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**CLINICAL SITUATIONS OF UNCERTAINTY AND ACCESS TO RESOURCES:
A STUDY OF COMMUNITY FAMILY PHYSICIANS**

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by

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Graduate Program

In

Family Medicine

2

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Clinical Science

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The University of Western Ontario
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A Study of Community Family Physicians**

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ABSTRACT

Aims: To explore the situational factors that are present during moments of uncertainty that lead family physicians to access external resources of varying type.

Methods: Situational cues were identified using self-observational journaling. A survey was then performed to study physicians' likelihood of accessing external resources in response to each situation.

Findings: Identified situational cues included case aspects such as unfamiliar or complex presentations, potentially serious conditions, failure of previous treatments, and the patient or others in attendance being perceived as anxious, demanding, distrustful or dissatisfied. In all situations, physicians reported greatest likelihood to refer to specialists. However, with conditions that seem unfamiliar or complex, they reported similar likelihood to access internet sources, and in complex situations, to consult with peers.

Conclusions: Both medical and social situational factors led family physicians to access external resources. Consultation with specialists and peers are considered highly valued resources in managing situations of uncertainty.

Keywords: Self-assessment, Professional Self-Regulation, Uncertainty, Reflection-in-practice

CO-AUTHORSHIP

The research for this thesis was conceived, planned, and conducted by the author.

The following contributions were made:

Dr. Kevin Eva provided advice and guidance toward the research protocol and ethics submissions.

Drs. Kevin Eva and Gillian King assisted with statistical analysis of the quantitative data as well as thematic analysis of the qualitative data derived from self-observational journaling by participants and comments provided by participants in the quantitative survey.

Drs. Kevin Eva, Gillian King, and Tom Freeman provided advice and guidance in the development of the survey and in the analysis of data obtained from the qualitative and quantitative studies in this thesis.

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CHAPTER 1: INTRODUCTION

Over the last half century, researchers have sought to better understand the clinical decision-making processes of physicians and the influences on those processes, with an aim of increasing diagnostic accuracy and optimizing patient care. There are many types of decisions to be made in medical practice.¹ These include decisions about diagnosis, investigative tests and management, as well as the decision to access external resources for help when the physician is at the limit of his or her capabilities. The latter requires that physicians be able to recognize when they are at the limits of their abilities, yet little is known about the circumstances in which this occurs or the types of external resources they are likely to access in those situations. This may be of particular importance in areas of medicine such as primary care, which is characterized by broad scope of practice,² time pressures,³ and high degree of diagnostic uncertainty.^{4,5,6,7,8}

Reflection-in-practice refers to the act of considering during practice whether or not the situation one is encountering is progressing according to expectation.^{9,10} In medical practice, reflection-in-practice may be an important mechanism that leads the physician to an awareness of the feeling of not knowing – a recognition that one’s limits have been reached – and the need to “stop and think” or look to external resources in the moment of action in order to make a good clinical decision regarding a particular patient.¹¹ Reflection-in-practice is, therefore,¹¹ required to ensure effective and safe clinical decision-making but to date this process, its influences, and its effect on physician practice behavior have not been well studied.^{10,12}

This introduction will describe the unique aspects of primary care that contribute to a high degree of uncertainty and diagnostic challenge for family physicians, followed by a review of the literature on reflective practice and descriptions of its different forms and functions. The purpose of this introduction is to provide a summary of what is known about these concepts in order to identify areas in need of further research, as a basis for justifying the qualitative and quantitative studies in this thesis.

In Chapter 2, a detailed review of reflection-in-practice will be provided as an introduction to a qualitative study aimed at exploring the situational cues associated with the process of becoming aware of the need for help in clinical decision-making and prompting physicians to access assistance from an external resource.

Chapter 3 provides a summary of the literature on factors influencing physicians' decisions about patient management and reviews the research available on physicians' reactions to uncertainty and its influence on clinical practice as a prelude to a quantitative study performed to explore the relationship between the situational cues identified in chapter 2 and the type of external resource that the family physician is likely to access. Additionally, this study explores the relationship between physicians' tolerance of uncertainty and their reported likelihood of accessing different external resources when feeling uncertain.

1.1 CHALLENGES IN PRIMARY CARE MEDICINE

Primary care has been defined by Starfield as "first contact, continuous, comprehensive, and coordinated care provided to populations undifferentiated by gender, disease, or organ system."⁸ The task of the primary care physician extends beyond diagnosis and treatment; it requires integration of the patient's personal, family, and cultural context as well as the patient preferences into decision-making.^{13(p 135)} Secondary and tertiary care is provided by specialists, and is generally differentiated from primary care in being consultative and short-term in nature for problems that are relatively uncommon, for the purpose of helping primary care physicians with their diagnostic or therapeutic dilemmas.⁸

The challenges of managing a broad scope of practice in primary care have been well-described. Keeping one's knowledge base current is a significant challenge as it is

estimated that the primary care practitioner encounters 475 different clinical disease entities in any year.² Unlike in secondary and tertiary care, the prevalence of disorders and the discriminant values of signs and symptoms is lower in primary care, where conditions are often seen at an evolutionary stage when 'text book' descriptions and classifications do not apply.⁴ Further, studies suggest no disease-specific diagnosis is possible in 13 to 19 percent of patient visits in primary care^{5,6}. In one study, no organic cause was found in 84% of cases involving specific presenting complaints such as fatigue, dizziness, headache, back pain, chest pain, and abdominal pain.⁷ According to McWhinney, the family physician is often faced with illness presentations which contain a complex mixture of physical, psychological, and social elements, whereas disease is the pathological process which provides an explanatory model for illness. Family physicians often encounter patients who have no discernible pathological process; they have illness but no disease.^{13(pp 150-151)}

Because of lower discriminant values of signs and symptoms, decisions that need to be made by primary care physicians are different from those made at a secondary or tertiary care level. The precise diagnostic labels are often less important than the decisions made on the appropriate course of action. Management decisions often have to be made before a diagnosis can be established.^{13(p 149),4,14}

In primary care, there are also significant time limitations for each clinical encounter within which the diagnostic and management decisions must be made. Studies have highlighted the significant challenge of time pressures experienced by the primary care physician¹⁵ which may influence diagnostic accuracy and clinical decision making.^{16,17,18}

Thus, primary care medicine is characterized by its broad scope of work with high degree of uncertainty and time pressures in which decisions need to be made. A study of the experience of uncertainty amongst primary care physicians and the cues and

processes involved in their decision-making may further our understanding of clinical decision-making under these challenging conditions.

