emerged from the data. As the process continued, codes began to repeat often, and saturation was eventually achieved and only very minor new codes emerged. Within each of these data sources (interviews, questionnaires, and focus group), I had 42, 40, and 56 codes respectively.

The second step was to review all of the codes from Block 8 data from the three sources (interviews, questionnaires, and focus group), and I noted inadvertent duplication (e.g., “clerk as learner” and “clerks as learners”) so I merged codes where appropriate. When I merged the codes from the three sources, there were frequent duplications, and these duplicate codes were merged. I also reviewed the quotes associated with each code, and this revealed other redundancies, so more codes were merged. In the end, I had 78 distinct codes from my Block 8 data, and this is described in Table 3. I repeated this process identically with the Block 2 clerk data, and the number of codes is included in Table 3. Most codes (70) were identical to the codes from the Block 8 data, but there were 13 new codes that emerged, and 8 codes from Block 8 were not found in the Block 2 data (see Table 3).

For the resident and attending physician data, I repeated the process as above except that there was only interview data to analyze. From the resident data, 39 codes emerged. When I reviewed the quotes associated with these codes, 1 code was found to be redundant, which resulted in 38 codes. Of these, 32 codes were duplicates of clerk codes, but 6 new codes emerged. There were 62 codes emerging initially from the attending physician data, of
which three were found to be redundant, resulting in 59 codes. In this case, 53 codes were duplicates of clerk and resident codes, but 6 new codes emerged. In the end, there were 104 codes from all data sets.

Table 3

*Clerk Data – Code Development and Revision*

<table>
<thead>
<tr>
<th></th>
<th>Block 8</th>
<th></th>
<th>Block 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Interview</td>
<td>Questionnaire</td>
<td>Focus Gr.</td>
<td>Interview</td>
</tr>
<tr>
<td>Initial codes</td>
<td>42</td>
<td>40</td>
<td>56</td>
<td>59</td>
</tr>
<tr>
<td>Total after “within block” merge</td>
<td>79</td>
<td></td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>Total after “between blocks” review</td>
<td>78</td>
<td></td>
<td></td>
<td>83</td>
</tr>
<tr>
<td>Codes unique to the block</td>
<td>8</td>
<td></td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

*Developing categories and themes.*

I started the development of categories and themes with Block 8 clerk data, the first data collected and coded. I wrote the codes on cue cards, and started by putting cards with similar codes together (e.g., “Feedback from residents” and “Feedback from attending physicians”). Many codes naturally formed categories in this way. For the codes that did not naturally form categories, I re-read the quotes, and then either the category was clear, or I created a new category. Ultimately, I had nine labeled categories. These nine categories were examined and four themes emerged. I used a recursive process that involved “repeated application of a category to fit codes and data segments” (McMillan & Shumacher, 2010, p. 377). Since the codes were very similar between Block 8 and Block 2 data, the same process was carried out, and the same categories and themes emerged.

For the resident and attending data, I used the same process as for the clerk data. The same themes emerged, although within certain categories, the codes differed, based on the differences described above, where new supervisor codes had emerged, and many clerk codes were not present in supervisor data. For example, a code that emerged from the attending physician data related to their faculty responsibilities, whereas this did not emerge from the clerk data. However, it clearly still fell under the category of working and learning environment, as these responsibilities were felt by faculty to affect their working environment. Similarly, the notion of faculty development
did not emerge from the clerk data, but it emerged from the attending physician data, mostly around attending physician’s desires to learn more about how to teach and assess clerks, so it fell naturally into the educational strategies theme. Thus, there were some differences in codes and categories between the clerk and supervisor data, but ultimately, the overarching themes were the same.

Artifact analysis.

My approach to the artifact analysis was to start by reviewing the overarching policies that inform assessment in the School of Medicine, to determine how they address formative assessment and feedback, and to analyze how consistent they were with current concepts of formative assessment and feedback, and theories that might underlie these practices. This process was repeated for the artifacts specific to the Core Internal Medicine course, including the course’s assessment plan, and all current assessment forms in use. Throughout this process, I was also monitoring internal consistency between the different artifacts, to see if principles outlined in the overarching policies were reflected in the forms used in the Core Internal Medicine course, for example.

Issues of Trustworthiness

Several strategies were used to enhance trustworthiness throughout the study. First, I ensured that I saved all key steps in coding as separately named NVivo files, which acts as an audit trail. I dictated my thought processes using the digital recorder, as this better captured my thinking than a written record. Credibility techniques were used at various points in the study. First, except in the case of two interviews, interviews and focus groups were recorded, which permitted verbatim accounts, which is accompanied by a citation, indicating the participant where possible and the data source. For example, a comment made by Clerk A in block 8 during the initial interview is cited as (A8, I1). Descriptions of all citations are included in Appendix N. Second, I used multiple data collection strategies, including interviews, questionnaires, and focus groups, which allowed for “multimethod triangulation of data across inquiry techniques” (McMillan & Schumacher, 2010, p. 331). Third, in interviewing residents and attending physicians, I had triangulation of sources to check “the consistency of different data sources within the same method” (Patton, 2002, p. 556). Finally, I engaged another M.Ed. student (who is not involved in medical education) in peer debriefing. After I presented him with a list of my codes, I reviewed an interview with him to explain how I had coded the data. I then provided him with two pages of data from block 8 questionnaires. The results are included in Table 4, below. The overall average percentage agreement was 90.3% in this exercise. I am confident in my codes,
especially since the second rater did not come from a medical education background, and yet his codes were quite consistent with mine.

Table 4

Inter-rater Percentage Agreement

<table>
<thead>
<tr>
<th>Section</th>
<th>My codes</th>
<th>M.Ed. candidate codes</th>
<th>Percent agreement *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Developing role of doctor</td>
<td>Developing role of doctor</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Ownership for patients</td>
<td>Ownership for patients</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Role of resident</td>
<td>Role of resident</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Resident as teacher</td>
<td>Resident as teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Individual teaching</td>
<td>Individual teaching</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bedside teaching</td>
<td>Bedside teaching</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Role of resident</td>
<td>Role of resident</td>
<td>89%</td>
</tr>
<tr>
<td></td>
<td>Resident as teacher</td>
<td>Resident as teacher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-assessment</td>
<td>Self-assessment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Role of attending</td>
<td>Role of attending</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Learning by doing</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Role of resident</td>
<td>Role of resident</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Resident as teacher</td>
<td>Resident as teacher</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Team support</td>
<td>Team support</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Patient and family factors</td>
<td>Patient and family factors</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Individual teaching</td>
<td>Individual teaching</td>
<td>89%</td>
</tr>
<tr>
<td></td>
<td>Time factors</td>
<td>Time factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time to process</td>
<td>Time to process</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Confidence</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Resident as teacher</td>
<td>Resident as teacher</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Role of senior resident</td>
<td>Role of resident</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Role of attending</td>
<td>Role of attending</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinical load</td>
<td>Clinical load</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Role of resident</td>
<td>Role of resident</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>Resident teaching</td>
<td>Resident teaching</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Junior resident</td>
<td></td>
</tr>
</tbody>
</table>

a = (2M)/(N1+N2); where M is the number of times the coders agree, and N1 and N2 is the number of coding decisions each coder made.

Chapter Summary

In this chapter, I reviewed the rationale for a qualitative approach to my research questions. I described the methods employed to select participants, locate artifacts, and to collect and analyze data and artifacts. The next chapter provides my descriptive results by reporting on the participants’ stories.
Chapter 4: Descriptive Results

Description of the Participants

In this section, I provide an introduction to each group of participants: Block 8 clerks, Block 2 clerks, residents, and teachers. The goal of this chapter is to understand the background of the participants, including factors that may have influenced their experiences on CTU, their concepts of formative assessment, and their responses to the research questions. For the clerks, this includes their ultimate career goals (internal medicine or other discipline) and their background before medical school; for residents, this includes what program they are in, their stage of training, and any teaching they might have received about supervising clerks; and for attending physicians, it includes their years of experience, their discipline, and relevant faculty development they have received.

Block 8 clerks.

Block 8 is the last clerkship course, where clerks are about to finish their last degree requirements for medical school. Four of 12 Block 8 clerks volunteered for the study: three women, and one man. Three of the four clerks were 25 or 26 years old, which is a typical age at the end of medical school. The fourth participant was 32, and she was older due to having worked after her undergraduate degree, and having obtained a Master’s degree prior to starting medical school (A8, B8, C8, D8, I1). They had applied to residency positions, and they were waiting for Match Day, when they find out where they will be spending two to five years of residency. Of the four Block 2 clerks, two were applying to family medicine residency positions only and two were applying to family medicine and emergency medicine programs. Clerks doing internal medicine in Block 8 have ruled out internal medicine as a career choice, and they had chosen to complete internal medicine at the very end of clerkship as a result. If a clerk is interested in internal medicine as a career, he or she would have chosen a stream that allowed them to complete their internal medicine clerkship requirements early enough to experience internal medicine early enough in clerkship to finalize decisions about career plans and to obtain letters of reference for prospective residency programs.

The first day of Block 8 was also Match Day where graduating clerks find out where they will be attending residency. All four clerks matched to one of their top choices. Thus, for the rest of the rotation, the clerks no longer had to worry about their final assessment results in this course impacting their plans for residency. They still had to meet the standards set out to pass core internal medicine in order to graduate, however.
Block 2 clerks.

By contrast, Block 2 clerks were very much near the beginning of their clerkship. When they started Block 2, they had only completed one required clerkship course (Sub-specialty Medicine), and approximately eight weeks of electives. They were early in the process of finalizing their decisions about applying to residency programs. Of the 11 participants, 6 noted an interest in internal medicine as a possible career, in direct contrast to the Block 8 clerks. For these six clerks, the Core Internal Medicine Clerkship course is an important opportunity to determine if internal medicine is a career that truly interests them. All participants were between 24 and 27 years of age, which is again typical for clerks one year from finishing their medical degree. There were eight males and three females.

Block 2 clerks had yet to write their first NBME exam, which was looming at the end of block 2. They were aware that their final assessment results for Core Internal Medicine would be forwarded to all residency programs to which they chose to apply, along with other completed clerkship course results. Assessment results in Core Internal Medicine are particularly critical for any clerk applying to internal medicine residencies, but all residency programs will review internal medicine results, as its material is considered to be foundational for most residency programs. Upon finishing block 2, these clerks will complete six other core clerkship rotations, two back-to-class courses, and several more weeks of electives before graduating from medical school in just over one year.

Residents.

The five residents who agreed to be interviewed were in different stages of training. The junior resident was a first year male family medicine resident who had just completed eight weeks of a required rotation in internal medicine. Block 8 clerks in particular referred to him as having provided a great deal of teaching and support to them. He noted he was interested in teaching, and had sought out additional opportunities to learn about teaching, above and beyond the small amount offered by his program, and he expressed appreciation for opportunities to learn about teaching. Supervising clerks was something he did infrequently as a family medicine resident, but he reported he really enjoyed it (Dr. R1).

All three chief residents were female second year residents at the time they supervised participating clerks, and had just started their third year of internal medicine residency at the time of the interview. As previously noted, they were chosen as chief residents based by attending physician and resident vote, usually based on teaching and leadership skills. One resident had no formal teaching experience, and the other two had participated in the “Residents As Teachers” (RATs) program at Queen’s University, which is not a requirement for their program (Dr
R3_1, Dr R3_2, Dr R3_3). In their two years of residency, they had supervised clerks every time they were on a CTU service, for a total of approximately 32 weeks, in addition to occasional supervision on other rotations (Dr. R3_1, personal communication, August 22, 2012).

The final resident participant was a male who had completed five years of internal medicine residency and was about to start a new job as an attending physician. He logged many months supervising clerks first as a junior resident, then as a senior resident, and then as a junior attending physician, where a very senior resident is able to assume the role of the attending physician for training purposes, but he couldn’t provide a more precise estimate. He had always had an interest in teaching, and also participated in a “Residents As Teachers” course twice, by his choice. His chosen career path as an attending physician is to be a medical educator (Dr. R5).

In summary, the resident experience varied from the limited exposure to clerks of a fairly junior first year resident to five years of exposure for the fifth year resident who had completed his training. They all self-identified as having a particular interest in teaching, and, with one exception, had sought out further training about teaching on their own.

Attending physicians.

There were eight attending physicians participants, including two females and six males. Overall, the mean number of years of supervision was 5 years, ranging from a low of 1 year to a high of 29 years, with 3 of the supervisors reporting 18 years or more of experience. One physician spends only four weeks a year on CTU, whereas the rest spend 8 to 20 weeks per year on service (in two-week blocks). Only two of the eight physicians supervised clerks in other settings regularly. Five of the eight physicians are primarily affiliated with the Division of General Internal Medicine in the Department of Medicine at Queen’s University, and the other three are primarily affiliated with other specialty areas, including critical care medicine, respirology, and cardiology.

All physicians have other responsibilities at Queen’s University. Dr. Bond was interviewed as an attending physician on CTU, but he is also the course director for Core Internal Medicine. (For reporting purposes in the data analysis, Dr. Bond is de-identified as the course director, and is simply referred to as one of the participating attending physicians.) Three other physicians are program directors for post-graduate medical education, and one is a former program director. The newest physician has just started an M. Ed. Three physicians have significant research portfolios. Because of the comparatively small nature of the Department of Medicine at Queen’s University, no
further details can be reported about the attending physicians without compromising their confidentiality, even with pseudonyms.

In summary, the eight attending physician participants varied considerably in experience and background. There was also considerable variety as to whether education was a focus to their career, as opposed to more traditional medical research pursuits.

**Chapter Summary**

In this chapter, I described the participants of my study. This information provides a rich description of the individuals and groups who informed this study and also the conditions that likely influenced their orientation to formative assessment and responses to my questions. Those interested in my research and my findings are encouraged to assess the degree to which these participants and this setting are comparable to others, as it will vary considerably with different disciplines, different models of care, and differing faculty structures. In Chapter 5, I will describe my findings from the data collected from the participant groups and from the artifact analysis.
Chapter 5: Analyses of Results

In this chapter, I provide my analyses of the results of the clerk and supervisor data, and of the artifact analysis. Although my research questions are concerned about concepts of formative assessment, participants only rarely used the term “formative assessment” in their interviews, questionnaires, or focus groups. However, concepts relevant to formative assessment were present in most of the data. As such, I will provide an analysis of the overall themes in this chapter, and link these to concepts of formative assessment and theories that might underlie formative assessment in a clerkship setting. Once I have discussed these analyses, I will review the multiple perspectives of formative assessment provided by the participant groups and specifically address research questions 2, 3, and 4 in Chapter 6.

I start by presenting the results of my analyses of the clerk data, both what was similar and different between novice and experienced clerks. I then analyze the supervisor data, again looking at similarities and differences between attending physicians and residents. Although both attending physicians and residents supervise clerks, residents are also learners and being supervised by the attending physicians, so their perspectives may differ. I then provide my analysis of themes across all groups, which will be looking to see how clerks’ perspectives align with those of their supervisors. Finally, I provide the results of my artifact analysis and discuss how it relates to the participant data.

Clerk Results

There were four themes that emerged from both the Block 8 and Block 2 clerk data: the Developing Role of Doctor, Team Factors, Working and Learning Environments, and Educational Strategies, and each will be described in detail below. I will expand on each theme, and highlight where Block 8 and Block 2 clerks agreed and differed on key points.

Developing role of doctor.

Both groups of clerks describe what I refer to as their developing role of doctor. At the end of their medical school curriculum, Block 8 clerks were very explicit about this role:

I think at the end of our training, it becomes so much easier to really go from start to finish and try to manage the patient, work through the social issues, work on a discharge plan, speak to families, their physicians – everyone – and feel like truly, you are responsible for the patient and I know for a couple of patients at least, I felt like I’m their doctor. (F8_1, B8)
One clerk commented: “This week, I started to feel more secure with writing orders for common medications (diuretics, pain management, bowel routine, etc.), and definitely felt more comfortable about my roles and responsibilities as a clinical clerk in medicine,” (Q8_2). These clerks are starting to provide a fairly complete description of what a doctor’s roles are, above and beyond simply assessing patients and providing recommendations.

Block 2 clerks describe a less sophisticated role of doctor, reflecting their earlier stage of training:

Yeah, I don’t feel lost like in most… in most like situations. Like I can develop some kind of approach or plan to most problems that I see. Even if it… Like even if it’s kind of wrong but I’ll be on the right track or at least… or at least now, I know how to ask more and more of the right questions to figure out like how to at least you know describe the problem correctly and that’s like a big part of kind of… You can always look up how to manage it afterwards but you need to get the right information first. (F2_1, C2).

This highlights an earlier concept of the role of a doctor, focusing mostly on the immediate patient-doctor interaction. Clerks are identifying their own gaps in knowledge and skills and are starting to develop strategies to address these. These descriptors are consistent with the theory of communities of practice, both novice and experienced clerks are ‘learning by doing’ (Lave & Wenger, p. 31), and the experienced clerks have already moved from more peripheral participation to legitimate participation.

Confidence.

While both groups expressed increasing confidence in their role as a doctor, Block 8 clerks had more confidence, congruent with their finishing their clerkship: “I’m more kind of getting like: Ok, if I see a patient and I’m you know, I’m actually managing them - you know with some supervision – having people agree with my management” (F8_1, C8), even in the face of increasing complexity: “I was following a complicated patient in the ICU and felt good about my assessment and management plan for a challenging issue” (Q8_3). The clerks here are also self-assessing, and they might be receiving implicit feedback about their assessment and management plans, in that they report that others are agreeing with their plans.