1.2 UNCERTAINTY

Uncertainty has been variously defined as “a cognitive state created when an event cannot be adequately defined or categorized due to lack of information” or, in health care, “the inability to determine the meaning of illness related events, which results from the ambiguity, complexity, and unpredictability of illness or deficiency of information about one’s illness and its consequences.”¹⁹

The experience of uncertainty among practicing physicians has not been well researched. Initial studies on understanding uncertainty were largely based on psychological or cognitive frameworks, focusing on risk and probability of disease as principal factors in decision making perspectives and decision making responses under hypothetical conditions of uncertainty. Many early studies on decision making involved mathematical approaches in decision analysis such as physicians’ estimates of disease probability and treatment outcomes and their confidence in their estimates, as well as risk-taking behavior and thresholds.^{20,21} However, it became clear that clinical decision-making involved more than the quantitative aspects of benefits, risks, costs, and probability-utility scores. As Moskowitz wrote, physicians do not solve clinical problems by “growing a decision tree in their heads.”²² There was a growing recognition of non-medical influences in clinical decision-making such as attributes of patients, characteristics of physicians, and the context of the clinical encounter, which had not been factored in to idealized, rational decision-making models.²³

Physicians’ affective reactions to uncertainty have been defined as (a) the emotional reactions and concerns engendered in physicians who face clinical situations that are unfamiliar or not easily resolved and (b) the behaviors used by physicians to cope with

those emotions and concerns.²⁴ Studies on physicians' affective reactions to uncertainty are limited. However, affective reactions may be important because judgment and decision making may be influenced by the subjective experience that accompanies the reasoning process.^{25,26}

Early studies of the affective experience of uncertainty in physicians have come from the sociological literature. Over 50 years ago, Fox noted, "Despite unprecedented scientific advances, the life of the modern physician is still full of uncertainty." In her 1957 study of medical students, she identified three kinds of uncertainty: uncertainty arising from incomplete mastery of medical knowledge and skills, uncertainty due to the limitations and ambiguities of that knowledge and those skills, and the uncertainties of distinguishing between these two. A common reaction to the uncertainty was a sense of personal inadequacy. Fox concluded that every doctor must constantly cope with these forms of uncertainty.²⁷ Light expanded upon these sources of uncertainty to include those arising from problems of diagnosis or analysis, treatment of those problems, and responses from patients.²⁸ Beresford further categorized three sources of uncertainty in medical practice: technical, arising from inadequate scientific knowledge to predict prognosis or effect of interventions; personal, arising from the patient-physician relationship such as not knowing the patient's values and concerns; and conceptual, arising from the problem of applying abstract criteria to concrete situations.²⁹

In coping with this uncertainty, physicians engage in "occupational rituals," which have been defined as the social practices that assist physicians in managing the experience of uncertainty. According to Bosk, clinical reasoning involves not only information-processing, but also a social aspect. Because difficulties in making a diagnosis and prescribing treatment are shared by all physicians, occupational practices and cultural patterns have evolved amongst physicians for sharing the burden of problematic decision-making. Bosk describes eight key strategies used by physicians to manage

uncertainty: hedged assertions (“deliberately fuzzy communication”), probability reasoning (creation of a differential diagnosis which allows acknowledgement of diagnostic uncertainty), a focus on uncertainty as a research problem, gallows humor and hyperrealism (a mixture of detachment, resignation, helplessness, anger, and realism in humor), deciding not to decide, consultation with colleagues, and Socratic teaching. Deciding not to decide refers to the adopting of a wait-and-see-attitude in the hope that the problem will heal itself. Seeking the advice of colleagues or specialists may help to mitigate the feeling of uncertainty by removing personal stigma from uncertainty in that if a trusted consultant cannot provide an answer, no one can; furthermore, this transfers some of the responsibility of the problem to the consultant. Socratic teaching refers to questioning the value of information that is obtainable and needing to come to some kind of a decision regardless, accepting that one must learn to live with a degree of uncertainty.³⁰

Others have written of physicians' disregard of uncertainty as a means of remaining in control over their internal and external worlds. Denial of awareness of uncertainty makes matters seem clearer, more understandable, and more certain than they are, so that action is possible. Katz writes that donning a “mask of infallibility” is one way of maintaining professional control. However, “[m]asks can deceive not only the audience but the actor as well. The mask of infallibility makes it more difficult than it otherwise would be for physicians to explore their own doubts and uncertainties, and precludes acknowledging them to patients.”³¹ Similarly, Hall suggests that the denial of uncertainty may provide a psychological protective mechanism in making decision-making easier through the illusion of control and mastery.³² Atkinson describes certainty and uncertainty as not being mutually exclusive; instead, these may be two modes or attitudes towards knowledge and action. Medical knowledge and practice are inherently uncertain, while the “certainty” of dogmatism and personal judgment are the clinician’s response to that uncertainty.³³

Thus, descriptions in the literature of physician response to uncertainty include feelings of inadequacy, denial of uncertainty, and “occupational rituals” involving cultural practices which can influence the decision-making process. These may be particularly relevant in primary care medicine which is characterized by high degree of uncertainty and time pressures in which decisions need to be made. Although not well-studied, reflection-in-practice may be an important mechanism for ensuring effective and safe clinical decision-making under these circumstances.¹⁰ A review of the literature on reflective practice and more thorough definitions of terms are provided below.

1.3 REFLECTIVE PRACTICE

In 1983, Schön wrote, “In the varied topography of professional practice, there is a high, hard ground where practitioners can make effective use of research-based theory and technique, and there is a swampy lowland where situations are confusing “messes” incapable of technical solution.”⁹ According to Schön, knowledge in these indeterminate zones of professional practice is inadequately described in terms of technical rationality; there is a complementary role of professional artistry involving reflection-in-practice that allows the professional to frame or reframe difficult or complex problems.³⁴ The process of reflection-in-practice has been described as an important mechanism for ensuring safe and effective performance in medical practice, and this may be particularly applicable to practitioners in the “swampy lowland” of primary care medicine, where diagnosis is often unclear and ability to manage uncertainty is paramount. Thus, this thesis study adopts a reflective practice framework in studying the experience of uncertainty among primary care practitioners. A strength of this framework is that reflective practice has been demonstrated among primary care physicians in clinical practice^{35,36}; a limitation is that research literature is largely exploratory and has not addressed outcomes of reflective practice or its effect upon professional practice beyond self-report.

Reflection has been defined as “intentional mental processing, used primarily with complicated or uncertain situations or ideas in order to fulfill a particular purpose in the present or future.”³⁷

Originally, the concept of reflection was described by Dewey and Kolb in the context of learning from experience. Reflection was focused mainly on past events and its purpose was to learn from past experience in order to improve future problem solving and decision-making. Schön introduced the concept of reflection occurring during current and ongoing actions which could be used to improve the quality of those actions through on-the-spot decisions or decisions made shortly after reflection.³⁸

Many forms and functions of reflection have subsequently been distinguished in the literature. These include learning from experience^{34,39}, critical learning^{40,41} and mindful practice.⁴² Aukes et al. distinguished three cognitive-emotional levels of the physician as a reflective practitioner:⁴³ (i) clinical reasoning - focusing on problem-solving, judgment, and decision-making, involving Schön’s concept of reflection-in-action; (ii) scientific reflection - including critical appraisal of literature and reflection upon one’s own practice outcomes to learn from that experience, involving Schön’s concept of reflection-on-action; and (iii) “reflection-on-experience” - a personal reflection on experience which maintains and optimizes balanced professionalism in practice, with reflective attention being focused on sense-making in medical practice and the dynamics of rational and irrational thoughts and emotions, assumptions, and beliefs in that process. Similarly, other models of reflection have been described in the literature that incorporate a vertical dimension of different levels of reflection on experience, with surface levels generally being less analytical than deeper levels which involve critical reflection, making meaning, and transformative learning.

A recent extensive systematic review of the literature on reflective practice in the health professions suggests that reflection fulfills several functions, including helping to make

meaning of complex situations and facilitating learning from experience. The review concluded that reflection tends to be stimulated by complex clinical problems, occurring on or during experience as well as in anticipation of challenging situations, and reflective ability and tendency varies across individuals and appears to be multi-factorial.¹²

1.3.1 Reflection-On-Action

In most models of reflective practice described in the literature, reflection is depicted as a returning to an experience to examine it, with the intent of incorporating what is learned into one's existing knowledge base for the purposes of guiding future situations.

¹² Schön refers to this process of thoughtful analysis as reflection-on-action.^{44(p 74)}

1.3.2 Reflection-In-Action

Reflection-in-action refers to the act of considering whether or not the situation and one's role in it are progressing according to expectations. Schön describes reflection-in-action as thinking about something while doing it and making on-the-spot adjustments accordingly, the process used by practitioners to cope with the troublesome "divergent" situations of practice. Reflection-in-action hinges on the experience of surprise. The reflection focuses interactively on the outcomes of action, the action itself, and the intuitive knowing implicit in the action, and it is bounded in time by the "action-present" (the zone in time in which the action can still make a difference to the situation.)^{44(pp 74-75)}

1.3.3 Reflection-In-Practice

Schon refers to reflection-in-practice as a particular kind of reflection-in-action which occurs in professional practice. Although professional practice involves a range of cases that need to be managed, there is some element of repetition and a tendency for the practitioner to become less reflective with increasing experience. The professional becomes less subject to surprise; the knowing-in-practice tends to become increasingly tacit, spontaneous, and automatic. However, with increasing proficiency, there can be negative effects such as narrowness of vision and missed important opportunities to think about patterns of error that may continue uncorrected. Schön believes a practitioner's reflection-in-practice can serve to correct this over-learning.^{44 (pp 72-73)}

Similarly, Mamede has used the term "reflective reasoning" to represent the reflective act that occurs during diagnostic reasoning processes. Physicians' ability to critically reflect on their own reasoning has been considered crucial for optimal clinical performance.⁴⁵

Thus, reflection-in-practice refers to the act of considering during professional practice whether or not the situation one is encountering is progressing according to expectation. In medical practice, reflecting-in-practice can lead to an awareness of the feeling of not knowing and the need to obtain more information to make a good clinical decision regarding a particular patient. This process may prompt the physician to access information from an external source to help with clinical decision making. However, the physician's ability to accurately reflect on decision-making requires some degree of awareness of the influences on one's own judgment as well as the capacity for self-assessment.

1.3.4 Self-Awareness

Self-awareness involves a recognition of situations that increase the risk of errors (such as denial, fatigue, or distraction), attending to previously unexamined decision rules that are being applied to the situation, and then seeking to reframe and revise the understanding of the situation.^{46,47} This process of self-awareness has been referred to as “mindfulness,” defined by Epstein as a purposeful, non-anxious, reflective presence that can be applied to the cognitive, technical, and interpersonal aspects of medicine. The mindful practitioner attends to his or her physical and mental processes during tasks, is able to listen more attentively, and becomes more aware of his or her own biases and judgments resulting in greater flexibility and ability to act with clarity and insight.⁴²

Yet there are likely limits to one’s capacity for self-awareness. Wilson writes of the adaptive unconscious as mental processes that are inaccessible to consciousness but which influence judgments, feelings, or behavior in a way which protects one’s psychological sense of well-being.^{48(p 23)} These processes may lead to the unconscious interpretation of events in the best light for maintaining ones’ self-perceptions.