Block 2 clerks were gaining confidence to make the decisions and practice the skills identified as appropriate for their experience in the clerkship. One clerk provided an explicit example of his developing confidence in his role as a doctor:
I had a moment this week where I truly felt like I had moved from a gatherer of information to an interpreter of the facts in front of me. I admitted a patient for a [gastrointestinal] bleed, and as part of her [emergency department] work-up she had an x-ray of her abdomen. Prior to meeting the patient, I was reviewing the x-ray and was able to note that she had clearly had a hip replacement, and a rod in her back from scoliosis. This reminded me to ask about medications she uses for pain, and discover that she takes NSAIDs every day [a risk factor for bleeding]. (Q2_3)

Again, this is a comment about self-assessment and reflection; this clerk was aware of a change in his clinical approach, moving him from simply information gathering to information interpreting and proactively identifying issues. He was engaging in “self-monitoring of [his] effectiveness” (Zimmerman, 2008, pg. 167) in an active manner on his own. Of note, he did not comment on any external feedback on this experience from a supervisor.

Ownership for their patients.

Block 8 clerks were much more explicit in their a sense of ownership for their patients, as part of this developing role, compared to Block 2 clerks: “This week, I felt in control and responsible for one of my patient's health and illness experiences,” (Q8_2). They noted that this was sometimes a surprise to their supervisors, as they had already matched to their residency of program of choice, and thus, they felt there was an assumption they would be less engaged: “Yeah, it was so much fun when people are like: ‘Oh, you’re post-CaRMS. [Clerks knew they had matched to a residency program] You’re probably not going to work very hard.’ I’m like: ‘I have patients I have to take care of!’” (F8_5, A8). They viewed their ownership of their patients as part of their developing role of doctor, which was increasing in importance to them.

By contrast, and not surprisingly, Block 2 clerks were just starting to experience a feeling of ownership for their patients, which was cited as a strength in the core internal medicine course: “the internal medicine rotation is excellent for including clerks in the care process, rather than just having them observe” (Q2_2). A Block 2 clerk provided a typical example:

This week I saw the impact of continuity of care. I have been looking after a woman for the past 4 weeks and have seen her through critical illness to recovery and now we are looking only at physical rehabilitation. The bond we have created has encouraged her to stay motivated, and daily issues are easily dealt with due to an ongoing trust of one another. (Q2_4)
Overall, both sets of clerks described their developing sense of their role as doctors, but Block 8 clerks had a more sophisticated description of what this entails, congruent with their stage of training and what one would expect from more time in the community of practice. The Block 2 clerks are starting to build on this concept, even at a very early stage of clerkship. The data support the assumption that novice clerks appear to have different learning needs than experienced clerks. This might also imply a need for either different types of formative assessment, or, perhaps a different focus for formative assessment and feedback, depending on the stage of training.

**Role of the team.**

Clerks frequently cited the role of the team as having a significant impact on their learning and different aspects will be discussed here.

*Clinical Teaching Unit (CTU) structure.*

Both Block 8 and Block 2 clerks identified the role their CTU team played in their learning in both positive and negative ways. These comments often overlapped with comments about *CTU structure*, and examples of both are presented here. A Block 2 clerk described the effect of a strong team experience:

> I think the biggest influence is who your staff is, and who your senior is. I had a great staff and a great senior. They were awesome about teaching (they gave lessons on good approaches to common problems), giving feedback, letting us learn and try things, and not belittling us. They had high expectations but weren't mean if we didn't know answers. The biggest thing, though, is that our team was FUN. It was, like, a team. (Q2_3)

This clerk is describing a very positive learning environment that, in addition to providing teaching, appears to embed the role of feedback (and possibly formative assessment), which is clearly appreciated by the clerk.

Other comments highlighted challenges in the structure and the effect this had on patient care. A Block 8 clerk provided a very clear example:

> Additionally, as our team switched attending physicians TWICE during this one week, it was a challenge to pursue consistent care of my patients, and even more so to describe to the patients and their families that the new staff was as updated as the one who had left. Both of my dying patients have now been through three different attending staff! (Q8_3).

Although not highlighted by the clerk as much as her concerns about patient care, the effect of frequent attending physician turnover on the clerk’s learning must be considered. It is an example of how it could be very challenging
for the attending physician to provide formative assessment and feedback and for the clerk to interpret it, with so little contact. The clerk is also clearly frustrated with the care system overall, which might well play a role in her perceptions of the learning and assessment experienced in this milieu. This experienced clerk is, however, engaging in reflective practice, especially “reflection in action” (Schön, 1987, p. 35), although there appears to be no one who could act as her coach or teacher in this setting.

**Role of the attending physician.**

The role of the attending physician was identified as having either positive or negative influences on their team learning experiences, with no differences emerging from the analysis between groups. One Block 2 clerk describes a positive team experience related to how an attending physician approaches teaching:

Our attending quizzes the clerks first and then the [first year residents] and continues up the chain. This is good because it allows each individual to be pushed within their expected knowledge level. The attending also doesn't continue to pressure one person about something they clearly are unfamiliar with. This is good in my mind because you don't end up feeling embarrassed or nervous so you are able to focus on learning what you didn't know and not worrying about how you look. (Q2_2)

This clerk is describing an experience that incorporates concepts relating to the zone of proximal development, where he describes being “pushed within (his) expected knowledge level” (Q2_2). In addition, the model described above is consistent with a community of practice, where it is explicit that clerks are moving from peripheral to legitimate participation.

By contrast, a Block 8 clerk articulates how some pleasant attending physicians can still have negative impact on the learning experienced within a team and ultimately on patient care:

My attending physician was extremely nice and created a pleasant team environment, however I only saw him to [discuss patient issues]. There was no group rounding on patients and he did not do any teaching. I asked him to see one of my patients who I was concerned about and unsure about my physical exam findings, and he told me he didn't have time. (Q8_2)

This clerk was using self-regulated learning skills in that she had self-assessed and identified concerns about her physical exam findings, and she appropriately asked for feedback, but did not receive it. This lack of feedback concerned her mostly in terms of patient care (appropriately) but also did not help her learning. She is trying to have more legitimate participation in her community, but she is describing barriers to this.
Role of residents.

Clerks identified the critical role of residents in their team experience, and how this affected their learning, both positively and negatively. This is a typical example of a positive experience with a resident from a Block 8 clerk:

I had two call shifts last week with the same senior night-float resident. She was fantastic. The first night, she took extra time with every consult to really think through the issues and come up with an approach to each one. She really made it an opportunity to learn. The second night, I realized that she would do this, so before presenting, I went a step further, and came up with my own differential diagnosis and what to do next to further define the diagnosis and then management. (Q8_2).

The clerk worked with a resident who supported his learning, then used self-regulation skills to build on this and improve his performance. Although assessment is not explicitly mentioned in the comment, some form of assessment by the resident could be implied, in order to generate the feedback, allowing the clerk to go “a step further” (Q8_2) on higher level tasks (e.g., generating a differential diagnosis which is a list of possible and probable underlying diagnoses to explain the presenting condition).

It appears however, that the disposition of the resident makes a significant difference in the learning that is possible within the team. A Block 8 clerk commented on this, specifically as she felt she was spending too much time on tasks that did not contribute to her learning, and seeing little leadership in the team was a real frustration:

The [third year resident] on the team was leading the team for this week rather than the [second year resident] while the [second year resident] was away. She did not seem interested in leading a team, and was less present to help with administrative affairs, which meant more time was wasted tracking down signatures, learning which paperwork was needed. (Q8_3)

Once again, there were no notable differences between how Block 8 and Block 2 clerks describe the role of residents.

Roles of junior and senior residents.

The two groups of clerks differentiated between the roles of senior and junior residents. Interestingly, Block 8 clerks, (who are almost junior residents themselves) commented more often and more positively on their interactions with junior residents, and how this affected their experience in Core Internal Medicine. One of the clerks gave a very specific example of how Dr. R1 was a helpful influence on her learning:
If you went to Dr. R1 and got him to… like you had orders, he wouldn’t just like sign them. They often were right but he’d be like: “But… but why? Why are you…” You’d have to explain why and then… I don’t know… and so if you could explain why and he’d like: “Yeah…” Then that was a way of knowing that you were on the right track. (F8_3, C8)

The clerk got immediate and relevant feedback on a common task in medicine: writing orders. As a self-regulated learner, she could then take this feedback and apply it to her next instance of writing orders. Once again, she does not explicitly identify this as formative feedback, but this appears to be what she is describing. Another Block 8 clerk commented: “that’s helpful a lot of time hearing feedback from like a first-year resident who just came from your situation and they often give really practical feedback and assessment” (F8_3, D8). This clerk is highlighting that junior residents are only one year ahead of senior clerks in clinical experience, and thus may be particularly well able to provide feedback in the zone of proximal development.

Block 8 clerks also appeared to understand the context of the junior residents, and thus really appreciated any help they provided: “We didn’t get much resident teaching from our senior residents. Ironically, it was… it came from our [first year residents], who are the ones who don’t have time to teach and most of it came while on-call” (F8_2, B8), again, perhaps referencing the fact that junior residents remember their experiences as senior clerks, and might remember how much they valued receiving teaching on-call. It is important to note that these comments should not be generalized to all junior residents, as the study focused on their experiences in a five-week period, and they may simply have had strong junior residents and weaker senior residents during this time frame.

One clerk provided a comment that was quite representative of what the Block 8 clerks experienced in terms of junior and senior residents:

It’s nice with junior residents ‘cause you, you - in many ways - learn alongside them but it’s amazing if it’s with like fellows [very senior residents] or attendings ‘cause then there’s opportunities for them to teach as you go along and that has been absolutely hands-down the best part. (D8, I1)

This clerk has provided a description of how communities of practice should work. There is learning from peers, near-peers, and from other members of the community, and this has provided the clerk with a valuable learning experience.

Overall, Block 8 and Block 2 clerks agreed that the role of the team had a very significant impact on their learning. Once again, there were only very few comments that explicitly addressed formative assessment, but many
comments implied the role of feedback was very important, and that team factors often impacted on the utility and frequency of feedback they received. Consistent with the theories of zone of proximal development and communities of practice, there were some differences in the comments from Block 8 and Block 2 clerks, who have differing concepts of their roles on the team, as expected by the difference in their levels of training.

**Working and learning environment.**

Clerks from both blocks identified the role of their *working and learning environment*, beyond just their teams, as having a significant impact on their learning.

**Clinical load.**

Both novice and experienced clerks described the role of their personal and team’s *clinical load* as having a direct impact on their experiences; specifically, this relates to the number and complexity of patients on their CTU. This can be a negative factor when things are quite busy:

Well, I think the patient load is a huge factor ‘cause once you get busy and your whole team gets busy, the residents don’t teach, like, they just want you to get things done. You don’t have time to learn and read around cases and you’re just kind of playing catch up the whole time. (F2_1, G2)

This clerk is commenting both on the lack of teaching from residents, but also on the lack of time for him to reflect as a self-regulated learner, in order to self-assess and focus his studies. Clerks also articulate how heavy clinical loads can create stress: “In the re-distribution of patients, I felt slightly overloaded with six patients, and felt unable to always give these patients the time they required” (Q8_4). The clerk goes on to explain: “As a result, I felt as though I was neglecting the needs of some of the other, equally complicated patients on my list” (Q8_4).

However, less busy services sometimes create different problems for clerks: “One of the residents only had 1 patient so he rounded on some of mine and then gave me a report on them and told me what the next steps should be” (Q2_1). This speaks to a resident circumventing the goals of the community of practice, where the clerk learns by doing. When commenting about less busy services, however, it was more common for clerks to note how being less busy contributed positively to their learning: “Our patient load this past week was manageable, so we had time for teaching sessions within our team” (Q8_3).

**Time factors.**

*Time factors* were frequently cited as challenging and often detrimental to learning; this linked to clinical load issues, but also to other competing time pressures. This Block 8 clerk describes a very positive experience
seeing a patient in the emergency department and reviewing the patient directly with her attending physician, when there were fewer time constraints:

The team was not swamped at that moment, so my attending was not in a rush. I had time after my assessment to think about what I found, read around the presenting complaint, and come up with a tentative management plan. This made me feel more prepared to present to my attending, which is likely why I got positive reinforcement on my history. (Q8_1)

This time allowed the clerk to reflect on her assessment of the patient and address some learning gaps before presenting to her attending physician, consistent with a model of self-regulated learning.

Clerks were also quite astute at discerning that time factors did not just relate to how busy the team was, but related to how time was used:

The biggest barrier to my learning is a busy service that lacks structure. … I am learning near to nothing by observing the conversation surrounding a patient that I have no involvement in, especially if no one is taking the time to highlight the poignant learning points. (Q2_3)

This clerk articulates a lack of attention to concepts around the zone of proximal development, as it is clear that the clerk felt unable to benefit from a conversation about other team members’ patients. There could be many reasons for this, but if the discussion was between the attending physician and the senior resident, who are experts compared to the clerk’s novice status, it might just be too far removed from the clerk’s level from him to appreciate. The novice clerk may still be dependent on “context-free rules to guide their task performance” (Benner, 1984, p. 403) and require more explicit support to appreciate the discussion about other patients. It could also be an example of where the peripheral participation of clerks might not be sufficient on its own to support learning in a complex environment.

This was a more common theme with the Block 2 clerks, as opposed to Block 8 clerks:

You realize you don’t know something and you, for whatever… you can’t find the time, you can’t find the time, you can’t find the appropriate… you’ve nobody to turn to to ask and you realize that you’re… and especially if you’re carrying like six patients and then you realize that that deficit you have is not readily addressed. (F2_2, D2)

This is a clerk who describes reflection in action, but is not given any supports to help him act on his reflections, either by way of time or feedback. Another clerk articulates a similar concern:
Learning by osmosis is fine, but we are still at a stage where the clinical judgment call that our seniors are making must be explained to us. Time needs to be taken with every decision to spell out for me why that is the decision that is being made over another viable option. (Q2_4).

Block 8 clerks also identified time factors as often negatively contributing to their working and learning experiences, but their comments focused more on the lack of efficiency, as opposed to not having time to get answers to questions: “A lot of time on CTU is spent waiting to review patients or have orders signed. If this were more efficient, there would be more time for learning” (Q8_1). At the latter stages of their clerkship, as self-regulated learners, experienced clerks might require less formal support around patient management issues, but they still value time to learn on their own.

Other health professionals.

In addition the medical team, clerks at times identified that other health care professionals affected their learning:

So definitely nurses because they’re extremely helpful and they will – again – help you learn a lot of the practical things that you need to know around the hospital. How to order certain things, where stuff is, you know, they definitely – in the mornings when you’re rounding – will fill you in on the patient from the night before. So they give you useful clinical information as well. (J2, I1)

However, at times these interactions were not positive:

Unfortunately, the nursing staff was a major barrier to my progress with my patient and the learning I could do around her. The lack of respect given to clerks and our inability to order any care ensured that I was viewed as a useless component to her care and meant that anything I asked for went unfulfilled and even ignored, all which were in the best interests of the patient. (Q2_4)

The first clerk is identifying how nurses might also be part of the community of practice; and they help him to move from peripheral participation towards full participation. By direct contrast, the second clerk describes an experience where he is actively feeling excluded from the community.

Administrative barriers.

The last comment about nurses also raises the issue of administrative barriers, as clerks require a resident or attending to co-sign their orders before they can be enacted. This policy, while in place for safety reasons, highlights the peripheral nature of clerks at times in patient care, which, in the context of increasing competence of
experienced clerks especially can be viewed as counter to the concepts of communities of practice. This clerk describes how she feels when she expresses her frustration at having to participate in too many activities that do not contribute to her learning, with no real explanation provided to her about why:

“I don’t like the whole thing: “Well, it’s just the way it is.” I don’t like that as a response. …. And I don’t even know if it’s just the way it is… What about the way it should be? Like they keep saying like it should be medicine… you know, you’re here to learn and if you’re here managing this and writing summaries, it doesn’t matter if they did that last year, it like… it shouldn’t be that way. (F8_4, C8)

The clerk goes on to describe comments from her team that detract from her work/learning environment: “[It would help] if we didn’t have comments from [most of our residents]: ‘I hate team medicine’” (F8_4, C8). This comment at the focus group prompted a peer to agree: “Yes! I was like … but this is what you do! …. Really, attitude affects a lot” (F8_4, B8).

Overall, clerks in both blocks clearly articulated the role of the working and learning environment in their learning. Most of the themes were similar between the two groups, especially around the role of the clinical load of the team and time factors, but there were subtle differences between the groups, in keeping with their different stages of training. Experienced clerks were more concerned with the lack of efficiency they saw on their team, whereas novice clerks were really struggling with time factors limiting their access to feedback and learning at a critical juncture in their training. Both groups articulated aspects of workplace culture that impacted their learning, but the Block 8 clerks described this in more detail. It is unclear, though, with just two sets of clerks, if this had more to do with specific team dynamics as opposed to being related to clerks’ levels of training.

**Educational strategies.**

The final theme that emerged from the clerk data was that of educational strategies, and their varying roles in their learning. Three categories emerged within this theme: teaching, assessment, and feedback.

**Teaching.**

Clerks valued different teaching methods, including teaching in different settings, and the particularly important methods are reviewed below.

*Clerk-specific teaching.*

*Clerk-specific teaching* was valued by both sets of clerks:
I like small group teaching on whatever block you’re on that’s aimed at clerks. So, kind of breaking things down to basics and going over general approaches to, you know, common problems that you see in that rotation and, you know, how to approach differential and putting out at a level that’s good for someone in our – you know – that’s a third or fourth-year clerk. (C2, I1)

Another Block 2 clerk explained further why this is useful to her: “Having the teaching aimed at just the clerks makes the topic of discussion more relevant to our level so it's easier to follow along and see the relevance of the information to our practice” (Q2_4). A Block 8 clerk provided specific comments about the formal clerk teaching sessions organized by Dr. Bond:

As always, these provide a chance to really dissect a case in a group setting. Also, one of the cases was presented by my team, so we thought about and researched the case well prior to further discussing in the group. (Q8_4)

The clerks are describing that teaching in the zone of proximal development is very beneficial to their learning. The Block 8 clerk was also alluding to self-regulated learning skills needed to prepare a case for teaching, which apparently contributed further to learning.