1.3.5 Self-Assessment

As a generic skill, physicians’ capacity for accurate self-assessment of performance appears to be poor.⁴⁹ Confidence in one’s ability to make good clinical judgments may merely represent an unawareness of repeated mistakes; as Redelmeier et al. write, “bad judgment, like bad breath, is often not noticed by its source.”⁵⁰ Indeed, literature suggests little relationship between actual performance or ability and self-rated performance or ability. General practitioners appear unable to accurately assess their own level of knowledge on a given medical topic.⁵¹ With the exception of the highest

performers who tend to underestimate their abilities, most individuals overestimate their level of performance, particularly those in the lowest quartile of performance, and the ability to self-assess appears to be domain-specific.^{52,53,54} It appears that self-assessment capacity varies by content, context, and perspectives. Limited studies have suggested that exposure to benchmark performances may lead to more accurate self-assessments,⁵⁵ but such improvements have not been shown to increase self-assessment “skill” beyond the scope of those performances.

However, as Eva and Regehr argue, these limitations may not impact upon one’s capacity to recognize the limits of one’s competency in the moment and to know when to access help. Indeed, while the capacity for self-assessment (as a judgment of one’s ability) is poor, the capacity for in-the-moment awareness (i.e., moment-by-moment judgments of accuracy) has been demonstrated as individuals appear quite good at knowing when they are likely to make an error and when to slow down as a result.⁵⁶

This reflection-in-practice process may be an important mechanism for ensuring safe clinical decision-making. It allows the physician to recognize whether or not the situation encountered is proceeding according to expectation, when the physician is at the borders of competency, and when to stop and access help with decision-making.

Despite its importance, the concept of reflection-in-practice has only recently been described and knowledge of this process and its influences in medical practice remains limited.¹⁰ Further research is, therefore, required to better our understanding of the reflection-in-practice process and its relationship to safe and effective clinical decision-making.

1.4 SUMMARY

In summary, primary care medicine is characterized by its broad scope of work with high degree of uncertainty and time pressures in which decisions need to be made. Limited studies have suggested variations in physicians' responses to uncertainty that may influence clinical decision-making. Reflection-in-practice refers to the act of considering during practice whether or not the situation one is encountering is progressing according to expectation. In medical practice, reflection-in-practice may be an important mechanism which leads the physician to an awareness of the feeling of not knowing – a recognition that one's limits have been reached – and the need to “stop and think” or look to external resources in the moment of action in order to make a good clinical decision regarding a particular patient. The capacity for in-the-moment awareness has been demonstrated. Reflecting-in-practice may, therefore, be a mechanism that can ensure effective and safe clinical decision-making but to date this process, its influences, and its effect on physician practice behavior have not been well studied. Determining the circumstances in which this occurs in an actual practice setting, as well as the external resources that primary care physicians are likely to access under these circumstances, may provide greater understanding of this important process and create implications for clinical decision-making and, ultimately, patient safety.

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CHAPTER 2

SITUATIONAL CUES THAT PROMPT USE OF EXTERNAL RESOURCES BY COMMUNITY FAMILY PHYSICIANS: A QUALITATIVE STUDY

2.1 INTRODUCTION

Many forms and functions of reflective practice have been described in the literature and are summarized in Chapter 1. In medical practice, reflection-in-practice may be an important mechanism for ensuring effective and safe clinical decision-making.¹ Reflecting-in-practice can lead to an awareness of the need to “stop and think” or “know when to look it up” and access external resources in the moment of action in order to make a good clinical decision.² Studies under experimental conditions have associated physicians’ perceptions of a case being problematic, such as cases involving increased complexity or ambiguity of the presenting problem, with a switch from automatic to reflective reasoning processes.^{3,4} However, studies of reflection-in-action as it actually occurs amongst practicing physicians are limited. Various authors have described the importance of a naturalistic approach to studying clinical decision-making, involving real-world situations which impose demands such as time pressures, fatigue and stress on the physicians’ decision-making processes.^{5,6,7,8} Such influences may not be adequately captured in laboratory-based decision-making research. Studying reflection-in-practice as it occurs in a real practice setting may provide additional information about the circumstances associated with physicians’ perceptions of a case being problematic, these being the types of cases that have prompted physicians to switch from automatic to reflective reasoning processes under experimental conditions.^{3,4}

As well, there are limited studies on the effect of reflective practice on physician behavior. A recent extensive systematic review of the literature on reflection and reflective practice suggests that reflection is demonstrated amongst practicing health professionals, yet none of the studies addressed outcomes of reflective practice and its effect on these professionals or their behaviors.⁹ Therefore, a study of the cues

influencing the reflection-in-action process and prompting physicians to access help from an external resource may provide valuable additional information on clinical decision-making which is relevant to patient safety, as well as contributing to a greater understanding of the psychosocial influences involved in physician-patient encounters.

The ability of physicians to report on the reflection-in-practice process implies an ability to critically reflect on the decisions being made and some capacity for self-awareness and self-assessment. Yet, literature suggests that as a generic skill, the capacity for self-assessment of performance may be limited.^{10,11,12,13,14} In protecting one's psychological sense of well-being, unconscious mental processes may influence interpretation of information and judgment.^{15(p23)} As well, much of clinical reasoning may involve unconscious non-analytic processes which include heuristics and biases that can affect judgment, decision-making and rationality.^{16(p 220),17,18,19,20,21} Thus, physicians may be limited in their awareness of the factors influencing their own judgment and behaviors and in their accuracy of self-assessed performance.

However, Eva and Regehr make the important distinction between the capacity for situation-specific self-awareness (moment-by-moment judgments of accuracy) and the capacity for self-assessment (a judgment of one's ability). While literature convincingly suggests that the capacity for self-assessment of performance is poor, Eva and Regehr have demonstrated that individuals have capacity for in-the-moment self-awareness (i.e., people appear to generally know when they are operating at the limits of their competence).²² Thus, it is important to understand what moment-by-moment cues prompt individuals to seek assistance from external sources.

A study of the actual situational circumstances associated with this in-the-moment awareness of being at one's limits of competence could provide valuable additional information about common cues which cause the physician to "stop and think" and recognize a need for external help in decision-making. The decision to access an external

resource is a concrete behavioral indicator that the reflection-in-practice process occurred and that the physician recognized a feeling of uncertainty. Knowledge of these cues may provide understanding of situations of clinical uncertainty that seem most troublesome for physicians and influences on their choice of external resource in those circumstances. This information may assist in planning for better access to those types of resources with the aim of facilitating safe and efficient clinical decision-making under problematic circumstances.

Thus, this qualitative study was designed to explore the situational cues associated with the reflection-in-practice processes that prompt physicians to access an external resource. A naturalistic approach ^{6(p 741)} was used in an actual primary care setting in order to incorporate the dynamic medical and non-medical factors which influence clinical decision making in primary care clinical work.^{23,24} This is consistent with the recognition of the importance of studying naturalistic decision making in other fields.²⁵ Because the capacity for in-the-moment awareness has been demonstrated, information will be collected at the point of making the decision to access an external resource as this would methodologically increase the accuracy of information obtained, as compared to collecting generic impressions of the encounter retrospectively which would place more demands on the participant's memory.

2.2 OBJECTIVES

Using a naturalistic approach, this qualitative study attempts to identify the common situational cues that prompt the family physician to act on the feeling of uncertainty by accessing information from external resources.

2.3 METHODS

2.3.1 Setting

Kitchener-Waterloo, Ontario, is an urban community with a population of 290,000 and 158 family physicians. Cambridge, Ontario, is a neighboring urban community with a population of 120,000 and 72 family physicians.

2.3.2 Sample

The study involved 6 male and 6 female family physicians, 11 practicing in Kitchener-Waterloo and 1 practicing in Cambridge. 11 participants were in group practice and 1 practiced solo. Experience ranged from 2 to 21 years of practice; mean years in practice was 14. Given the degree of effort and time asked of the physicians who agreed to participate during their patient care clinics without compensation, convenience sampling was used. To improve the likelihood that this sample was representative of the population of community family physicians, equal numbers of male and female physicians were obtained with a range of practice experience. All participants were practicing community family physicians; 8 physicians had academic affiliations with a Family Medicine residency teaching program and 4 did not.

As data were collected, transcripts were reviewed periodically by 3 individuals to identify themes. These individuals included a practicing family physician, a researcher with a background in cognitive psychology, and a researcher with a background in social psychology. Sample size was determined when thematic saturation was achieved.²⁶

2.3.3 Data Collection

Data were obtained from each participant through self-observational journaling. Participants were asked to verbally record on hand-held Dictaphones a descriptive account of the circumstances in which they became aware of the need to get more

information from an external source to make a good clinical decision regarding a particular patient. It was requested that this be done immediately after the patient encounter, if possible, on 6 sequential patient encounters in which a decision to use an external resource occurred. Each participant was provided the following instructions:

For the next 6 patient encounters in which you utilize an external source of knowledge in helping to make a clinical decision (e.g., electronic or book reference, referral because the diagnosis was unclear, obtained the opinion of a colleague, etc.), please comment on the following as soon as possible after the encounter:

(i) Description of circumstances

Leaving out identifying patient information, describe the circumstances at the time in which you felt the need to use an external source of information.

- What aspect(s) of the patient's case provided the source of your uncertainty?
- Was there anything unusual about this case that led you to use an external resource (i.e., can you identify feelings, patient-related factors, or observations that might have made you feel less certain in this case)?
- Was there anything unusual about your own background with this type of case that led you to use an external resource (i.e., can you identify personal factors that might have made you feel less certain in this case)?
- Were there environmental circumstances that influenced your decision to use external sources of information in this case? (e.g., How serious did you perceive this case to be? How much pressure were you feeling in your practice at this moment? How important is the answer to you? Did other persons attend this visit? If so, please identify their relation to the patient.)

(ii) Nature of resource(s) used

- What external resource(s) did you use? (Please be specific – book title, internet site, specialty of consultant referred to, etc. If several resources were used, please list the order in which they were accessed.)

(iii) Influence of the resource on decision-making

- What information were you seeking?
- Are there other resources you would have liked to have used/considered using, but didn't? If so, why?
- Did utilizing the resource(s) affect your clinical decision?
- How important was it that you utilized external resources rather than pressing on without them? (i.e., In hindsight, was it necessary to use those resources?)

When comments on all 6 encounters are complete, please dictate the following (to be transcribed separately from the above data to ensure anonymity):

- How many patients in total did you see from the first to sixth patient encounter identified for this study?
- How many clinical sessions did it require to collect 6 responses?
- How many years have you been in practice?
- Group or solo practice?
- Gender?

2.3.4 Data Analysis

The data were transcribed verbatim by a third party and reviewed by the researchers only after transcription to ensure anonymity. Participants were told this would be the process, in order to increase the likelihood that they would present honest accounts of their experiences. The transcribed data were reviewed independently by the three individuals, described above, each of whom used the data to identify key ideas and recurrent themes. Utilizing aspects of a grounded theory approach^{26,27(p 29)}, results were compared and organized and re-organized in an iterative process to identify index themes and categories as they emerged from the data.

Based on these results, a detailed coding framework was developed by which data could be systematically indexed. This framework included the following broad conceptual categories: specific aspects of the case; identified emotions and feelings of the physician, patient, or person accompanying the patient; “face”(identified need to appear competent or confident as a physician); reason for accessing or not accessing an external resource, type of external resource accessed and how that access influenced clinical decision-making; self-awareness of influences on clinical decision-making; specific aspects of uncertainty identified by the physician; “want” (identified motivators); and other factors identified as influencing clinical decision-making. Each broad category was further divided into sub-categories. For example, the category of “want” included sub-categories of wanting verification, confirmation, or greater comfort with decision being made; wanting to ensure medical liability was met; wanting patient satisfaction; wanting personal satisfaction; wanting the patient’s trust; and wanting credibility in the presence of a learner.

In establishing analytic categories, all data relevant to each category were checked and compared with the rest of the data. QSR NVivo 8 software was used to facilitate the process of coding and retrieval and the cross indexing of sections of data with multiple themes. To ensure appropriateness of structure for analysis, an iterative process of

testing and retesting of concepts was performed, applying the developed framework onto new data and modifying accordingly to ensure that the established themes were relevant and comprehensive.