**Peer teaching and learning.**

Block 2 and Block 8 clerks also commented on opportunities for peer teaching and learning. One Block 8 clerk described a peer learning session as being a good opportunity for learning:

Worked with another clerk to discuss different types of renal failure prior to discussing the patient with the entire team. Good review of an important subject, and doing this prior to team discussion meant we could take that discussion even further. (Q8_4)

Another Block 8 clerk explains that teaching her peers helps her learning: “There’s a few instances in clerkship where I’ve actually gotten to um, like teach peers about a certain disease where, you know, that I saw and they might not have seen and that’s really helpful for me as well” (D8, I1). One Block 2 clerk noted that his best learning occurs in his peer group: “I feel like I learn best when I’m working with a group of peers so maybe, you know, discussing certain topics, discussing certain cases with my friends helps to consolidate that learning” (A2, II). These examples related to the clerks’ skills in self-regulated learning, where they are using “proactive processes … to acquire academic skill” (Zimmerman, 2008, p 166). They might also be able to identify one another’s zone of proximal
development, as they are in a peer-learning group, and adapt the teaching they are providing to their particular peer’s needs.

Bedside teaching, simulation sessions, and case-based teaching.

Bedside teaching, simulation sessions, and case-based teaching were described by all clerks as being very helpful strategies to support learning. One Block 8 clerk provides a specific example of bedside teaching that she found to be a good learning experience:

The cardiology attending …. brought us to the bedside to see a patient with mitral stenosis. We each listened to the patient once, then he pulled us aside and said: “Now, I’d like you to listen to for something specific on this patient.” The patient was willing, obviously. We listened again and then we went aside to a room and discussed the pathophysiology of what was going on, indications for treatment, causes for what… what the causes for her particular condition and then discuss it in the context of a patient. (B8, I1)

A Block 2 clerk also noted the value of bedside teaching in the focus group: “The bedside teaching that at least our team received really helped make your exam more efficient and clean it up from what we just learned at the beginning to really focus it on the clinical presentation for you” (F2_1, H2). These clerks are describing a community of practice, where they are learning by doing, and moving from peripheral participating towards more full participation (Lave & Wenger, 1991). Along a similar vein, clerks valued simulation sessions, which replicate aspects bedside teaching in a lab with simulation equipment, as opposed to real patients:

This past week our attending took the entire team to meet 'Harvey', the simulation model for the cardiac exam. I was then asked to work through my approach to the cardiac exam, and talk about the significance of certain findings (i.e., heart sounds, murmurs). It was the perfect opportunity to match the clinical picture with the pathology behind a disease, and a very valuable learning experience. (Q2_3)

Learning from the patients they see (case-based learning) is very valuable to the clerks. A Block 2 clerk noted the following:

The best part about CTU in terms of learning is being on call for ER consults. That is when the real learning takes place, because you get time to review the patient's chart, take a proper history, do a physical and lab assessment, and formulate a plan. Then you get a chance to review the case with the senior resident, who gives feedback and does teaching around your case. (Q2_1)

In this case, the clerk is describing a setting that promotes self-regulated learning. She appears to be able to
“selecting and deploying strategies” (Zimmerman, 2008, p. 167) around her learning as she assesses the patient, and then she receives feedback on her efforts, and receives further teaching. As well, she is participating in the community of practice, moving beyond the periphery as well at the same time (Lave & Wenger, 1991).

Overall, clerks appreciated and appeared to make use of many different teaching opportunities in their clerkship settings, not surprisingly, as it appears many teaching strategies were of high quality. No differences between the two groups emerged from the data.

**Feedback.**

Clerks commented at length about feedback, specifically about its value and how they used it, but also about challenges around the quality of the feedback in terms of timing, frequency and practical content (or lack thereof). The data revealed that clerks understand and recognize high quality feedback. This Block 8 clerk explains how feedback received was useful when it was specific and constructive:

I did a consult in the [emergency department] and was presenting to my attending staff. He gave me positive feedback about the presentation of my history, and constructively told me how I could have better presented my physical exam. I appreciated this advice, and it will help me in my roles as communicator and medical expert. (Q8_1)

Dr. Bond’s collated feedback at the mid-point of the rotation was rated as being very useful by clerks in both blocks, both in terms of timing and content:

One more thing that was great for this rotation was the opportunity to receive mid-rotation feedback. This was particularly good because we received the feedback after the senior resident and staff had known us for a couple of weeks, and so they could really identify our strengths and weaknesses. (Q2_3)

Many clerks described episodes of unhelpful feedback. This Block 2 clerk described frequent feedback as being stressful: “I think the most frequent that you should really be getting feedback is probably once a week. Any more than that and you’re just getting stressed out all the time about receiving feedback” (C2, I1). A Block 8 clerk noted he would appreciate more constructive feedback:

I think they could play a more valuable role if there was a little more critical criticism – constructive criticism – built into the assessments because I’m not getting very much of that and I don’t think it’s because I’m, you know, super-fantastic, I think it’s because: “Oh, you’re doing great.” People want to be
encouraging and but at the same time it’s like: Ok, but I’m also here to improve and if I’m only doing fantastic, then what do I have to improve on? (A8, I1)

He also notes that the timing of the feedback is important, specifically referring to when his Mini-PEX assessment done late in a rotation identified something he wasn’t doing accurately on physical exam, he asks: “What did I miss in the last two weeks ‘cause I wasn’t doing that” (A8, I1)? This clerk is demonstrating reflective practice when he considers the implications of not having his problem on physical exam identified earlier.

Overall, the clerks articulate that they seek what Nicol and Macfarlane-Dick outlined in 2006: good feedback that should “empower clerks as self-regulated learners” (p. 199). They recognize good quality feedback when they receive it, and are frustrated by feedback that is not helpful to them. No differences emerged between Block 2 and Block 8 clerks on the topic of feedback.

Assessment practices.

Finally, clerks described the role of assessment practices in their learning. Of note, this usually required me to ask a specific question about how assessment played a role in their learning because otherwise clerks did not describe assessment as playing a role in learning. However, when asked specifically, they commented on assessment practices providing varying degrees of support to their learning. Clerks usually commented on assessment forms, the Mini-PEX process, and logging their mandatory MCC presentations.

All clerks often found that assessment forms did not contribute to their learning, due to the lack of useful information on them. What follows is a representative comment, from a Block 8 clerk, in reference to the older forms that she had experienced in much of her clerkship (which were subsequently replaced by the forms currently in use and analyzed in this study):

I find a lot of the… a lot of the rotations they just act as attendance cards almost. I mean, I do appreciate feedback and I think that they… and I do take it seriously when I get it. Either… like good or bad or any, any kind of feedback but a lot of the time the Mini-PEX and the evaluation cards with checkboxes – I find them really hard to interpret and they don’t actually play very much of a role in how I… how I, you know, learn or change my behaviour over time. (D8, I1)

By contrast, a Block 2 clerk has found some of the assessment forms to be useful to her, especially the comments:

It kind of identifies your weaknesses and gives you an opportunity to figure out what you should be focusing on wherein at the same time it’s good to know: Hey, I’m doing this really well; so just to keep it
up. So I do find them very helpful. I have to admit I find the comments section on those assessments more helpful than sort of the ticky-boxes ‘cause with the comments, you know, they’re able to – the attendings – are able to sort of expand on their thoughts more and you get a better sense instead of, you know, just a ticky. (I2, I1)

An experienced Block 8 clerk identifies mandatory assessments as opportunities to reflect on progress, even if she doesn’t really enjoy the assessment process, if the attending physicians or residents provide good feedback:

When the staff or when the residents are good about filling it out, and make it a real learning exercise, I find that those, especially the Mini-PEXs, actually provide an opportunity to stop, reflect on our role as a learner, and ah, receive some really quality feedback about how we can improve that particular clinical encounter. (B8, I1)

Once again, as self-regulated learners, these clerks actively seek to make use of the assessment findings they receive, including incorporating reflection as they determine an action plan.

Interestingly, the only references to the NBME exam were made in the context of long hours they were working on the wards impeding their ability to study for the exam. Otherwise, there were no references to preparing for the exam as contributing to their learning. The reason for this did not emerge from the data. It is possible that the clerks don’t see the connection between their developing role of doctor and a written exam, but this is just conjecture.

Self-assessment.

While clerks usually didn’t actually ever use the term self-assessment, they often described using self-assessment skills in their learning. For example a Block 8 clerk explains how he used the logging process for mandatory presentations: “Having the MCC presentations sort of keeps in the back of my mind to what those foundation things like, things I have to know ‘cause… if I haven’t seen [a certain condition], you know, I need to go out and see it” (A8, I1). This Block 2 clerk describes a complex clinical scenario that prompted self-assessment and reflection:

I saw a patient who had been admitted for respiratory failure secondary to [medication] use for chronic pain. This case was very helpful for me because it lead me to read about respiratory failure and learn more about it. Furthermore, it was necessary to discuss with the patient the need to decrease the dose of [medication] and how it would be a better idea for her to start using different pain medications instead. This required
good communication with the patient to explain the side effects of [medication] use... In fact, before her discharge she was feeling less pain than before. For me, this case helped me in that I learned more about respiratory failure and how to better communicate with patients regarding changes to their pain management which can be often a very difficult topic. (Q2_1)

Once again, this is an example of self-regulated learning. The clerk noted a knowledge deficit after encountering a specific problem, and addressed that deficit. She reflected on the case and on other areas of learning, including communication skills around a challenging clinical problem. The main assessment practice described here is that of self-assessment. It is not known from the comment how her supervisors may have played a role in this experience, but it is noteworthy that she did not include any reference to them.

Overall, clerks discussed assessment primarily in the context of it being a mechanism for them to get feedback, especially with respect to assessment forms of different varieties. While they didn’t identify self-assessment when asked about how assessment affected their learning, it was clear from the data this is a skill they use frequently, consistent with their self-regulated learning skills. Of note, one the highest stakes assessment practices, writing the NBME exam, did not emerge from the data as having any role in their learning. No differences were noted between Block 2 and Block 8 clerks with respect to their views on assessment.

In summary, four themes emerged from the data with respect to clerk learning in the Core Internal Medicine course: the Developing Role of Doctor, Team Factors, Working and Learning Environments, and Educational Strategies. In general, the data from the clerks was consistent with relevant theories in the literature. Of interest, the term “formative assessment” did not emerge as being important in the clerk data, but components of formative assessment were described in all of the major themes. This will be revisited in Chapter 6 where the research questions about concepts and experiences of formative assessment will be discussed.

**Supervisor Results**

In this section, I present the results of my analysis of the supervisor data (residents and attending physicians), both what was similar and different between the two groups. Readers will note that the same themes emerged: the Developing Role of Doctor, Team Factors, Work and Learning Environments, and Educational Strategies, but within each theme there were some codes and categories that differed from the clerk data and many that were the same.
Developing role of doctor.

Clinical reasoning.

The developing role of doctor theme also emerged from the supervisor data. Supervisors often referred to the development of clinical reasoning skills as being core to becoming a doctor, and how they view it developing in clerks. This attending physician comments on how he teaches and assesses clinical reasoning skills:

Going over their histories and physicals to re-shape the scribing part into something that makes clinical sense and then… and then a big… I put a huge amount of emphasis with them – as I do with everybody – is in… is to take the information that they’ve gotten from what ever sources and coach them into forming it into a clinical vignette that, you know, kind of… is cohesive or coherent. (Dr. X)

Similarly, residents appeared to have a similar emphasis on clinical reasoning. Dr. R3_1 describes her approach:

I usually work with my clerks by asking them a lot of questions. So I ask them why they think we’re doing something or what they think is going on and seeing if they understand why we’re doing things and getting them to try and create plans. (Dr. R3_1)

Both of these supervisors are describing how they bring clerks into the community of practice that is medicine. They are also describing how they work in the zone of proximal development, as they provide the equivalent of their role in the clerk’s “problem solving under adult guidance” (Vygotsky, 1978, p. 86).

Ownership for patients.

The attending physician data also highlighted ownership for patients as being important, although this was not a theme that emerged from the resident interviews. One supervisor articulates the importance of this in his approach to supervising clerks:

I try to convey a philosophy to – particularly to clerks because their minds are nice and malleable at that point – and the philosophy is: If you’re a physician, you’re responsible for the patient’s care and you have to personally take responsibility for the care not just because you got assigned to it, it’s just a duty you have to do, it… it’s a… it’s a professional obligation. (Dr. X)

There are different possibilities as to why the concept of ownership for patients did not come out in the resident data. First, there were only four complete resident interviews, so with more interviews, this might have emerged. However, another possibility is that attending physicians, being more expert practitioners, might be demonstrating
their “intuitive grasp” (Benner, 1984, p 405) as to a core aspect of the developing role of doctor. They are full members of the community of practice, whereas the residents are still moving to full participation.

**Graduated responsibility.**

Graduated responsibility emerged as a theme from both sets of supervisors. Dr. R3_3 described her approach to facilitating this:

Whenever they need me, we have a team phone and they are allowed to call me with whatever issues, big or small, at any time… I don’t try and micro-manage my clerks just because I want them to be able to grow as well and make their own decisions so I… when we review patients or consults or anything, I always ask them what their approach would be and how they would like to pursue this and then kind of add my two cents to whatever they say. (Dr. R3_3)

Dr. W. gave an example of an approach she uses: “I had a few family meetings where I also got clerk to do [them]; to try to get them involved as much as possible and I would jump in when I had to but they were leading the discussion”. In these cases, supervisors are explicitly working in the zone of proximal development, allowing clerks to traverse the gap between supported practice and independent practice, with deliberate support (Vygotsky, 1978).

**Developing role of doctor – across the clerkship.**

Very few supervisors commented on the development of clerk skills over the course of clerkship. Dr. X was one physician who was explicit in discussing the differences between third year clerks (equivalent to Block 2 clerks) and fourth year clerks (equivalent to Block 2 clerks). He notes that third year clerks are usually:

where you would expect them to [be] coming out of second in clinical skills and, you know, basically knowing the format and the questions to answer and the items to look for in the physical examination and very little insight into what it all means in a clinical context from that point through to the time that they come out at the end of fourth year where they still have to have – at least in their mind – a cheat sheet of questions to ask and things to do in a particular area, but are able to at least recognize major usual clinical vignettes. (Dr. X)

This is quite consistent with Benner’s description of moving from a novice stage using “context-free rules” (1998, p. 403) to an advanced beginner stage and noting the “recurrent meaningful situational components” (p. 403).

Dr. R3_1 noted that she adapts her approach according to the experience of the clerk: “I kind of get a sense of who the clerks are in terms of where they are at their training and if they are brand-new, then I have a different
approach… approach to somebody who’s actually done medicine before”.

There are many possible explanations for the concept of skills developing over the course of the clerkship being a less prominent theme among supervisors. One possibility is that since supervisors were only interviewed once with respect to the clerks they were currently supervising, they may simply have been focusing on the questions posed to them about those clerks. However, it may also be relevant that the assessment system in clerkship does not differentiate explicitly between the expected performance of a novice clerk and an experienced clerk.

Overall, the developing role of doctor theme emerged strongly from the supervisor data, but with some differences in emphasis between residents and attending physicians, and again with some differences from how the clerks described this process. These differences between clerks and supervisors will be further explored in a later section, once the rest of the supervisor data analysis has been presented.

Role of the team.

The role of the team emerged as a significant theme from the supervisor data. This section will also address how the supervisors view their role in the team.

Role of supervisors – residents and attending physicians.

Both sets of supervisors have complex views of their roles in supervising clerks. Depending on the individual, they may identify themselves as any of the following: supervisors as teachers, learners, supervisors, guides, or mentors. Their descriptions of these roles are complex and interrelated. All supervisors view themselves as teachers. One experienced supervisor explains one of his approaches to teaching on a busy service:

When I come across issues in their understanding or something that doesn’t make sense to me, I try to drill into these problems or issues and get into some discussion. So really, it’s a combination of supervision and teaching – or learning – that happen at the same time. (Dr. Z)

By contrast, Dr. Y, as a relative newcomer to supervising clerks as an attending physician, explains her combined learner and teacher role: “It’s a learn as you go type of experience trying to listen to their approach without interrupting and giving them clear, concise feedback on every encounter”. Another attending describes his role primarily as a guide in contrast to that of a teacher:

I see my responsibility as basically trying to guide them in what they are supposed to be doing clinically and also guiding them in where to get information to increase their knowledge as well as when there are you
know, interesting cases with some academic value, bring them to learn from those patients even though they might not be their patients. (Dr. T)

Dr. U is succinct about the supervisory and teaching roles: “I think it’s two-fold. One is: Make sure that they are taking care of patients in a safe manner and are an appropriate manner and the second one is: To make sure that they have a good educational experience in the process”.

Residents take their teaching roles quite seriously: “Whenever I review a consult with them, I do teaching around the case. I teach them how to do a consult, how to write progress notes, how to do more problem-based thinking” (Dr. R3_1). Dr. R1 noted that he tried to make every moment with a clerk a teaching moment. Residents are learning how to supervise clerks: “It’s also a learning process for me to like you know, time-manage and to you know organize myself with the [critically ill patients] and also to spend more time with the clerks” (Dr. R3_2), although they describe that they don’t feel they have received much training in many of these roles:

I had done the RATs [residents as teachers] course – actually multiple times – over my years of residency. So that… that certainly helped me sort of you know, from the teaching side of supervision. Otherwise, sort of from a logistical side that I don’t… that I don’t remember. They may have given us something but it certainly wasn’t memorable enough for it to stick. (Dr. R5)

Both residents and attending physicians describe the challenges around managing these multiple roles:

[If a clerk has] like a sick, complicated patient then like you know, I bring them along for their management. It’s… it’s… even if it’s just like one clerk that I… that I’m able to give my attention to you know, I’m able to do like a lot of teaching around that case but then I feel like I’m neglecting my other [clerks]. (Dr. R3_2)

This attending physician expressed a common concern about not feeling able to properly fulfill the roles:

I think we are trying to do our best to teach them and supervise them but I think we are… in spite of our best efforts, I believe we are not doing a good job. Again, just because we don’t have the time to do it and I feel that frequently, we are giving them too much responsibility without proper supervision. (Dr. S)

These complex inter-related roles are consistent with the role of a more experienced member of a community of practice, who, while engaging in “full participation” (Lave & Wenger, 1991, p. 37) is responsible for helping to move newcomers along from the periphery. The newer attending physician, in fact, noted explicitly that she is very much still learning this aspect of full participation. Interestingly, except when prompted by a direct
question, most supervisors did not describe their role as that of an assessor, though it was implied frequently. The reason for this was not forthcoming from my data analysis. The issues noted above about competing pressures will be addressed further in a subsequent section about the theme of Working and Learning environments.