2.4 FINDINGS

This study provides information on the situational circumstances associated with physicians seeking external help in decision-making in response to clinical uncertainty in a primary care practice setting. Several important themes were identified, as shown in the sections discussed below. Most prominently, specific features of the patient encounters cued physicians to stop and think and access external sources for help. These included not only medical aspects of the case such as unusual or complex presentations or potentially serious conditions, but also social aspects of the case, particularly the physician's perception that the patient or family member was anxious, demanding or mistrustful. To some extent, factors specific to the physicians themselves also acted as cues. These included self-identified gaps in personal knowledge or a personal need for greater certainty. Choice of external resource was influenced by ease and efficiency of obtaining the required information and credibility of the source; this was particularly relevant to physicians in Family Health Team who decided to refer to inter-professional health care providers. The decision to refer to specialists was influenced not only by the medical appropriateness of the referral, but by the level of comfort with the relationship with that specialist. Access to external resources appeared to be a complicated and variable influence on the physician-patient relationship: for some, obtaining accurate information was important in maintaining patient trust and satisfaction with care; for others, accessing information contributed to a sense of appearing more knowledgeable in front of the patient.

The following elaborates on important themes identified in this study, illustrated by quotes obtained from the transcription data.

1. Cues that prompted physicians to seek external information rather than relying on their personal knowledge base included both medical and social aspects of the case.

Medical aspects of the case included unusual or complex presentations, potentially serious conditions, and failure of previous treatment attempts.

Unusual case presentations were generally noted by the presence of atypical features and difficulty obtaining a clear diagnosis.

- *“So, it was just the unusual features of this rash that did not fall into a typical pattern that we usually see and that is what made me feel that I would like some extra information on this” [Dr. I]*
- *“It was unusual in the sense that it was a papular rash with inflammation, and I wasn’t quite sure in the sense of it looked like it could certainly have been molluscum contagiosum except that it was quite coalesced as well as inflamed. In this case I called in [a colleague] to have a look who also agreed that it was not the usual presentation for any rash that he has seen before” [Dr. D]*
- *“She had this widespread, painful, itching dermatitis over her trunk, arms and legs. By the time I saw her, she had already been seen in an Emergency Dept. and a Walk-In Clinic and had had various treatments prescribed by physicians in both of these locations, with no benefit...So I ordered some blood tests and made a referral to a dermatologist just because I was feeling that there was more to this rash than met the eye” [Dr. I]*

More complex clinical cases often prompted the physician’s use of external resources. Physicians described various aspects that contributed to complexity of care, often oriented around co-morbidity, psychological factors, or drug interactions.

- *“The unusual thing about this patient is that she has a number of fairly significant health problems and she is on a long list of medications, so I felt I needed to be very careful about not causing an untoward medication reaction” [Dr. I]*
- *“The aspect of this case is that knowing that he is a diabetic patient and if we added the fibrate then he would be on multiple medications to control his cholesterol levels. I felt that this would increase his risk of myopathy. Having said that I was concerned in wanting to have good risk factor reduction given his status of being a patient with diabetes” [Dr. K]*
- *“This patient has been a challenging patient. She lives on the street. She has had a recent diagnosis of Hepatitis C. She suffers from substance abuse including intravenous drug use...this patient has a personality disorder and suffers from substance abuse which makes her hard to deal with. She is sometimes very temperamental...The information I was seeking was not so much what to do, but how to deal with this challenging patient...We decided in the end just to re-refer this patient” [Dr. A]*
- *“This case involved considering a situation that was uncertain in regards to whether there was any neglect or child abuse going on. Because of the medical legal implications I needed more certainty in terms of what to do” [Dr. C]*

Patients' failure to improve as expected with treatment often prompted physicians to access external resources.

- *“She has had ongoing pain issues...The uncertainty was really on how to manage this as she has been tried on medication, physiotherapy, chiropractic treatment and massage” [Dr. A]*

- *“I have done everything I can think of over the past several years to assist with this constipation so I therefore have referred her to a gastroenterologist... I have worked on this issue with this patient for many, many years and I feel it is time that we had a gastroenterologist involved in the situation” [Dr. H]*

Physicians accessed external resources when there was concern about potentially serious conditions. These included conditions such as testicular torsion (Dr. B), corneal lesions (Dr. B), coagulation disorders (Dr. I), vasculitis (Dr. I), melanoma (Dr. J), hyperkalemia (Dr. J), severe hypertension (Dr. J), kernicterus (Dr. K), angina (Dr. F and Dr. J), pediatric hypertension (Dr. H), and child abuse (Dr. C).

In several cases, the physician described a general sense of patient unwellness which suggested a potentially serious underlying condition. In these cases, physicians described urgent need for access to external resources, usually in the form specialist consultation and referral.

- *“I however was concerned that she did just not look quite right. She was certainly not toxic by appearance or on exam, but she did look clinically unwell...I felt that this was an unusual presentation but clearly this child seemed ill, elevated white count with a lot of neutrophil, suggested bacterial infection, but I could not find one...I consulted with the on call pediatrician” [Dr. L]*
- *“This patient presented with rapid onset of neurologic symptoms and problems with his cognitive functioning. I was uncertain of the diagnosis and given this patient’s young age and lack of other risk factors and family history and the rapid onset of his symptoms, I looked to get further information on this...circumstances that influenced my decision included the serious nature of the case” [Dr. C]*

In other cases, physicians identified specific presenting features which acted as cues that a more serious condition needed to be ruled out.

- *“Anytime that a person has photophobia I am concerned about something more corneal”* [Dr. B]
- *“The family history of melanoma raised a red flag. My feeling was that I didn’t want to miss anything”* [Dr. J]

Degree of patient suffering also influenced the decision for referral.