**Attending physicians’ view of the role of residents.**

The attending physicians have differing views of the role of the residents on the team. Dr. U describes their role as integral to the clerks’ learning experiences, and he seeks their input with respect to his assessment of clerk performance:

The residents, in essence, are able to provide more direct care because there’s more of them to really make sure that the clerks actually have someone to go to on a minute-by-minute basis, as they need to make sure things are taken care of. They also are the ones answering a lot of the frontline questions for the clerks and so they have insight in terms of how the clerks perform so I also get feedback from them in terms of clerk performance.

This attending physician sees the role of residents somewhat differently:

The only analogy that I can give you is that if you were going to study to be a carpenter, you wouldn’t… you may go to carpentry school but you wouldn’t just leave carpentry school and start building houses or making cabinets. You’d go work with a finished carpenter and watch how he does it. So if you’re going to do that, if the model that we’re going to use for a clerk – to become a doctor – is a first or second year resident, that’s not – in my humble opinion – that’s not very much aspiration for your career; if that’s the level that you plan to work at the end. (Dr. X)

Dr. X raises the question about whether novices should be learning from first and second year residents, whom he appears to conceptualize as advanced beginners, as opposed to practitioners further along the Novice to Expert continuum. By contrast, Dr. U describes the important role residents play in working in the zone of proximal development with clerks, where they are physically present on the wards and directly involved with immediate questions. As described previously, the clerks see and value both perspectives with respect to their learning.

**Residents’ views of the role of the attending physician.**

Residents are consistent in noting the crucial role of the attending on their ability to supervise clerks:

Having an attending staff who’s really available and helpful and who tries to help facilitate teaching allows for that time, allows for those situations to become present more often whereas having a staff who’s not
very involved means that you’re doing so much more on your own in supervising. You just have less time to be able to supervise clerks thoroughly. Like you just kind of do the superficial – make sure people are ok and move on. (Dr. R3_1)

Residents specifically discussed the role of the attending as support to them: “If the attending is supportive, then there’s more time to supervise clerks and do more things with them versus attendings who are not as supportive. It’s hard to manage a team and supervise clerks at the same time” (Dr. R3_3). These residents are demonstrating their skills as self-regulated learners by engaging in reflective practice, showing that they have thought about the role of the attending and how that affects their ability to supervise clerks. They recognize they require some assistance as they engage in becoming full participants in the community of practice.

**Role of the clerk on the team.**

Finally, a few supervisors, but not many, specifically discussed the role of the clerk on the team, mostly around **clerk engagement**. This resident described one scenario: “When the clerks are not interested and make themselves difficult to be found, [that] is a barrier to supervising them and giving them good feedback and teaching and whatnot” (Dr. R5). Dr. Z expands on this further:

Some of them are more proactive I would say and they seek the feedback. They would come with questions, concerns, really seeking to… I’m not sure they… they seek to get feedback but they really… sometimes they are just unsure and they lack confidence – which is good. So then sometimes they approach me and then this would lead to a better experience overall.

Dr. Z is recognizing how satisfying it is to work with self-regulated learners who are engaged in the learning process, in direct contrast to the disengaged clerks described by Dr. R5. It is not clear from the data, however, why this was not a more significant theme for supervisors. Most attending physician comments about clerk engagement were made in passing and were quite positive in nature, so it is possible they don’t perceive a lack of engagement to be a significant problem. Once again, the small number of resident interviews makes it difficult to interpret the lack of comments relating to a theme in that data set.

**Team factors.**

An interesting difference from the clerk data was a lack of discussion about team dynamics identified by the supervisors. This clearly had a significant impact on clerk learning as noted in the clerk data, but it did not emerge from the supervisor data at all. Again, the reason for this is not obvious from the data. However, it is possible that the
clerks as junior members of the team are much more aware of team dynamic issues which may or may not filter up to supervisors.

Overall, supervisors described the role of the team as being an important factor in their supervision of clerks, and many themes from the literature ran through the data including communities of practice, zone of proximal development, novice to expert, and self-regulated learning.

**Working and learning environment.**

Consistent with the clerks, the supervisor data revealed a significant impact of the working and learning environment on both attending physician and residents’ abilities to provide supervision to clerks.

**Clinical load.**

Not surprisingly, a team’s clinical load plays a significant role in the work and learning environment, and the data would indicate that might a bigger concern even for supervisors than for clerks. The concept of clinical load reflects not just the number of patients, but also the severity of the patients’ illnesses. This attending physician summarizes a common concern:

I think for me the cut-off is twenty-five patient and if it’s above twenty-five, I cannot do a lot of teaching and the… level of supervision, I know starts to goes down and maybe the teaching-to-service ratio starts to go down. (Dr. W)

Dr. R3_2 comments on the issue of complexity of patients: “We’ve had a lot of [critically ill] patients, so it’s been difficult to pull me away to really take a clerk and you know, go see their patient with them and see how their plan is”.

**Patient care is paramount.**

Related to patient load was the emergence of the importance of patient care is paramount, which did not emerge from the clerk data. Attending physicians commented that they absolutely had to ensure that patient care was their main priority, which was more than simply feeling a sense of ownership for patients, which could implied a shared priority with other responsibilities (such as studying, in the case of clerks). Comments from participants were coded as patient care is paramount when it was clear that patient care had to take precedence over all other responsibilities. As Dr. X states:
I have a huge sense of responsibility that I am the attending physician for the patient and the buck stops with me. So if something is wrong with the care of the patient then I’m responsible for what’s wrong with the care of the patient.

This is not surprising given that, by definition, the attending physician on CTU is recognized to be the most responsible physician in the view of the hospital, the medical profession, and from a medico legal perspective. This significant responsibility does not immediately seem to relate to the theories that underlie formative assessment, but on closer inspection, it is perhaps related to communities of practice. For example, a responsible attending physician, in order to allow newcomers (clerks) to have “legitimate peripheral participation” (Lave & Wenger, 1991, p. 29) must find tasks clerks can do that do not compromise patient care, and this can be very difficult in the case of complex, critically ill patients.

*Time factors.*

All supervisors cited *time factors* as being problematic, and, again, time pressures might be an even greater concern for supervisors than for clerks. Clinical load has a direct link to time factors, according to attending physicians. Dr. Y is quite clear about how significant the time issues are for her: “And the pace of the medical ward here is pretty chaotic – like I think all internal medicine is – but I think KGH is worse… for the chaos”. Dr. T expands on this:

We have so many patients here and not enough human resources that the time constraints are our main barrier to really teach properly because frequently you are running from, you know, one case to another and especially when we’re on take having so many patients that we have to review in a very limited period of time that Unfortunately you feel like you are not doing a right… the right job frequently because of time constraints.

Another attending physician recognized the small size of Queen’s University compared to other medical schools as playing a role in individuals having multiple responsibilities, and, thus, reduced time:

You know, it’s a pretty small institution for the numbers of learners that come through here. So once you get flagged or pegged as somebody who teaches, you just get asked to do more and more and more and that’s my biggest fear for Queen’s and their things is that there’s not a lot of people to spread that work around.

(Dr. V)
When asked about barriers to his ability to provide supervision for clerks, Dr. U noted he was “spread too thin with other academic responsibilities”, specifically, “serving on four committees, serving as a course director, teaching clinical skills and having [a family] at home”.

Residents feel similar pressures: “The biggest restrictions to assessing the clerks properly is your workload and the amount of time that you have” (Dr. R3_2). Another resident explains further:

Anytime things get busy the residents will just take on more of the difficult patients, …. then have less time to teach or to really get an idea of what those clerks’ plans are. [You] just start to manage people on their own – especially if you have really sick patients – just start to manage things on your own and then try and teach a bit after the fact – which isn’t always the best. (Dr. R3_2)

Another element relating to time factors is around scheduling of competing activities: “Essentially what we need is that we need to have time which is people are not running around and doing things so we have like dedicated hour or two hour you could sit down either review the cases” (Dr. S). All attending physicians and residents cited time factors as significant barriers to their ability to supervise clerks, and usually, this was the first barrier listed. It is clearly a significant concern for all supervisors.

**Administrative barriers.**

These time factors are often directly related to administrative barriers, and supervisors have similar experiences to clerks with these. One attending physician spoke at length about barriers created by the size of the teams:

I think our teams are too big. By that I mean “too big” in terms of patients and numbers of learners on teams. So a typical team on CTU here is: Two seniors, three [first-year residents] and three clerks. So just you know, we have them that big ‘cause when they’re post-call, half are missing but if everybody’s there and nobody’s on holiday, it’s too big to do well. (Dr. V)

Another attending addressed more administrative barriers relating to where the patients are located in the hospital: “I have patients on seven or eight and maybe sometime more than that different places, different locations in the hospital and it’s really hard to so it’s… I would say it’s impossible to have team rounds so every patients gets to have some attention” (Dr. Z). These barriers speak to some of the challenges that can occur when learning is happening within a community of practice; the full participants, with multiple significant responsibilities, may find it difficult to actively supervise those at the periphery.
Overall, supervisors appear to concur with clerks that there are significant working and learning environment issues that seem to play a mostly negative role on clerk learning. Supervisors appear to view this as even more of an issue than clerks, perhaps since they are more engaged with other responsibilities associated with their current roles.

**Educational strategies.**

As with the clerk data, the following categories were part of the theme of educational strategies: teaching, feedback, and assessment practices. However, the content of these categories differed from that of the clerk categories.

**Teaching.**

In terms of teaching, I have already analyzed the data of supervisors identifying themselves as teachers, which includes some discussion of their teaching strategies in the section on the role of the team. In addition to those teaching references, however, attending physicians and residents spoke further of how Queen’s University might support their teaching role better. Some attending physicians were seeking supports in terms of faculty development. One of the newer attending physicians spoke to this particularly, referring to an expression used in medicine about how trainees used to learn to perform procedures: “see one, do one, teach one”:

When you start here, you may not have any education background other than the fact that you were in medical education so… I mean – you were educated but you didn’t actually get trained. So I feel a daily struggle to try and develop and improve an approach to dealing with clerks. I think that I would like more training in how best to teach and deliver material and evaluate. Again, I was in the “See One -Do One - Teach One” era, so it’s like: “Go ahead and do it” and I would like a bit more formal approach there. (Dr. Y)

This was echoed by a much more experienced attending physician:

It is strongly recommended that you should probably have some sort of orientation about what do we need by evaluation, assessment. What are the aspects we are looking for? What are the subtle things which we maybe don’t and try to follow them and how do we rely on other people to do it for us? (Dr. S)

Residents, too, commented on a lack of preparation for supervising clerks:

I’m just kind of doing what… I did my medical training and whatever was done with me and what I saw… When I thought that there was a resident who was exceptionally good, I would try and emulate them or if I
saw an attending who was exceptionally good, I tried to emulate them. I’ve never had any official training. (Dr. R3_3)

These comments raise questions about how other communities of practice prepare the full participants to assist the newcomers (Lave & Wenger, 1991). Most physicians should have good self-regulated learning skills, and these supervisors, both residents and attending physicians, are self-assessing as having learning needs that are not being met by their institution.

**Feedback.**

In terms of feedback, as noted in previous sections, residents and attending physicians noted they try to provide feedback to clerks when possible. For example, one resident describes how she ensures clerks receive feedback:

By allowing the clerks to present in front of everybody. Their patients, what the issues are, what they’re planning on doing and then like their… the attendings or/and the senior residents are able to give them feedback about you know, what they’ve been doing right with their assessment and you know what ways that they can improve on. (Dr. R3_2)

One attending physician described a model in another university whereby clerks had a faculty mentor whose role would be primarily to provide clerks with feedback:

You know where I worked before, they had enough faculty that, you know, clerks on any CTU team would have a separate faculty mentor who would sit down and go through their case presentations on an individual, one-by-one basis. So they were able to get the hour feedback on each individual presentation as opposed to the ten minutes post-call: “Ok, tell me what you want.” And they’d have to write them up well and they get them graded and all of those kinds of things. That was fantastic. They loved it, of course. We can’t do that here. (Dr. V)

It’s clear that supervisors value feedback, even though they may struggle to provide it due to the previously described time and workload constraints. Dr. V describes a model that supports self-regulated learning, perhaps more than is possible at Queen’s University in the current setting.
Assessment practices.

Near the end of the interview, supervisors were asked how they assess clerk performance, which was usually the first time the term assessment was used during the interview. Dr. R3_1 describes her initial approach, which is consistent with that described by other residents and by most attending physicians:

It starts with how they are able to relay data that they’re gathering and so I assess them by listening to their… reports on what they’ve done with their patients. Listening to their history, listening to their physical exams and then sometimes guiding them through – if there [are] key things that were missed, I’ll ask about them. (Dr. R3_1)

If there are concerns arising from this initial approach, she then describes her next step: “[If] they’re struggling a little bit, I’ll assign either myself of my other senior resident to go with that clerk and see each of their patients one day and try to find the major issues” (Dr. R3_1). In effect, she describes an approach of having the clerks present to her, and then, if there are concerns, she ensures direct observation of the clerk with their patients to learn more about the clerk’s deficiencies.

Dr. R3_3 explains that she seeks input from other team members at times:

I try and talk to the… other juniors on the team and get a sense of what they think but because I myself as a senior get to work very closely with the clerks, I don’t normally have to rely on it. I find that the attendings rely on my feedback when they’re doing their evaluation more so than I’m relying on other people’s. (Dr. R3_3)

Of note, Dr. R1 reported that he had never been asked for his input on the clerks as a junior resident. He reported asking questions to understand the clerk’s thinking as being a key part of his approach to assessing the clerk, so that he could give them feedback, which, as noted previously, was highly valued by the clerks who worked with him.

In addition to their assessment of the clerks’ presentations, and feedback from the residents, most attending physicians endeavor to directly observe the clerks, which is helped by the clerks asking them to do this:

The students I find here are pretty good about, you know, getting us to do the Mini-PEX things with them so I try and make sure that I do those directly observed things. I always ask the residents how they think the clerks are doing and you know, most of the time that seems to jive with my impression of their performance. But I will tell them, you know when talked to them – I’ve spoken to the residents and you know, this is how they feel about stuff too. (Dr. V.)
However, most attending physicians commented on how they may have to rely more on the clerks’ presentations as a basis for assessment: “It’s a lot and maybe mostly – or quite likely mostly – what I hear from them - so their oral presentations” (Dr. Z). The concern with this approach is that they may have strong oral presentation skills, but have deficiencies in their history taking or physical examination skills, which might not be detected. These skills are complex and are likely not ones that can be addressed by self-assessment skills alone.

In describing their assessment of clerks, supervisors are not very precise about what they feel they are assessing, or what standards or criteria they use to assess the clerks. What emerged from the data is the concept of comparing to peers, but mainly in that they consider peers to be at an acceptable standard, however ill defined that standard might be. They do not appear to be norm referencing; but they do not appear to have defined criteria against which they are assessing the clerks. Dr. X explains:

And so I’d say that, yeah, the vast majority of them are kind of on the curve but you… one of the challenges is to recognize – particularly when somebody is behind the curve – is not adequately up on the curve because they require more work and you’ve got to figure out why is it.

Overall, the supervisors try to assess the clerks by direct observation of certain skills, by assessing the clerks’ oral presentation skills, and by getting feedback from other team members, including, only occasionally, input from junior residents. While not explicit about criteria, they do appear to be trying to compare the clerks against a standard. At no point did any supervisor refer to any formal Queen’s University criteria about expectations around clerk performance.

In summary, the same themes emerged from the supervisor data as did from the clerk data, but there is often a different emphasis within the categories in any one theme, and these will be explored further in the next section.

Comparison of Clerk and Supervisor Results

The data analysis of the clerk and supervisor data revealed the same four major themes playing a significant role in the learning and assessment experiences of clerks: the Developing Role of Doctor, Team Factors, Work and Learning Environments, and Educational Strategies. Within each of these themes, different participants have somewhat differing experiences. The clerks describe a much richer understanding of their developing role of doctor over the course of clerkship; this could be due in part to it being their experience (versus an experience being observed by a supervisor), but it might also be related to two extra forms of data collection for clerks, namely the questionnaires and the focus groups. However, even if supervisors don’t describe the role changing as much as the
clerks, some supervisors did allude to it, and it may well be something the more expert physicians have simply internalized.

Both groups note the role of the team in playing a significant role in clerk learning but clerks are much more descriptive about the effects of team structure and dynamics. Again, this is from the clerk’s eyes, and, as junior members of the team, they may well be much more aware of how the dynamics affect their learning. The supervisors, with their increased focus on patient care, may be less aware of how team members are affecting the learning of the most junior members. As fully participatory members of the community of practice, it’s possible they are somewhat removed from those at the level of legitimate peripheral participation (Lave & Wenger, 1991).

A very interesting finding is the increased importance of the role of the junior resident by clerks. This is significant in light of the fact that there was little commentary about junior residents by more senior supervisors. The lone junior resident who participated in the study was highly cited by the clerks as being a great teacher, but at no point was his input sought about the performance of clerks on his team. His experience cannot necessarily be generalized, but it is noteworthy that very few supervisors mentioned seeking input from junior residents about the clerks. The zone of proximal development (Vygotsky, 1978) might well be playing a role in this phenomenon. From the clerks’ perspective, the junior residents are close to them in training, and can provide focused support to them to move one step forward on some skills; but the more expert physicians may not be as clearly aware of the gap, and thus aren’t addressing it.

Clerks and supervisors are united in their concerns about the working and learning environment they experience. The clinical load and other workload issues are high, and all are aware of this and the impact it has on learning. While supervisors have an increased concern about keeping patient care as paramount, all participants in the study recognized that teams with high clinical loads were particularly stressed, and this affected teaching and learning for all team members.

Finally, with respect to educational strategies, clerks and supervisors had similar views of the importance of teaching, feedback, and assessment, but are generally on opposite sides of the coin in that clerks are more often the recipients of these, whereas supervisors are usually the providers. Residents are in a unique situation, not really highlighted by the data, where they are very clearly both providing these as supervisors, and receiving them as learners. Despite coming at the issues from different perspectives, the clerks and supervisors identified very similar categories within themes. One major difference is the identification by attending physicians primarily for the need
for increased faculty development and support in their teaching roles. One supervisor went further, indicating the need for the university to more explicitly value the role of supervisors in clerkship settings:

The clinical teaching pieces and the amount of time that that takes to do well has sort of zero formal recognition. I think that’s a major mistake. So if you teach clinical skills [to pre-clerkship students], you get a nice big chunk of your time protected. I think that I probably teach clinical skills more than most faculty here and if I didn’t sign up for one year, I get zero credit for that at the moment. And you could argue that once they’re on the wards, that’s really the… well, it’s not more important but it’s as important as their sort of modeled clinical skills teaching early on. (Dr. V)

What is valued at the university level is essentially invisible to most clerks, at least according to what emerged from the data. This, in fact, adds an extra layer in the working and learning environment discussion, at least at the level of the attending physicians.

**Relationships Between Themes**

In reviewing the data from both groups, the relationships between themes emerged, and this is represented in Figure 2, below. The developing role of doctor is central to what clerks are striving to achieve, and what supervisors are supporting them to do. The other themes, (working and learning environment, the role of the team, and educational strategies) all feed into the developing role of doctor. The data did not support the developing role of doctor affecting the other themes, so the arrows only point from the other themes into the developing role of doctor.

The other themes, though, do affect one another. For example, clerks with a weak team relied more on formal educational strategies and were more susceptible to the effects of a negative working and learning environment. Another example was the frequently reported notion that a very busy clinical service, which would fall under working and learning environment, could make it difficult for clerks to get to scheduled teaching sessions. Thus, the arrows between the three themes of working and learning environment, the role of the team, and educational strategies are bidirectional, to represent how the can affect one another.
However, when I reviewed this model, I realized it did not fully capture the interrelations between the four themes. Figure 3, below, captures what is missing from Figure 2: the factors that affect, positively or negatively, the overlap between pure “work” and pure “learning”. In Figure 3, I am trying to capture the concept that the goal is for maximal overlap between the two circles, where work and learning become one. Pure overlap is likely impossible in a true workplace-based setting, but positive factors will encourage the overlap between work and learning, including the provision of teaching and feedback, the existence of a positive team environment with a reasonable clinical load, graduated responsibility for the clerks, and, importantly, an engaged and effective course director. This came out in many interviews, from clerks and attending physicians. When a Block 8 clerk made this statement in the focus group, all the other participants readily agreed:

I think if Dr. Bond gets the right feedback - ‘cause I really think he’s committed enough and passionate enough to change it – I think if he gets the right feedback, he can really make this something so valuable because when we came into med school, this is what we were picturing. We were picturing the medicine that happens on team medicine. (F8_Q4, B8)
An attending physician concurs: “Dr. Bond, for example, has done a phenomenal job with the Medicine Core Clerkship” (Dr. V).

Factors that reduce the overlap of the circles:
- Administrative barriers/CTU structure
- Negative team environment
- High clinical load
- Lack of teaching and feedback

Factors that increase overlap of the circles:
- Teaching and feedback
- Positive team environment/Reasonable clinical load
- Engaged, effective course director
- Graduated responsibility

Figure 3: Factors that affect the overlap between work and learning on the Clinical Teaching Units (CTU)

Factors that appear to force the circles to separate are often the opposites of what brings the circles together, but also include the current CTU structure (size of team, number of patients, geographical distribution in the hospital) and significant administrative barriers as described previously. The data from clerks and supervisors supports these two models. While clerks and supervisors are usually viewing the issues with different lenses, they seem to generally concur on what the challenges to clerk experiences with learning and assessment are, and what opportunities there are to address these concerns.

Artifact Analysis

This section includes my analysis of all policies, procedures, and forms that relate to assessment practices in the Core Internal Medicine Clerkship course. The seven artifacts listed in Table 2 (in Chapter 3, p. 43) were analyzed
as described in Chapter 3, page 46 to 47 to understand how formative assessment is intended to occur in the course. Each artifact was reviewed to analyze how its contents contributed to the provision of formative assessment.

**Undergraduate medical education student evaluation, progress & promotions policy.**

The current overarching Queen’s University undergraduate medical education policy relating to student assessment is dated June 17, 2011, and posted on-line (Queen’s University School of Medicine, 2011b). Four sections relate to formative assessment or feedback. In section 1.2, it is noted that one of the purposes of student evaluation is “provision of feedback to students and faculty with respect to ongoing learning needs” (p. 1). Section 2.2 defines “formative evaluation” as intending “to provide feedback that will enable students to assess their level of achievement and ongoing learning needs” (p.1). This section also refers readers to the spring 2008 edition of “The Teaching Doctor”, a newsletter by the Office of Health Sciences Education that, on page 1, references Schute’s definition of formative assessment “information communicated to the learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning” (Schute, 2008, p. 154). Section 5.8 of the policy references accreditation standards as it outlines that:

> each course will offer formative evaluation designed to provide feedback to students that will enable them to assess their level of achievement and ongoing learning needs [ED-30]. This should occur once in each course, and approximately the midway point, or in sufficient time to allow for any required remediation [ED30] [ED31]. (Queen’s University School of Medicine, 2011b, pp. 2-3)

Finally, section 6.5 notes that “students should receive timely feedback regarding their performance on both formative and qualifying examinations, generally within 7 to 14 days respectively” (p. 3).

Overall, this policy provides the broad strokes to support the inclusion of formative assessment in all courses, including clerkship courses. However, since the definitions of formative assessment, evaluation, and feedback vary or are unclear throughout the document, it is not always explicit what would constitute appropriate formative assessment and feedback in a clerkship setting.

**Student assessment during clerkship policy.**

The student assessment during clerkship policy (Queen’s University School of Medicine, 2011a) was approved in October 2011. Two sections address the principles of formative assessment and feedback. Section 6 specifically addresses mid-rotation assessment as follows:
All students will receive a formal mid-rotation assessment, which will be documented on the appropriate form, no later than the beginning of the fourth week of the course. Any marginal notations will mandate a meeting with the Course director or faculty delegate. (p. 2)

The form that is mentioned is the Clerkship Mid-Rotation Evaluation form (Appendix B), to be analyzed later in this section. Although not explicitly addressing formative assessment, section 4 notes that Clinical Performance Evaluation forms may be compiled from a portfolio of daily or weekly assessments at the discretion of the Course Director. All assessment forms used should include a narrative assessment component. (Queen’s University School of Medicine, 2011a, p. 2)

It is possible that some of these forms might capture episodes of formative assessment and feedback, depending on the form and the associated activity.

This clerkship assessment policy is more precise than the general policy about what formative assessment and feedback must comprise, although in this case, there is no use of the term “formative assessment”.

Core Internal Medicine course page.

The Core Internal Medicine course page is on-line, and outlines the overall assessment strategy for the course (Queen’s University School of Medicine Core Internal Medicine, 2012). Formative assessment is not explicitly mentioned however, there is a clear notation of the requirement of the Mid-Rotation Evaluation form (Appendix B) noting “satisfactory clinical performance”, to be “submitted at the halfway mark of the rotation” (Queen’s University School of Medicine Core Internal Medicine, 2012). Otherwise, the course page, as previously described in Chapter 1 on pages 10 and 11, lays out the requirements for passing the course. Overall, the course page is clear about what is required to pass the course, but, once again, the term “formative assessment” is not explicitly noted.

Clerkship mid-rotation evaluation form.

This is the clerkship-wide final assessment form (Appendix C) referenced in the clerkship assessment policy (Queen’s University School of Medicine, 2011a). On page 1, ten generic clerkship objectives are listed, (e.g., “selects and interprets diagnostic tests appropriately and accurately”). Supervisors must check off one of the following descriptors: “will require significant improvement to meet objective”, “will require some improvement to meet objective”, or “progressing well to meet objective”. On page 2, the supervisor is asked to fill in two text boxes, one for “continue”, and one for “stop or do more”. In addition, the form links to a password-protected on-line
community including further explanations about the Bayer Feedback Grid. Finally, there is a prompt for the supervisor to include “suggested actions to enhance student learning/performance”. Once again, this form does not include the term “formative assessment”. However, it is structured to encourage the supervisor to actively provide specific information about the clerk’s current level of performance, and to give specific feedback about how to improve, which would meet most definitions of formative assessment and feedback. This form would appear to support self-regulated learning, in that (in theory), it “delivers high quality information to students about their learning”, and “encourages teacher …. dialogue about learning”, and “provides opportunities to close the gap between current and desired performance” (Nicol & Macfarlane-Dick, 2006, p. 199).

**Mini-PEX (Mini-physical examination form).**

This is Appendix A. As per a former course director (Dr. Previous Course Director, personal communication, 2005), the form has been in use since 2005 or 2006. There are five “evaluation parameters” listed (e.g., “humanistic qualities” and “competency in performing the task properly”), and the supervisor, after watching the clerk, selects “needs improvement” or “satisfactory” for each parameter. There is a small section for comments with no sentence stems for prompting. The form is to be completed after the supervisor directly observes the clerk carrying out a portion of a physical exam on a patient, and is supposed to provide an opportunity for discussion and feedback.

In reviewing the form, it is not clear whether it is being used as summative assessment, formative assessment, or both. Its intent in the course appears to be both: summative, in that it supposed to ensure that clerks are at an appropriate level of competence with their physical exam skills; and formative, in that is supposed to help promote an opportunity for feedback to improve performance. As noted, there are no prompts to the supervisor about what types of comments would be helpful. Its utility as a formative assessment tool appears to be somewhat limited, due to the above noted issues.

**Core medicine mid-block assessment form.**

This form, included in Appendix D, is the form designed by Dr. Bond to enhance feedback at the mid-point of the rotation. Page 1 of the form includes a brief summary of the “reporter-interpreter-manager-educator” (RIME) framework as adapted from (DeWitt, Carline, Paauw & Pangaro, 2008). Under each category, descriptors are provided to explain the level of clerk performance. For example, under “reporter”, it is noted that: “an example would be a clerk able to gather all of the information, and present it in a appropriately structured manner, but with a
lack of interpretation or application of the information” (p. 1), whereas the example provided for “interpreter” is as follows: “consistently demonstrating a well-structured presentation, with appropriate diagnostic interpretation, but lacking a comprehensive plan to address the active issues” (p. 1). The clerk performing at the interpreter level is performing at a more advanced level than the clerk at the reporter level. (On page 2 of the form, further elaboration about RIME is provided as a reference for those who are assessing the clerk’s performance.)

The form also includes a line, included below as Figure 4, where the course director, having collected feedback from the clerk’s attending physicians and senior residents, provides a global rating of their performance. Finally, the course director also uses the prompts of “continue”, “start/do more”, “consider”, and “stop/do less” to provide structure to the feedback he provides to the clerks.

Please mark an X to rate the clerk on a continuum

<table>
<thead>
<tr>
<th>Reporter</th>
<th>Interpreter</th>
<th>Manager</th>
<th>Educator</th>
</tr>
</thead>
</table>

*Figure 4: RIME continuum from the Core Medicine Mid-block Assessment Form*

This form was designed for purely formative assessment and feedback purposes, and its design supports this intent. The clerks are provided with a summary of the impressions of their supervisors about where they are operating on the RIME continuum, and they should receive clear information about what they are doing well and what they can improve upon, including suggestions to help the achieve these changes. Despite this, the form does not include the term “formative assessment”.

**Core medicine clerkship final assessment form.**

This form is included in Appendix C. The first two pages consist of a table with domains to be assessed by the supervisor (e.g., “foundational knowledge” or “interpret tests”) (pp.1-2). Each domain includes a descriptor of expected performance; for example, “team functioning” is explained as “works with others effectively” (p.2). For most domains, supervisors must select one of “meets expectations”, “inconsistently meets expectations”, or “does not meet expectations”. However, for the following three domains, they are simply to choose yes or no: “actively participates in learning opportunities”, “accepts supervision and feedback”, and “balances personal, educational and clinical priorities”, and no descriptors are provided for these domains. On page 3, the form includes a grid with four boxes with the following headings: “continue”, “start, or do more”, “consider”, and “stop, or do less”, and associated suggestions about what supervisors should include (e.g., for “consider”, it suggests “highlight a point of growth for the learner, a ‘doable’ challenge for future interactions’). Finally, there is a section for other comments from the
“evaluator”, comments from the clerk, and signatures (p.3). In this version of the form, there is a course director section where the course director notes if the clerks have logged the required encounters at this point, and there is a section for the director to note the plan for remediation.

This form is by definition a form for summative assessment. Interestingly, it includes many opportunities in the grid on page 3 for supervisors to provide feedback to clerks to consider on future rotations. In this, it includes an element of formative feedback for the clerk to use on future rotations. Of note, again, no mention is made of formative assessment or feedback on the form, but this is not surprising given the intended use of the form. It is notable, though, that a summative form actually includes prompts for formative feedback, whereas some of the forms that have been cited as being formative in intended use have far less to prompt the user.

Artifact analysis summary.

The documents that reflect the policies, processes and procedures that govern formative assessment in the Core Internal Medicine Clerkship course generally support the concepts of formative assessment and feedback. However, given that the terminology varies between and even within documents, and that the terms formative assessment and feedback are only used infrequently, there is the potential for confusion around these processes and procedures.

In comparing the participant data to the artifact analysis, there are some further areas of concordance. As noted previously, the term “formative assessment” was used only rarely in any of the participant data, and this might not be surprising given the varying definitions that exist in the different documents, and the lack of identifying certain documents as representative of formative assessment. As well, as the clerks noted, the forms may not supply them with much useful feedback information if a comment sections is either not present, not completed, or not providing any helpful sentence stems as prompts. Overall, the data analysis reveals clerks, supervisors, and a School of Medicine who are committed to the principles of formative assessment, and who value its components, but who might not in fact have strong concepts of what formative assessment is.

Chapter Summary

In this chapter, I presented insights from the study regarding what factors affect clerk learning in the Core Internal Medicine course, by reporting on the clerk, supervisor, and artifact analysis data. Four key themes that affect clerk learning emerged including the Developing Role of Doctor, Team Factors, Working and Learning Environments, and Educational Strategies, and I discussed possible ways these themes relate to one another. In
Chapter 6, I will revisit my second, third, and fourth research questions to describe the multiple perspectives of formative assessment provided by the participant groups.
Chapter 6: Discussion of Results

In this chapter, referring to my data analysis, I will revisit and answer my second, third, and fourth research questions.

Question 2: How do clinical supervisors and clerks in the internal medicine clerkship course describe the role of assessment in learning?

Neither clerks nor supervisors spontaneously described any role for assessment practices in clerk learning in the initial interviews (the main source of data for this question) or, in the clerks’ cases, in the questionnaires or focus groups. Most concepts of the role of assessment in learning came out obliquely in the data, or when participants responded directly to a specific question about assessment.

Clerks tended to conceive assessment as something that is formal and associated with a form or exam, and usually administered by someone else. Rarely did they refer to self-assessment, or their potential role in seeking assessment and feedback. This may reflect their novice state with respect to the complex skills required in clerkship and medicine in general, which might make it difficult for them to utilize self-regulated learning skills. For example, if they are unclear about their performance, they may find it difficult to set their own learning goals. If, then, they are not proactive about seeking out the input or feedback they require, they are then resuming a passive role in their learning. Similarly, clerks did not usually describe peer assessment (or near-peer assessment in the case of junior residents) as being critical to their learning, although this could be another source of assessment for learning that might be accessible to them. Interestingly, they did often report they found peer teaching helpful.

With respect to assessment practices, clerks had mixed experiences around how useful forms were and linked their utility to the quality of feedback they received. Clerks were very clear that feedback, if it was of good quality, was very helpful to their learning. They crave more, and want it to be constructive. They rarely identified their major summative assessment, the NBME exam, as having any role in their learning. A Block 2 clerk provided a typical answer to the question: “What role do assessment practices play in your learning?”

The primary role that these [assessment practices] play for me is to motivate me to learn the material that’s going to be tested and hopefully more – and often the case is a lot more – but the very least it’s to just ensure that I’m reviewing that information that I may or may not otherwise go in to such great detail in learning it. The second role they play is to give me some feedback on how I’m doing and how I might compare to my peers or, you know, just am I satisfactory as a student so far. Not … all of the assessments
satisfy the second aspects of that but certainly the evaluations that need to be done are really valuable from that sense, whereas the other tests, etcetera, are more geared towards just ensuring that I force myself to review the stuff that I need to. (H8, I1)

Supervisors usually described assessment as something they do at the end of a rotation, in a summative fashion, based on several days or weeks of observation of the clerk, usually with input received from residents. This is less consistent with assessment for learning, and more consistent with assessment of learning. Dr. Y provided a typical reply, when asked how she assessed clerks:

Direct observation in patient care. Watching them interact. Watching them do physical examination. A large part of it is just listening to their assessment plans and what they perceive as the you know, issues and plan. And talking to residents who are working with them to see what they feel they’re, you know - how they’re doing. That helps me as well. (Dr. Y)

However, when discussing how they supervise clerks, residents and attending physicians often alluded to assessing clerks’ skills early on in the rotation, and most times when they interacted with clerks, such as when they are presenting on rounds, or just after they saw a new patient in the emergency department. At times, they discussed this initial assessment of clerks in the context of ensure the clerks would be safe to take on usual clerk roles in the care of patients, and to determine how much supervision they would require:

My approach to supervising clerks …. but usually it involved sort of quickly assessing the clerk to find out how well they could be trusted on their own and then using that information to further tailor how much supervision they would need. (Dr. R5)

Of note, neither residents nor attending physicians described actively involving the students in the assessment process, by, for example, asking them for self-assessment of performance, or if they had any specific learning goals. As supervisors, they did not describing using any learner input to adapt their teaching or to adapt the learning experiences of the clerks to meet stated clerk needs.