- *“Upon examination, his entire body below the neck is red and flaking with no obvious papules. Simply unsure about what is going on here and what should be used...he seemed to be in enough agony that I felt he warranted being seen very quickly”* [Dr. K]
- *“The pain was very distressing to her. Certainly the feeling was of empathy towards her pain and how she was describing how much suffering it was causing. She had tried simple medications like Tylenol Arthritis without success. Upon further thought it was decided to refer her to a Rheumatologist”* [Dr. A]

Social aspects of the case played a considerable role in physicians deciding to access external resources. Social pressures were particularly noted when the patient or others attending with the patient were perceived as being anxious, demanding, or mistrustful.

Patients were described as being anxious about various aspects of care. This included patient concerns about the diagnosis, patient desire for further investigations to establish the diagnosis, and the patient desire for a referral.

- *“She was worried that it could be night sweats from her Melanoma; she was worried about a recurrence. I was feeling pressure from the patient as she can be quite anxious” [Dr. E]*
- *“A 35 year old woman with a history of chronic constipation who has a friend of a similar age who has been diagnosed with metastatic cancer of the colon and is therefore extremely anxious about her chronic constipation” [Dr. H]*
- *“He was requesting multiple types of blood work looking for systemic Chlamydia...This patient was quite persistent in feeling that he absolutely needed these multiple serologic tests” [Dr. C]*
- *“I did not feel that this was serious case and the patient was feeling that this was urgent and requested a same day appointment and did not seem to be reassured and did really press for a specialist appointment” [Dr. J]*

Anxiety of persons accompanying the patient had a similar effect.

- *“The pressure and the seriousness of the case were compounded by the concern I felt from the patient’s son” [Dr. J]*
- *“The mother was quite frantic about her daughter’s behaviour...[she] was quite anxious and worried about her daughter and looking for some support” [Dr. I]*

There were two identified mechanisms by which the anxiety of the patient or accompanying individual influenced the physician’s need to access external resources: a desire to please or a desire to defend.

In some cases, physicians described a greater need to foster patient trust and satisfaction with care, with access to external resources providing a means of alleviating patient anxiety. This was particularly noted as a reason for accessing specialists' consultation, either by telephone discussion between the family physician and specialist or actual referral of the patient to a specialist. Access to internet sources was sometimes used to reinforce the physician's recommendations.

- *"When I spoke with the patient I knew that she would be anxious, and I was able to explain to her the suggestions from the gynecologist so it was very helpful to say that I had spoken with somebody who was a specialist in the area, which increased the level of credibility, and the patient's comfort" [Dr. G]*
- *"The patient is worried about appendicitis but there is nothing to suggest this...I felt that sending her to a gastroenterologist might make her feel a little bit more secure" [Dr. B]*
- *"I went on the internet to find information and pictures to show the mother to reinforce the clinical diagnosis. I also went online to provide a handout to the patient's mother and to review options for treatment...It didn't really affect my decision making but it did help give the patient and my student information [and] helped to show the parents pictures and helped confirm the diagnosis and plan of treatment" [Dr. E]*

In other cases involving anxiety of the patient or accompanying individual, physicians described a greater need to defend his or her own actions and decision-making.

- *"This patient is a very anxious demanding patient so that certainly influenced my decision to look things up and be very thorough and to make sure I know what I am talking about before I see him back" [Dr. E]*

- *“This patient’s physical examination was unimpressive, but the aspect of the patient’s case was her own concern and anxiety that she did feel that there was something in her left eye. Patient related factors were just a very anxious patient personality which made me feel a little uncertain about my own diagnosis which would have been a little bit of reassurance and possibly a little irritant conjunctivitis” [Dr. J]*
- *“I would say the mother was quite pushy and I felt uncomfortable and wanted to be secure in my knowledge” [Dr. E]*

Similarly, a sense of patient mistrust influenced the need to access external resources by generating a greater need for the physician to defend his or her decision-making.

- *“The patient feels that I missed her Melanoma, so that in turn puts extra pressure to be certain about making any clinical decisions. I feel that the patient doesn’t fully trust me and therefore I think that is what increases my angst about making correct decisions about her care” [Dr. E]*
- *“Certainly in my experience with this particular patient, she has had some medical events that have made her quite distrustful of the medical system and so on and probably more likely to refer her sooner rather than later, even though medically I not concerned that there is something sinister going on” [Dr. H]*

The presence of learners was mentioned as a factor influencing a need for greater accuracy and certainty.

- *“Because I was in a teaching role, I felt it was important that the information that I was sharing was accurate and so I felt that I needed to be a little more certain than I would normally” [Dr. G]*

- *“How important was it that I use the external resource rather than pressing on? It was helpful because it gave me more surety that I was handling the case properly in particular that I was imparting the correct information to the resident” [Dr. G]*

2. Factors specific to the physicians themselves also acted as cues. These included self-identified gaps in personal knowledge or experience or a personal need for greater certainty.

Frequently, physicians cited a gap in personal knowledge which prompted them to access external resources. Identified areas of knowledge deficiency ranged from general domains in practice involving the diagnosis and management of a particular illness, to knowledge of specific drugs as they related to particular patients.

- *“I am particularly weak in Rheumatologic diseases and I am aware of that and therefore I looked it up on the internet and ended up looking at my Toronto Notes and eMedicine. The personal factors that made me seek an external resource, just that I know I am bad with Rheumatology” [Dr. E]*
- *“Generally, skin rashes are very easy to diagnose, but in this case, I am just totally unsure what is going on” [Dr. K]*
- *“He had been to several specialists about the back problem, but it hasn’t been fixed...Everything was getting worse. Basically the man just dumped everything back in my lap and I felt, I don’t know what to do here, I don’t know how to manage it” [Dr. F]*

- *“I am new to Travel Medicine and don’t have the depth of knowledge sometimes for certain areas of the world in terms of malaria risk. I try to be fairly honest with myself with what I know and don’t know, and I felt uncomfortable evaluating the risk of malaria without help” [Dr. E]*
- *“The patient came to see me to ask whether it was safe for her to take ASA with Methotrexate. I wasn’t sure about that. I wasn’t sure about the drug interactions so it was specifically drug interaction that I was seeking information about” [Dr. I]*

While the predominance of cues named were knowledge-based gaps, a few physicians noted deficiency in a particular practice skill or experience which resulted in referral of the patient.