However, while clerks and supervisors did not often explicitly describe assessment for learning, it is implied frequently in the data, especially, from the clerks’ perspectives, when feedback is provided to them. Clerks are interested in feedback that helps them to improve their performance, but they also want to know whether they are performing at an appropriate level for their stage of training. Of note, the supervisors do not generally refer to
assessing the clerks against any type of formal standard or criterion, but they all seem to have some internal concept of how a clerk should be performing.

**Question 3: To what extent is formative assessment integrated into the internal medicine clerkship course?**

The term “formative assessment” was not used in any questionnaire data, which was to be the main source of data to inform the answer to this question from a clerk perspective. However, many of the positive learning experiences reported in the questionnaires were instances of clerks participating in a learning activity, after which they received feedback on their performance. For example:

One of the major factors that contributed to my preparedness in having these difficult conversations was the support from my CTU team prior to my conversations with the patients. The team outlined their own strategies for communicating effectively, were very supportive, and provided feedback mechanisms for me after the fact. (Q8_1)

If we accept that there is an implied assessment of their performance by a supervisor that happens before they receive feedback (though it is unknown against which criteria they are being measured), this would fulfill the definition I proposed for formative assessment in a clerkship setting: Formative assessment is any assessment practice where clerks receive feedback on their performance, which will enable them to measure their progress in learning and to remediate any areas of concern.

Although not explicitly labeled as formative assessment, clerks did generally report that the mid-rotation assessment meetings with Dr. Bond provided them with an idea of their progress to date in the rotation, and usually gave them constructive feedback they could use to improve their performance. Again, this would meet the proposed definition for formative assessment.

I like how Dr. Bond gave us formal feedback even if we didn’t get it from our own team. Like our team talked to Dr. Bond and then he gave us formal feedback and even though he didn’t work directly with us like you know he gave some indication like: “I’m worried about you or I’m not worried about you.” (F2_3, H2)

Analysis from the review of relevant policies, procedures and forms demonstrated a theme of support for the principles of formative assessment, particularly in the newly revised assessment forms. With the exception of the Mini-PEX, all forms contain prompts to encourage supervisors to provide constructive feedback. However, none of the forms contained any place for clerks to indicate their own learning goals, or any form of self-assessment, which
could be included to support self-regulated learning. It was beyond the scope of this study to review the content of the forms, so the question about how formative assessment is actually enacted in the clerkship cannot fully be answered, except by clerk report.

The artifact analysis also revealed a significant lack of consistency as to how the School of Medicine is defining formative assessment and feedback, which may have more relevance to Question 2, about how clerks and supervisors conceive the role of assessment in learning. Overall, it appears from the data that there is formative assessment happening in the Core Internal Medicine course; but how well it is identified and integrated, and how well it incorporates the theories that underlie assessment and learning is somewhat unclear.

**Question 4: To what extent do clerks completing this clerkship course recognize and value current strategies of formative assessment?**

This question can be addressed in part by a question asked by a clerk in the middle of the Block 2 focus group. These clerks were already 4.5 months into their clerkship, just over one year away from graduating from medical school. After I asked them my question about the opportunities for formative assessment in the course, there was a loud silence, interrupted by a brave clerk, who whispered: “Dr. Gibson? What’s formative?” (F2_4, H2).

This question, which was not immediately answered by any other focus group participant, highlights one of the findings from the data analysis. Clerks do not use the term “formative assessment”, nor do they appear to have a good understanding of what the term means. When asked in the initial interviews about how assessment affected their learning, not one clerk used the term “formative assessment”. At no point during the questionnaires was the term “formative assessment” used by either group of clerks. In the focus groups, until I introduced the fourth question, which explicitly asked about formative assessment opportunities in the Core Internal Medicine Clerkship Course, the term “formative assessment” was not used. This is particularly striking if one considers that all the consent forms and information letters used the term “formative assessment” explicitly.

In stark contrast to their apparent lack of understanding of the term “formative assessment”, clerks are able to describe clearly the elements of formative assessment as described in the literature, and how these help with their learning. In fact, the clerk who admitted he didn’t understand the term “formative” then went on to answer the question about whether there were opportunities for formative assessment in internal medicine as follows:

Yes. I think the best one for me is the on-call case review with the attending or even your senior resident ‘cause that really highlights your deficiencies and also reinforces your competencies and that is
In this simple statement, he has highlighted that in reviewing a case with his attending physician, he received feedback on his performance that helped him to measure his progress in his learning and that identified deficiencies that he needed to address. Another clerk in the same focus group took the discussion further, highlighting the frequency of opportunities for formative assessment and feedback:

Every opportunity in internal medicine, there’s an opportunity for formative assessment like every time you turn around. And the key often like, obviously, we have to take some ownership of that but it really makes a difference who’s on the other end. So who’s actually turning around and posing the questions back to you and you’ll sometimes get that more with certain people than with others …. like with the times where you’re able to like: “Well, what did you hear? Now tell me what that means.” You know “Do this…” and that, that for me is formative assessment and it is fantastic when it happens. (F2_4, D2)

This clerk highlights a few key principles of how self-regulated learners operate and how they should be supported. With respect to self-regulated learning, Zimmerman noted: “The core issue is whether a learner displays personal initiative, perseverance, and adaptive skill” (2008, p. 167), and this clerk is describing initiative. What he is seeking, though, is feedback that meets Nicol and Macfarlane-Dick’s seven principles for good feedback in the context of self-regulated learning (2006). He is not always getting feedback that will “help clarify what good performance is (goals, criteria, expected standards)”, that “delivers high quality information to students about their learning”, that “encourages positive motivational beliefs and self-esteem”, or that “provides opportunities to close the gap between current and desired performance” (p. 205).

In summary, clerks clearly value formative assessment opportunities in the course, even if they don’t label them as such. This is not terribly surprising in that they were unclear about the definition of formative assessment. Based on the experiences of the clerks and supervisors, and on my analysis of pertinent artifacts, a number of recommendations for improving formative assessment are provided in the following chapter, and suggestions for future research are proposed.

Chapter Summary

In this chapter, I drew from the data to answer Questions 2, 3, and 4 about the participants’ concepts about formative assessment, and about how policies, procedures, and forms support formative assessment in the Core
Internal Medicine course. Based on the experiences of the clerks and supervisors, and on my analysis of pertinent artifacts, a number of recommendations for improving formative assessment are provided in Chapter 7, and suggestions for future research are proposed.
Chapter 7: Recommendations and Conclusions

The experiences of the clerks and supervisors participating in this study have implications for the integration of formative assessment in the Core Internal Medicine Clerkship course, and for areas for further research. This chapter will discuss both.

Recommendations

These will be presented in the context of the major themes that emerged from the data, but will be organized according to what steps might be considered to improve the current systems.

Institutional definitions of formative assessment.

From the artifact analysis, it appears that there is a lack of consensus around accepted definitions for formative assessment, which permeates the policies, procedures, and forms of the School of Medicine. The Student Assessment Committee is finalizing a major revision of their policy, which represents an essential first step to have a consistent institutional view of assessment in general, and of formative assessment in particular. However, this may be insufficient on its own, if the theories that underlie the principles of formative assessment are not taken into account, and more widely disseminated. For example, if the School of Medicine values self-regulated learning, then the principles of self-regulated learning should also be consistently incorporated into policies, procedures and documents that pertain to assessment and learning, such as facilitating self-assessment and teacher/learner dialogue about learning.

Incorporation of formative assessment and related concepts in the curriculum.

In order for clerks to benefit from formative assessment, they should be exposed to a consistent approach to assessment and learning from the very beginning of medical school. The clerks participating in this study admitted they did not have a good understanding of the term “formative assessment” which would suggest they would also benefit from some curricular time devoted to helping them to understand broader concepts of learning in medical education including theories of self-regulated learning and the roles of assessment, feedback, and reflection in their learning. They should be encouraged to be proactive in their learning throughout the pre-clerkship curriculum, so that these skills are well established before they start clerkship. They should then receive appropriate orientation about how to translate their self-regulated learning skills into workplace-based learning settings. Ideally, this would all culminate in clerks who are ready to be shared participants in seeking formative assessment and feedback in order to support their learning. In addition to medical students receiving information on formative assessment and related
concepts, teachers will require assistance and support to change assessment practices to enhance formative assessment opportunities and to embrace a model of shared responsibility for assessment with learners.

**Standards for clerk performance.**

Discussions of formative assessment in the literature highlight the need for accepted standards or criteria against which to measure clerk performance (Sadler, 1998). Clerkship-specific criteria have not yet been developed, although the Queen’s University undergraduate medical education competency framework (Queen’s University School of Medicine Curriculum Committee, 2011) provides an overview of the what the “competent medical graduate” (p. 9) will be able to do, but the descriptors are not very precise, and these are the expectations of a clerk at the end of clerkship only. By introducing his novel assessment form that explicitly uses the Reporter-Interpreter-Manager-Educator framework (DeWitt, Carline, Paauw, & Pangaro, 2008), Dr. Bond is starting to develop these descriptors for internal medicine. This is an important step, but it is not sufficient on its own. A dialogue between different stakeholders will be required to negotiate these standards, including input from students, attending physicians, residents, residency programs (who will inherit the clerks as newly minted residents), and others. Having standards defined will assist clerks by giving them clear standards against which they can self-assess their performance, and will assist supervisors in assessing clerks against the standard, in order to provide high quality feedback. Those involved in the dialogue will also need to determine if the standards should be consistent across the clerkship, or if there are expectations of more advanced standards as clerks progress through clerkship. Regardless of the decision, these clerkship standards should be explicit on assessment forms, to “help clarify what good performance is” (Nicol & Macfarlane-Dick, 2006, p. 205).

**Faculty and resident development to support formative assessment.**

Both attending physicians and residents indicated they would welcome training on how to best supervise and assess clerks; many admitted they had never received any teaching on the subject. Faculty development for attending physicians should include not just concepts of formative assessment and related concepts (e.g., self-regulated learning), but should equally focus on strategies to embed formative assessment and feedback into most clinical activities, and strategies to involve the learner. Once there are clerkship standards for performance, attending physicians should be oriented to as to what these are, how to reference them in their assessment practices, and, if applicable, how skills should develop over the length of the clerkship. Additionally, a needs-assessment could be carried out with current attending physicians to determine other areas for faculty development and to determine their
thoughts as to the effective strategies to deliver this faculty development. All new attending physicians who will supervise clerks should undergo a formal orientation to the clerk supervision role and all it entails. However, there is also a need for faculty development for pre-clerkship teachers to incorporate these concepts into pre-clerkship courses. Fortunately, at Queen’s University many pre-clerkship faculty members also act as attending physicians and supervise clerks, which should facilitate the process.

Residents require orientation and training at the start of their residencies and throughout their programs about their roles in the supervision and assessment of clerks. Once again, this should involve more than a simple introduction to concepts of formative assessment, but rather to theories and approaches that support learning, including those of self-regulated learning. A significant advantage with residents is that they are still explicitly learners, so they have the potential to apply what they have learned to their own learning as they progress through residency, as well as in their supervisory roles.

The data suggest that junior residents play a significant role in clerk learning, so this training should not wait until residents are deemed senior. Rather, a graduated program throughout residency programs is required. In terms of the Core Internal Medicine course, this would also include clarification of roles of off-service residents, (i.e., residents from programs other than internal medicine) who only rotate through internal medicine for eight weeks at a time, in addition to the roles for internal medicine residents, both junior and senior.

Optimizing CTU structure.

As noted by all participants, there are a number of concerns about the CTU structure that affect both patient care and clerk learning. A number of issues have been addressed in recent years as part of preparation for the post-graduate accreditation process in 2011 (Personal communication, Dr. Program Director, September 2011), but there remain the concerns about the patient load on the CTUs, the geographical distribution of patients in the hospital, and the size of the CTU teams in terms of learners, amongst other administrative concerns (Drs. T, U, V, W, X, Y, & Z). In reviewing these ongoing challenges, it might be helpful to seek the input of clerks about how these barriers affect their learning, as the issues may not be identical to those faced by residents and attending physicians.

Institutional recognition of clerk supervision.

Whereas Queen’s University officially recognizes and values teaching in the pre-clerkship curriculum (which is captured on the attending physician’s annual report), the supervision of clerks in clinical settings is not recognized as a teaching deliverable per se. Faculty members in the Department of Medicine receive credit for the
number of weeks they spend as attending physicians on clinical teaching units, and the requirement for supervision of clerks is embedded there (Personal Communication, Head, Department of Medicine, January 9th, 2011). According to the data from this study, it is not clear to attending physicians if the credit allotted fully captures the time required for appropriate supervision and assessment of trainees at multiple levels, including clerks on a busy clinical service with high patient volume and significant patient complexity.

This issue is particularly complex, as it overlaps both the undergraduate and postgraduate training programs in medicine due to the mixed nature of the teams. It may be that the School of Medicine needs to review the credit and time allotted to CTU supervision to determine if it reflects the current role. If it underestimates the time required, then it is likely contributing to the competing pressures concern voiced by so many attending physicians. Regardless, it appears there should be a discussion of the time required to fulfill the roles and responsibilities required to supervise clerks appropriately. This will require an interesting discussion about what time and resources are required to supervise and assess clerks, and once again, will require a review of the principles underlying assessment and learning in clerkship settings.

**Course director support.**

Similarly to the discussion in the previous section, it is unclear if the role of the course director in internal medicine receives adequate support, either in terms of time protection or in terms of other supports (i.e., administrative and technical support). Given that the Core Internal Medicine Course director also has a great deal of CTU supervision responsibilities, it may be that if the recognition of the time required there is reviewed, this may alleviate some of the current competing responsibility concerns. This question could be reviewed at the same time as a review of the CTU supervisory role.

**Change in culture.**

Unfortunately, all of the above recommendations will not likely succeed in changing clerks’ experiences with assessment and learning in general, and formative assessment in particular, without a shift in the culture around how we train doctors and how our students learn. The current model of CTU supervision grew out of older models with fewer learners and patients who were not as medically complex. In addition, current supervisors are generally products of current (or older) models, and are often unfamiliar with current theories of learning. This cultural shift may start to emerge if all relevant stakeholders are engaged in the recommendations listed above. The more that supervisors and students are engaged in the process for change, the more they will learn about current theories of
assessment and learning. If supervisors are actively involved in the dialogue around developing standards for clerk performance, they may be more engaged in the active assessment of clerks against these standards; and if students are involved, they may more actively self-assess and take more responsibility for their learning. Finally, if there is a careful review of how supervision of clerks is valued at Queen’s, and a review of the current CTU structure, through a process that engages current clerk supervisors, it may be that the systemic barriers that currently exist to optimal supervision and assessment of clerks may be addressed. As all the previous recommendations are being reviewed, the importance of working towards a cultural shift should be made a priority, in order to enhance the chances of success in addressing the current concerns.

**Applying Recommendations in Other Settings**

This study was designed specifically to explore clerks’ experiences with assessment and learning on the Core Internal Medicine Clerkship course at Queen’s University. Readers may be interested in the recommendations from this study as they might apply in other settings. While many of the recommendations may well be applicable in different clerkship courses at Queen’s University or in other institutions, there are some factors to be considered before doing this.

First, this study purposefully sampled the experiences of novice and senior clerks, to try to understand if there were differences in clerks’ experiences at the beginning and at the end of clerkship. There are, however, six other sets of clerks who were not part of this study, and because of how the clerkship is structured, there are differences in clerks in each block. For example, a clerk who is doing internal medicine in block 4 might still be interested in internal medicine as a career like the Block 2 clerks, but they are almost halfway completed their clerkship, so their level of training is more advanced. As well, although 11 of 12 Block 2 clerks participated, only 4 of 12 Block 8 clerks participated, and those non-participating clerks might have had very different block 8 experiences than the clerks who participated, especially since, by chance, the participating clerks were only on two of four CTU teams. Further exploration of clerks’ experiences, either by discussion or by formal study will help to answer the question of how similar these clerks’ experiences are to other clerks.

Secondly, this study focused only on the Core Internal Medicine course, which is an exclusively inpatient and team-based clerkship course, and is quite different than courses that are based in ambulatory settings, or that are primarily preceptor-based (where a clerk works with only one attending physician over the length of the rotation). Readers are encouraged to refer to the context section in Chapter 1 to determine how the Core Internal Medicine
context is similar or dissimilar to other settings, and to the comments by the clerks and supervisors, which richly describe their experiences in this setting, to determine if there is merit in considering the recommendations above in their own context.

Finally, my role as the investigator in the study must be considered. All the clerks in the study have known me since their first year in medical school, since I have consistently held educational leadership roles and have had responsibility for significant portions of their curriculum. By design, I ensured that I would not be required to supervise any of the participating clerks in any mandatory settings subsequent to the study. However, it could still be argued that I hold a position of power with respect to the clerks, which could have affected their responses to my questions and the study in general. I was conscious of this during all portions of the data collection and analysis. While I personally carried out the initial interviews and the final focus groups, I designed the on-line questionnaires to be anonymous to ensure that clerks had opportunities to provide answers that could not be traced to them.

From reflecting on the experience, I feel that the issue regarding my possible position of power did not have significant impact, if any, on the clerks’ responses. Rather, in reviewing the data, I was struck by the fact that the clerks appeared to be remarkably open and honest in describing their experiences, and that they appeared to feel I appreciated their context. It was helpful, I feel, that I am a physician that they know. This allowed them to use medical terminology, both formal and informal, to describe specific patient encounters, and since I understand the context, I could interpret their responses. They also used abbreviations and colloquialisms in describing the setting where they worked, again, because they knew they didn’t need to explain it to me. They understood that I do not have oversight over the clerkship in general (my leadership positions are all in the pre-clerkship curriculum), or the Core Internal Medicine Clerkship course in particular, so they had no need to be concerned about my reaction to their criticism of the systems they experienced, as I personally had played no part in designing them.

In addition, the clerks at Queen’s University are very accustomed to having their feedback sought in terms of their learning experiences. From the first day of orientation (in which I participate as the Director of Year 1) we provide a number of options for lines of communication from the students to the faculty and the leadership, from frequent meetings with elected student academic representatives up to and including an anonymous electronic portal to provide feedback directly to the Associate Dean for Undergraduate Medical Education. When I was recruiting clerks for the study, they often asked how the study would help Queen’s University, and they generally expressed gratitude that I was exploring clerkship from their perspective.
In summary, while I do hold leadership positions at the School of Medicine, in reflecting on the data collection processes with clerks, I did not detect any hints that this impeded clerks from providing fully open and honest answers. In fact, it appeared to be an advantage in that they knew me and seemed to trust me, and they felt very comfortable participating in the study.

Similarly, most of the attending physicians I interviewed either knew me or knew of my role. They appeared to feel that I understand their context, in that I have very similar clinical and supervisory responsibilities with respect to patient care and trainee supervision. Once again, they were free to use whatever language was most comfortable to them, because I was their peer. The eight participating attending physicians were purposefully sampled in that they were supervisors of participating clerks, but there were a few attending physicians who did not respond to the email invitation to participate. In addition, the eight attending physicians represent a small minority of the physicians who take on attending physician roles on the CTU over the course of a year, and their perspectives could be quite different than those who did not participate. Most of the participating attending physicians were cited by the clerks as having been particularly helpful to their learning, and this is an important lens through which to view their data.

By contrast, I suspect that part of my challenge in recruiting residents to my study is that I am not known to most of them at Queen’s University. Residents have very high workloads, and it might be hard to engage them in a study by someone they don’t know, and where there might not be any tangible benefit obvious to them. This can only be confirmed with further study, however. It is relevant in interpreting the resident data, however, in that only a very small minority of residents who worked with the clerks participated in the study.

**Topics for Future Research**

Two main questions persisted throughout this study relating to the resident roles in the clerks’ learning experience: one relates to resident perspectives on this role, and one relates to the role of junior residents. The clerk data highlights the crucial role that residents play in their learning, but since only five residents participated in the study, resident perspectives have not been fully explored. In fact, it’s unclear why it was so difficult to recruit residents for the study, and that is an interesting question as well. A future study targeting residents would help to answer questions around how residents approach supervision of clerks, and what supports they require to enhance this role, especially given their dual supervisor/learner roles.
In addition, the role of junior residents should be explored further. Junior residents work closely with clerks and were often cited by participating clerks as significantly positive or negative influences on clerk learning. The current CTU structure does not provide them with an explicit role, and it appears this is a something that might be worth exploring. The perspective of junior residents was not well represented at all in this study with only one participant, and this is a key area for further research. If it is possible to implement a faculty development program and a resident training program as described in the previous section, this would be a very interesting opportunity for further study around their perspectives on supervising and assessing clerks. All attending physicians and residents were interviewed individually for this study, but a focus group would permit further exploration of some of the themes that emerged, especially around barriers, to explore possible solutions, and to better understand the barriers.

Finally, coming back to a clerk perspective, it is relevant to note that, with rare exceptions, all clerks become residents who will then be in a position of supervising clerks. This study did not specifically explore clerks’ perceptions on their future roles of supervising and assessing others, and this would be a particularly interesting area for study. Starting to build the roles of supervisor/assessor for clerks early on might help to facilitate that transition to junior resident, senior resident, and then, ultimately to attending physician.

Final Words

As an experienced educator yet novice researcher, a significant finding for me was the dedication to learning expressed by each and every participant in my study. It was clear that even with all the challenges raised, clerks, residents, and attending physicians value learning, and consider this to be an essential role in their lives. At no point did any participant express feelings of defeat with respect to the shared goal of helping clerks become doctors, even if, at the time they were participating in the study, they were discouraged. In the end, this was very inspiring to me to reflect on my own teaching, and it is a key message I hope to bring forward as I share the results of the study.
References


Queen’s University School of Medicine Curriculum Committee. (2011). *Queen’s undergraduate medical education competency framework.* Unpublished. Queen’s University, Kingston, Canada.


Appendix A

Mini Physical Exam Form

**MINI PHYSICAL EXAM (MINI-PEX)**
**CLERKSHIP: SUBSPECIALTY ASSESSMENT**

1) **DATE:**

2) **NAME OF CLERK:**

3) **NAME OF EVALUATOR:**

4) **ROTATION SUBSPECIALTY:**

4) **MINI-PEX TASK:**

5) **PATIENT’S AGE:**

6) **PATIENT’S MAJOR DIAGNOSIS:**

7) **EVALUATION SETTING (IN-PATIENT, ER, CLINIC):**

---

**EVALUATION PARAMETERS:**

<table>
<thead>
<tr>
<th>NEEDS IMPROVEMENT</th>
<th>SATISFACTORY</th>
</tr>
</thead>
</table>
| 1) Humanistic Qualities  
(rapport with patient, attitude of clerk) |             |             |
| 2) Professionalism  
(attention to patient comfort, privacy, proper draping) |             |             |
| 3) Organization and efficiency of physical exam  
(time management, minimize changing patient positions) |             |             |
| 4) Competency in performing task properly |             |             |
| 5) Overall evaluation of MINI-PEX |             |             |

**COMMENTS:**

---

**EVALUATOR’S SIGNATURE:**

**CLERK’S SIGNATURE:**
MINI PHYSICAL EXAM (MINI-PEX)
CLERKSHIP: SUBSPECIALTY ASSESSMENT

Suggested list of possible physical exam tasks to be completed in under 5 minutes (this is a guide ONLY and evaluators are welcome to use own):

- lymph nodes
- thyroid
- eye exam
- examination of lung fields
- JVP and carotid
- Precordial exam
- Peripheral pulses (including assessment of bruits)
- Breast exam
- Abdominal exam
- MSK exam (could limit to specific region) under 5 minutes
- Neuro exam (could limit to specific aspect like cranial nerves, peripheral sensory and motor, cerebellar assessment <5 minutes)
- Cognitive assessment
- Gait assessment
### Clerkship Mid-Rotation Evaluation Form

Please visit [https://meds.queensu.ca/central/community/eddev:bayer_feedback_grid](https://meds.queensu.ca/central/community/eddev:bayer_feedback_grid) for info about the feedback cues on this form.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Will require significant improvement to meet objective</th>
<th>Will require some improvement to meet objective</th>
<th>Progressing well to meet objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Must provide supporting comments if you note that improvement is required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates history-taking that is relevant, concise and accurate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performs a physical examination that is relevant and accurate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selects and interprets diagnostic tests appropriately and accurately.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to problem solve and develop an appropriate differential diagnosis.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describes appropriate management options for patient cases relevant to this course.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrate appropriate professional behaviours.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communicates effectively in oral and written form.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to work collaboratively with a patient care team.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participates effectively in teaching and learning opportunities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates personal and professional awareness and insight and appropriately accepts supervision and feedback</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Clerkship Mid-Rotation Evaluation form

Please visit https://meds.queensu.ca/central/community/eddev.hayer_feedback_grid for info about the feedback cues on this form

This student has logged at least 50% of the mandatory encounters in this course: Y/N (if not, please document discussion and plan regarding this concern.)

<table>
<thead>
<tr>
<th>This student demonstrates strength in the following area(s):</th>
<th>These have been identified as opportunities for improvement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Continue”</td>
<td>“Stop” or “Do more”</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suggested actions to enhance student learning/performance “Do more” and “Consider”:

Faculty signature ___________________________________________  Student signature ___________________________________________

Date ____________________________  Date ____________________________
Appendix C

Core Medicine Clerkship Final Assessment Form

Core Medicine Clerkship Final Assessment Form

Clerk:

Rotation dates:

<table>
<thead>
<tr>
<th>Foundational knowledge</th>
<th>Inconsistently meets expectations</th>
<th>Meets expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Does not meet expectations</td>
<td>• Identifies and applies relevant aspects of normal anatomy/physiology.</td>
</tr>
</tbody>
</table>

| History taking |                                  | • Relevant, concise, accurate. |

| Physical exam  |                                  | • Performs relevant examinations correctly; • Accurately identifies positive, and pertinent negative findings |

| Select tests   |                                  | • Selects appropriate diagnostic tests |

| Interpret tests|                                  | • Interprets diagnostic tests appropriately |

| Differential diagnosis |                                  | • Demonstrates problem solving ability; • Develops plausible differential diagnosis; • Able to accurately identify most likely diagnosis |

| Management plan |                                  | • Outlines reasonable management plan for common and important presentations; • Formulates preventative measures into management as appropriate; • Adjusts plans in response to patient’s course |

<p>| Professional behaviour |                                  | • Demonstrates honesty, integrity, commitment, dependability, compassion, respect and confidentiality in clinical practice. |</p>
<table>
<thead>
<tr>
<th>Core Medicine Clerkship Final Assessment Form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team functioning</strong></td>
</tr>
<tr>
<td>* Works with others effectively</td>
</tr>
<tr>
<td><strong>Risk factor identification/ modification</strong></td>
</tr>
<tr>
<td>* Communicate with the patient/patient’s</td>
</tr>
<tr>
<td>family with regard to risk factors and</td>
</tr>
<tr>
<td>their modification.</td>
</tr>
<tr>
<td><strong>Interprofessional collaboration</strong></td>
</tr>
<tr>
<td>* Analyze and reflect on successful team</td>
</tr>
<tr>
<td>interaction to promote effective</td>
</tr>
<tr>
<td>collaboration.</td>
</tr>
<tr>
<td>**Actively participates in learning</td>
</tr>
<tr>
<td>opportunities**</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Accepts supervision and feedback</strong></td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>**Balances personal, educational and</td>
</tr>
<tr>
<td>clinical priorities**</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

This student demonstrated the following area(s) of distinction during this clinical rotation. (If you feel that this student should be considered for an award, please include this in this area):
### Core Medicine Clerkship Final Assessment Form

**Continue...**
Comment on aspects of performance that were effective. Be specific and describe impact. Highlight things you would like to be done in the future.

**Start, or do more...**
Identify behaviour the student knows how to do, and could do, or do more often.

**Consider...**
Highlight a point of growth for the learner, a "doable" challenge for future interactions.

**Stop, or do less**
Point out actions that were not helpful, or could be harmful. Be specific, and indicate potential impact.

**Other comments from evaluator:**

---

**Evaluator signature and date:** ____________________________

**Student comments (and signature):**

---

**Course Director Section:**

Logging reviewed by course director (circle one): Yes No  Logging completed at end of second medicine block: Yes No

If no, plan for remediation: _____________________________________________________________

Course Director signature and date of review: ____________________________________________

[3]
Appendix D

Core Medicine Mid-block Assessment Form

Core Medicine Mid-block Assessment

Date: ____________________

Student name: ________________  Attending name: ____________________

Student signature: ________________  Attending signature: ____________________

Reporter – able to reliably, respectfully, and honestly gather information, write basic notes, differentiate normal from abnormal, and present their findings. An example would be a clerk able to gather all of the information, and present it in an appropriately structured manner, but with a lack of interpretation or application of the information.

Interpreter – able to present a patient case, select the important issues, offer differential diagnoses, and support arguments for or against various diagnoses. An example would be consistently demonstrating a well-structured presentation, with appropriate diagnostic interpretation, but lacking a comprehensive plan to address the active issues.

Manager – able to present the case, offer a differential diagnosis, and formulate diagnostic and therapeutic plans. An example would be consistently demonstrating clear ability to gather and interpret information, and to further apply an effective and comprehensive treatment plan. When clinical complications arise, there are limitations in the ability to search out the solutions independently.

Educator – able to do all of the above skills, plus defines important questions, research information regarding the topic, and educates others. An example would be identifying, presenting, and critiquing an important clinical trial on rounds that is relevant to a particular clinical problem in a patient.

Please mark an X to rate the clerk on a continuum

<table>
<thead>
<tr>
<th>Reporter</th>
<th>Interpreter</th>
<th>Manager</th>
<th>Educator</th>
</tr>
</thead>
</table>

Continue... (comment on aspects of performance that were effective and why)

Start/do more of... (comment on behaviour the student can or could do that they should do more often)

Consider... (comment on doable challenges that will help the clerk move towards operating in the manager or educator roles)

Stop/do less... (comment on attitudes or behaviours that were felt to be counterproductive to the clerk’s performance or development)
Comprehensive role descriptions of the RIME model in consideration of Queen's competencies.

Reporter
At the "reporter" level, the trainee can accurately gather and clearly communicate the clinical facts about his or her own patients. He or she consistently shows the basic skills required to obtain a history, do an appropriately focused physical examination, and has the basic knowledge of what to look for. At this level, the learner should be able to identify specific psycho-social challenges facing his or her patients. This descriptor emphasizes day-to-day reliability and professionalism in patient and team interactions. The trainee at this stage has a sense of responsibility and is achieving consistency in bedside skills and interpersonal relationships with patients. Oral and written communication skills are consistent in meeting the basic expectations of a clinical clerk. The reporter is able to effectively balance personal, educational, and clinical priorities.

Interpreter
The student again consistently gathers an accurate history and performs an appropriate exam. Further, he or she can prioritize among problems identified in his or her time with the patient. At this level an appropriate differential diagnosis should be consistently generated. He or she is able to select and correctly interpret basic diagnostic tests relevant to the clinical presentation. The interpreter step requires a higher level of knowledge, and the ability to establish and correctly order a differential. Further, at the interpreter level the student can identify knowledge gaps and use a variety of resources to fill those gaps. He or she is also aware of the impact of his or her own biases on his or her clinical interpretation. The learner transitions from being a "bystander" to seeing himself or herself as an active participant in patient care.

Manager
This step takes even more knowledge, more confidence, and more judgment in deciding when action needs to be taken, and proposing and selecting treatment options for patients. At this stage a trainee must be able to identify and address risk factors, prognostic factors and patient specific challenges that will impact on the plan or care. This requires higher-level interpersonal skills, including the skills needed to educate patients. Also understands the relevance or resource utilization to clinical decision-making. This level calls for the ability to communicate clearly with colleagues, consultants, and the multidisciplinary team, to deliver bad news to patients, and to answer more complex management questions.
(In procedural or operative specialties, technical and manual skills fit in here, but proficiency in them would not outweigh deficiencies as a reporter or interpreter.)

Educator
The learner at this level has mastered the expectations of the manager. To be an “educator” the learner must be able to go beyond the required basics, to read deeply, and to share new learning with others. It also means having the insight to define important questions to research in more depth, the drive to look for hard evidence on which clinical practice can be based, and the skill to know whether the evidence will stand up to scrutiny. The advanced trainee also has the maturity and confidence to share in educating the team (and even the faculty). An example is presenting a randomized controlled trial on rounds, assessing the reliability of the findings of the study, and critically applying those findings to clinical decision making on a patient.
Appendix E

Mandatory Logging Requirements for Core Internal Medicine

The following list outlines the MANDATORY clinical presentations and tasks that must be accomplished by the student in order to successfully complete the two Medicine courses. These are logged online in MedTech and will be reviewed after the first rotation to ensure progress is being made and again at the end of both rotations to see that they have been completed.

Please also see the MCC presentation list for the topics which you need to study (but you may not see) during your time on this rotation:

1. Abdo pain-chronic
2. Anemia
3. Chest pain
4. Cough
5. Delirium/confusion
6. Dementia
7. Diabetes mellitus
8. Dyspnea-chronic
9. Edema
10. Fever
11. H+ concentrtn, abn
12. Hypertension
13. Hypotension
14. Impaired LOC (coma)
15. Joint pain, poly
16. Murmur
17. Potassium-abn
18. Renal failure
19. Sodium-abn
20. Weakness
21. Consultation request (task)
22. Dictation/eDischarge (task)
23. Dictation/consultation letter (task)
In addition to the MCC presentations outlined in the Mandatory Encounters section, students are expected to use a combination of clinical experiences, formal teaching and independent learning opportunities to meet the educational goals of the MCC presentations listed below:

1. Abdominal distension (MCC 1)
2. Blood from GI tract (MCC 6)
3. Blood in sputum (MCC 7)
4. Blood in urine (MCC 8)
5. Coagulation problems
   1. Bleeding tendencies (MCC 15-1)
   2. Hypercoaguable state (MCC 15-2)
6. Constipation (MCC 16-1)
7. Diarrhea (MCC 22-1 and 22-2)
8. Dizziness/vertigo (MCC 24)
9. Dysphagia (MCC 26)
10. Electrolyte abnormalities
    1. Hyper/hypocalcemia (MCC 12-1, 12-2)
    2. Hyper/hypophosphatemia (MCC 12-3, 12-4)
11. Falls (MCC 32)
12. Fatigue (MCC 33)
13. Gait/ambulation/movement problems (MCC 35)
14. Headache (MCC 39)
15. Liver disease
    1. Liver function tests abnormal (MCC 52) OR
    2. Hepatomegaly (MCC 2-2) OR
    3. Jaundice (MCC 49)
16. Lymphadenopathy (MCC 54)
    1. Mediastinal mass (MCC 54-1)
17. Neck mass/thyroid problem (MCC 63)
18. Pain, periarticular/soft tissue rheumatic disorders (MCC 58-3)
19. Seizures (MCC 92)
20. Syncope (MCC 106)
21. WBC problems (MCC 120)
22. Weight loss/gain (MCC 118-1, 118-2)
Appendix F

Health Sciences Research Ethics Board Approval – Initial and Amendment

November 16, 2011

Dr. Michelle C Gibson
School of Medicine
Queen’s University

Dear Dr. Gibson,

Study Title: SMED-069-11 A Qualitative Study of Formative Assessment Practices in an Internal Medicine Clerkship Course

File # 6006428

Co-Investigators: Dr. L. Shulha

I am writing to acknowledge receipt of your recent ethics submission. We have examined the protocol, interview guides, letter to supervisors, letter to students, consent form for students, consent form for supervisors for your project (as stated above) and consider it to be ethically acceptable. This approval is valid for one year from the date of the Chair’s signature below. This approval will be reported to the Research Ethics Board. Please attend carefully to the following listing of ethics requirements you must fulfill over the course of your study:

Reporting of Amendments: If there are any changes to your study (e.g. consent, protocol, study procedures, etc.), you must submit an amendment to the Research Ethics Board for approval. Please use event form: HSREB Multi-Use Amendment/Full Board Renewal Form associated with your post review file # 6006428 in your Researcher Portal (https://services.queensu.ca/romeo_researcher/)

Reporting of Serious Adverse Events: Any unexpected serious adverse event occurring locally must be reported within 7 working days or earlier if required by the study sponsor. All other serious adverse events must be reported within 15 days after becoming aware of the information. Serious Adverse Event forms are located with your post-review file 6006428 in your Researcher Portal (https://services.queensu.ca/romeo_researcher/)

Reporting of Complaints: Any complaints made by participants or persons acting on behalf of participants must be reported to the Research Ethics Board within 7 days of becoming aware of the complaint. Note: All documents supplied to participants must have the contact information for the Research Ethics Board

Annual Renewal: Prior to the expiration of your approval (which is one year from the date of the Chair’s signature below), you will be reminded to submit your renewal form along with any new changes or amendments you wish to make to your study. If there have been no major changes to your protocol, your approval may be renewed for another year.

Yours sincerely,

[Signature]

Chair, Research Ethics Board
December 06, 2011

Investigators please note that if your trial is registered by the sponsor, you must take responsibility to ensure that the registration information is accurate and complete
Amendment Acknowledgment/Approval Letter

March 30, 2012

Dr. Michelle Gibson
\School of Medicine
Queen's University

File #: 6006428 SMED-069-11 A Qualitative Study of Formative Assessment Practices in an Internal Medicine Clerkship Course

Dear Dr. Gibson

I am writing to acknowledge receipt of the following:

- Request to recruit Block 2 students
- A copy of the revised student information letter

I have reviewed these materials and hereby give my approval. Receipt of these amendments will be reported to the Health Sciences Research Ethics Board.

Yours sincerely,

[Signature]
Albert Clark, Ph.D.
Chair
Research Ethics Board
Appendix G

Information Letters

Dear Student

Re: A Qualitative Study on Formative Assessment in an Internal Medicine Clerkship Course

You are invited to participate in a project entitled “A Qualitative Study on Formative Assessment in an Internal Medicine Clerkship Course” during your Core Internal Medicine Course in clerkship. This letter provides you with background information to the study and the nature of what would be required by a participating student.

This project is being undertaken as part of my Master’s in Education thesis, and as part of the W.D.Dauphinee fellowship I received from the Medical Council of Canada to further my knowledge about assessment practices in medical education. The goal of the study is to better understand what formative assessment practices are actually occurring within the core internal medicine clerkship course at Queen’s. This study will help to identify the strengths and weaknesses of our current system, and will help to inform improvements to the current system.

All students who are enrolled in Core Internal Medicine in blocks 2 and 8 in 2012 are being invited to participate. Participation will include the following:

1) A 30-minute interview to be scheduled at your convenience before you start your internal medicine rotation,
2) Weekly anonymous electronic journaling for approximately 15 minutes weekly for the 5 or 6 weeks of your rotation,
3) And, a 30-minute interview or 60-minute focus group at the end of the rotation, again scheduled at your convenience.

I will be following up with you shortly with a personal email to discuss if you are willing to participate, and to answer any questions you might have. Meanwhile, if you have any questions about the study, please email me at gibson@queensu.ca, my supervisor Dr. Lyn Shulha at lyn.shulha@queensu.ca, or Albert Clark, Chair, Health Science Ethics Review Board 613-533-2975 or at clarkaf@queensu.ca.

Sincerely,

Michelle Gibson
Director, Year 1, Queen’s School of Medicine

Additional Information:
Participation in this research is entirely voluntary and choosing not to participate will not result in any adverse consequences. Furthermore, you are free to refuse to answer any question and to withdraw from the project at any point in time without concern about repercussions. All responses will be held in strictest confidence. Only the researchers will have access to the data. The results of this project will be coded in such a way that the individual identity will not be attached in any way to the final data produced. There are no known risks affiliated with participating in this research. Confidentiality of participants will be maintained throughout the study. This includes publication of the results. The data may also be used for presentations as well as in similar research project should the opportunity arise. Should such secondary uses of the data be required, confidentiality of participants will be maintained.
Dear Doctor,

Re: A Qualitative Study on Formative Assessment in an Internal Medicine Clerkship Course

You are invited to participate in a project entitled “A Qualitative Study on Formative Assessment in an Internal Medicine Clerkship Course” during your Core Internal Medicine Course in clerkship. This letter provides you with background information to the study and the nature of what would be required by a participating attending physician or resident.

This project is being undertaken as part of my Master’s in Education thesis, and as part of the W.D. Dauphinee fellowship I received from the Medical Council of Canada to further my knowledge about assessment practices in medical education. The goal of the study is to better understand what formative assessment practices are actually occurring within the core internal medicine clerkship course at Queen’s. This study will help to identify the strengths and weaknesses of our current system, and will help to inform improvements to the current system.

All supervisors (residents and attending physicians) of participating medical students are being invited to participate. Participation will involve participating in a 30-minute interview to be scheduled at your convenience at some point while you are supervising the medical student.

I will be following up with you shortly with a personal email to discuss if you are willing to participate, and to answer any questions you might have. Meanwhile, if you have any questions about the study, please email me at gibson@queensu.ca, my supervisor Dr. Lyn Shulha at lyn.shulha@queensu.ca, or Albert Clark, Chair, Health Science Ethics Review Board 613-533-2975 or at clarkaf@queensu.ca.

Sincerely,

Michelle Gibson
Director, Year 1, Queen’s School of Medicine

Additional Information:
Participation in this research is entirely voluntary and choosing not to participate will not result in any adverse consequences. Furthermore, you are free to refuse to answer any question and to withdraw from the project at any point in time without concern about repercussions. All responses will be held in strictest confidence. Only the researchers will have access to the data. The results of this project will be coded in such a way that the individual identity will not be attached in any way to the final data produced. There are no known risks affiliated with participating in this research. Confidentiality of participants will be maintained throughout the study. This includes publication of the results. The data may also be used for presentations as well as in similar research project should the opportunity arise. Should such secondary uses of the data be required, confidentiality of participants will be maintained.
Appendix H

Letters of Consent

Clerk Consent

A Qualitative Study of Formative Assessment Practices in an Internal Medicine Clerkship Course

Thank you for agreeing to participate in this study examining formative assessment practices in the Core Internal Medicine Course at Queen’s University. This letter will outline the purpose of the full study.

The project is being conducted by Dr. Michelle Gibson, as part of my research into the role of formative assessment in clinical rotations. Medical education literature has described and studied many models of formative assessment in clerkship settings, but there is little literature that describes what students and supervisors are actually experiencing in terms of formative assessment during clerkship rotations. The ultimate goal is to help design new systems that support formative assessment in clerkship courses at Queen’s.

With your approval, the interview(s) or focus groups will be recorded on audiotape for transcription purposes. Anonymity will be maintained throughout the project in that a pseudonym will be used during the transcription of the audio recorded interview and only the researcher will have access to or knowledge of the names of individual students, faculty, or residents participating in the interview process.

Your weekly journals will be submitted anonymously in an electronic format, so at no time will your identity be known by the researcher with respect to these submissions.

Your signature below acknowledges that you have volunteered to participate as a subject in this study. Prior to providing consent, please read the following statements regarding your participation in this study:

• This study focuses on student and supervisor experiences with formative assessment in the core internal medicine clerkship course at Queen’s.
• Involvement in this research will require participating in one interview, plus a follow-up interview or a focus group; and journaling weekly on your experiences with formative assessment during your core internal medicine clerkship rotation
• Participation in this study is voluntary, and may be terminated at any time by request. As well, you may chose not to answer any question. Participation in this project and/or withdrawal from this project will not affect you adversely in any way.
• This study will not involve any greater risks than those ordinarily occurring in daily life. It is not possible to identify all potential risks in any study, but note that all reasonable safeguards have been taken to minimize potential risks.
• The results of this research may be published or reported to government agencies, funding agencies, or scientific groups, but your name will not be associated in any way with any published results.
• The purposes and the procedure of the study have been satisfactorily explained.
• I have read and kept a copy of the letter of information and letter of consent.

______________________  ____________________________________
Signature of student  Person obtaining consent
______________________  ____________________________________
Date  Date

In the event that you have any questions, please feel free to contact the researcher, Dr. Michelle Gibson at 613-548-7222 ext 2208 or Gibson@queensu.ca or Dr. Lyn Shulha (supervisor) at lyn.shulha@queensu.ca.

In the event that you have any questions, concerns or complaints, please feel free to contact: Dr. Albert Clark, Chair, Ethics Review Board, 613-533-6081 or at clarkaf@queensu.ca.
Supervisor Consent

A Qualitative Study of Formative Assessment Practices in an Internal Medicine Clerkship Course

Thank you for agreeing to participate in this study examining formative assessment practices in the Core Internal Medicine Course at Queen’s University. This letter will outline the purpose of the full study.

The project is being conducted by Dr. Michelle Gibson, as part of my research into the role of formative assessment in clinical rotations. Medical education literature has described and studied many models of formative assessment in clerkship settings, but there is little literature that describes what students and supervisors are actually experiencing in terms of formative assessment during clerkship rotations. The ultimate goal is to help design new systems that support formative assessment in clerkship courses at Queen’s.

With your approval, the interview will be recorded on audiotape for transcription purposes. Anonymity will be maintained throughout the project in that a pseudonym will be used during the transcription of the audio recorded interview and only the researcher will have access to or knowledge of the names of individual students, faculty, or residents participating in the interview process.

Your signature below acknowledges that you have volunteered to participate as a subject in this study. Prior to providing consent, please read the following statements regarding your participation in this study:

- This study focuses on student and supervisor experiences with formative assessment in the core internal medicine clerkship course at Queen’s.
- Involvement in this research will require participating in one interview.
- Participation in this study is voluntary, and may be terminated at any time by request. As well, you may chose not to answer any question. Participation in this project and/or withdrawal from this project will not affect you adversely in any way.
- This study will not involve any greater risks than those ordinarily occurring in daily life. It is not possible to identify all potential risks in any study, but note that all reasonable safeguards have been taken to minimize potential risks.
- The results of this research may be published or reported to government agencies, funding agencies, or scientific groups, but your name will not be associated in any way with any published results.
- The purposes and the procedure of the study have been satisfactorily explained.
- I have read and kept a copy of the letter of information and letter of consent.

____________________ ______________________
Signature of supervisor Person obtaining consent

____________________ ______________________
Date Date

In the event that you have any questions, please feel free to contact the researcher, Dr. Michelle Gibson at 613-548-7222 ext 2208 or Gibson@queensu.ca or Dr. Lyn Shulha (supervisor) at lyn.shulha@queensu.ca.

In the event that you have any questions, concerns or complaints, please feel free to contact: Dr. Albert Clark, Chair, Ethics Review Board, 613-533-2975 or at clarkaf@queensu.ca.
Appendix I

Interview guide - Clerks

This study is designed to help us understand what is actually happening with respect to assessment and learning in the core internal medicine clerkship course. This first interview will help us to understand how students learn, and how assessment impacts learning, before you start this clerkship rotation.

This interview consists of a series of questions. It should not take longer than 30 minutes. There are no right or wrong answers. With your permission the interview will be audio taped. As indicated on the consent form, only the researcher will have access to the data. Anonymity of the responses will be maintained during the reporting of the results. At any time during the interview process, you may choose not to answer a question.

Do you have any questions about the study or the use of the data before we begin?

1. I would like to start by learning about you. Please tell me:
   a. Your age
   b. What your post-secondary background was before you entered medical school
   c. What residency programs you have applied to/are planning on applying to.

2. Please think back on your clerkship experiences so far and how you have been learning to become a doctor.

3. Describe how you learn best (with respect to learning to be a doctor)?

4. Describe the learning experiences you find most useful or meaningful.
   a. What settings facilitate your learning?
   b. What are the roles of your supervisor(s) in your learning?
   c. What roles do other people play in your learning? Who are they?

5. Describe yourself as a learner
   a. What is your role in learning to be a doctor?

6. What role do assessment strategies or practices play in your learning?

7. This completes the formal part of the interview. Is there anything else you would like to add?
Appendix J

Interview guide – Attending Physicians

This study is designed to help us understand what is actually happening with respect to assessment and learning in the core internal medicine clerkship course.

This interview consists of a series of questions. It should not take longer than 30 minutes. There are no right or wrong answers. With your permission the interview will be audio taped. As indicated on the consent form, only the researcher will have access to the data. Anonymity of the responses will be maintained during the reporting of the results. At any time during the interview process, you may choose not to answer a question.

Do you have any questions about the study or the use of the data before we begin?

1. I would like to start with a series of questions about your background.
   a. Please describe your current role. (Probe- program, year of training, program)
   b. How long have you been supervising medical students at the clerkship level?

2. Please describe how often you supervise clerks on CTU? How often do you supervise clerks in other settings? Please describe these.

3. Please describe your approach to supervising clerks.

4. Explain what your responsibilities are as a supervisor.
   a. Probing (as needed): Please provide an example of how you have done this recently.
   b. What are the different tasks/jobs/roles required to supervise clerks?

5. What are conditions, settings, etc. that facilitate your ability to supervise clerks?
   a. People, settings, etc.

6. What are barriers to your being able to supervise clerks?
   a. Break down to different roles

7. What training or background do you have with respect to supervising clerks?

8. Please think of the clerks currently working on your team. Describe how you assess their performance as clerks.
   a. Probe if needed – direct observation, chart reviews, feedback from other sources – which, forms, other.

9. Is there anything Queen’s could be doing to improve your ability to provide appropriate supervision or to assess medical students?

This completes the formal part of the interview. Is there anything else you would like to add?
Appendix K

Interview guide – Residents

This study is designed to help us understand what is actually happening with respect to assessment and learning in the core internal medicine clerkship course.

This interview consists of a series of questions. It should not take longer than 30 minutes. There are no right or wrong answers. With your permission the interview will be audio taped. As indicated on the consent form, only the researcher will have access to the data. Anonymity of the responses will be maintained during the reporting of the results. At any time during the interview process, you may choose not to answer a question.

Do you have any questions about the study or the use of the data before we begin?

1. I would like to start with a series of questions about your background.
   a. Please describe your current role. (Probe- program, year of training, program)
   b. How long have you been supervising medical students at the clerkship level?

2. Please describe how often you supervise clerks on CTU? How often do you supervise clerks in other settings? Please describe these.

3. Please describe your approach to supervising clerks.

4. Explain what your responsibilities are as a supervisor.
   a. Probing (as needed): Please provide an example of how you have done this recently.
   b. What are the different tasks/jobs/roles required to supervise clerks?

5. What are conditions, settings, etc. that facilitate your ability to supervise clerks?
   a. People, settings, etc.

6. What are barriers to your being able to supervise clerks?
   a. Break down to different roles

7. What training or background do you have with respect to supervising clerks?

8. Please think of the clerks currently working on your team. Describe how you assess their performance as clerks.
   a. Probe if needed – direct observation, chart reviews, feedback from other sources – which, forms, other.

9. Is there anything Queen’s could be doing to improve your ability to provide appropriate supervision or to assess medical students?

This completes the formal part of the interview. Is there anything else you would like to add?
Appendix L

Questions – electronic questionnaire

1. Think of one or two experiences this week that you considered to be positive (i.e., a good learning experience, a realization that you have made significant progress, etc.) Please think about this broadly in terms of all the competencies that are necessary towards becoming a doctor. Describe one or two of these experiences, and why they were meaningful/helpful to you.

2. For the positive experiences you described above, please think of all the factors that contributed to the positive nature of the experience. Think of things like the setting, the people involved, the timing, things leading up to the experience, etc. Describe these factors that contributed to the positive experience, AND please describe how they contributed.

3. Think back on this week to determine if there were barriers to your learning, or things that impeded your progress towards becoming a doctor. These barriers can include settings, external factors, or actions of others, for example. Please describe these barriers or impediments.

4. Explain how the factors you described above impacted on your learning or ability to make progress this week.

5. Please include any additional comments about your learning this week.
Appendix M

Focus Group Questions

1. How did the core internal medicine clerkship course facilitate or support your learning?
   a. How did it detract from your learning?

2. How have you determined that you’ve been successful in achieving the objectives/your learning of this rotation?

3. Describe how you received your mid-rotation evaluation.
   a. Who provided it to you?
   b. How was it provided?
   c. Explain how it was useful/not useful.

4. Are there opportunities for formative assessment in this rotation?
   a. What are they?
   b. Are they useful to your learning?
   c. How or how not?
## Appendix N

### Participant Files for Analysis

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<th>Document Numbers</th>
<th>Document Names</th>
<th>Description</th>
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<td>1-4</td>
<td>I1: A8 – Initial Interview</td>
<td>Block 8 clerk interviews</td>
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