- *“I do know that I don’t have the skill or time to provide cognitive behavioural therapies to my own patients on an ongoing basis... I don’t end up doing a very good job with cognitive behavioural therapy in the times that I have worked at it.” [Dr. H]*
- *“I saw a patient today with prostatic dysuria...I did not know anything about this condition....I have never seen a patient with this condition and that is what created the uncertainty” [Dr. E]*
- *“The case brought up uncertainty to me in terms of what this mass may represent. This is another instance of something that I have never encountered before and some compounded difficulty as I could not visualize this mass...My gut instinct was that this was likely a benign mass but again was something that I had never encountered before and was of considerable size to warrant some level of concern from me and want to get the specialist’s opinion” [Dr. L]*

Some physicians described a personal importance of feeling more certain.

- *"In many cases I think it was easing my own concerns as opposed to the patients who seem quite fine with that approach" [Dr. L]*
- *"I am a type A personality, so I always want to be precise and correct, up to date and evidence based when I give information to patients" [Dr. E]*
- *"The answer was very important as by getting the correct information, I could reassure myself that I wasn't missing anything" [Dr. G]*
- *"I didn't think that the case was all that serious; it is more an internal pressure, not an external pressure...The answer is important to me because I always want to provide the best patient care possible" [Dr. E]*

3. External resources often acted as an opportunity for verification of the diagnosis or management plans and was especially noted in cases which might represent a serious condition or one that could have potentially serious consequences associated with incorrect diagnosis or management.

Physicians frequently described a sense of knowing the answer but wanting reassurance from an external resource.

- *"I had an idea of what it might be but wanted to confirm what it was so I went and looked in a dermatology book" [Dr. A]*

- *“With the help of these resources I was able to “back up” my gut feeling that I should not be prescribing this medication for M.S... In this case, using external resources helped to validate my own initial decision making” [Dr. C]*
- *“By seeking some more information, I felt more comfortable in reassuring the patient. It didn’t affect my clinical decision making, it just helped support my inclination with this particular patient” [Dr. E]*

With potentially serious conditions in particular, several physicians described concerns about accuracy of answers and the consequences of incorrect diagnoses and mismanagement.

- *“The question was about something that was quite substantial and potentially very serious and therefore something that I wanted to ensure that I had the correct answer” [Dr. G]*
- *“In this case it was necessary to use an external resource since if I had made a wrong decision I could have been held liable for not reporting a possible situation of child abuse or neglect” [Dr. C]*
- *“I didn’t want to miss anything potentially serious and that I thought the risk of not referring was that we could miss a cancer that was too serious to ignore” [Dr. J]*
- *“The information that I was seeking was to sort out what the source of her infection may be, and to know what to treat. This was important to me because otherwise I felt I would be blindly treating an infection that I did not know what it was and possibly treating it incorrectly and having the condition become worse” [Dr. L]*

Many physicians reported feeling more reassured with their decisions after accessing the external resource.

- *"So, I went on the internet and just looked at pictures of erythema migrans...this was just to inform myself of what the rash actually looked like... Did it affect my clinical decision? No, I would not have treated her for Lyme Disease on the spot without this, but it was very helpful" [Dr. I]*
- *"If I did not access additional resources, I do not think that I would have been as comfortable in the advice that I was able to give. I don't think that I could have been as reassuring as I think the outcome was" [Dr. G]*
- *"Utilizing the resources did affect my clinical decision in the sense that it confirmed it, and talking to the pharmacist made me happy that I was not missing a medication culprit" [Dr. J]*
- *"Speaking with [the obstetrician] did help in my clinical decision making so as not to do any further tests as well as easing my own mind and I think also the patient's" [Dr. L]*

When physicians were able to obtain the information required from the external resource, they sometimes described a change in their decision-making. This involved various aspects of patient care especially regarding medications prescribed and investigations ordered, and even the need to access additional external resources to make a good decision.

- *"I looked in the CPS, the 2008, and got the latest information and found that it was an amphetamine salt and I had never prescribed it and I thought that there*

were some bad things associated with it and I was a bit uncomfortable...So in fact, I went back in to the mother and the young man and just talked to them and said I wasn't really comfortable prescribing the Adderall" [Dr. F]

- *"Utilizing the resources did help in terms of getting suggestions for medical management and further investigations. In this case it was absolutely necessary to use external resources rather than groping in the dark for answers" [Dr. C]*
- *"I was satisfied with the resources I used. Definitely the resource I used affected my decision; it helped me make decisions as to what blood work to arrange. Yes, it was necessary to use those" [Dr. E]*
- *"I was glad to have utilized this source because the management was different to what I would have had on my own and that if anything I would have started the patient on some outpatient oral antibiotics as opposed to treating her with intravenous antibiotics" [Dr. L]*
- *"The information sought was in regards to where this patient ought to be referred and the external resource accessed was a colleague's opinion. After discussion and thinking about it, it was decided to defer the referral" [Dr. A]*
- *"Certainly utilizing this resource has helped in that I am not sending this patient needlessly to the emergency department" [Dr. K]*

4. A variety of influences were described as affecting the choice of external resource accessed. Ease of access, efficiency of obtaining the required information, and credibility of the source were cited as important factors. For family physicians practicing in Family Health Teams, availability and ease of access to interprofessional health care providers seemed to influence the decision to use that resource.

- *"I could have used online sources but didn't because the dermatology book was handy and present" [Dr. A]*
- *"I love having internet access because I am able to get immediate information which directly impacts my practice and makes it very time effective and evidence based to find out information for patients at that time" [Dr. E]*
- *"I did not go to a text, I think primarily for time and convenience reasons. I was able to simply walk down the hall and speak to someone who was very up to date on the literature" [Dr. L, referring to the Family Health Team clinical pharmacist]*

Similarly, when a decision to refer to a specialist was made, ease of access was an important consideration in the choice of specialist.

- *"We are sending the patient to [a dermatologist] in Guelph. The reason for choosing that is because Dermatology is not as easily available in Kitchener-Waterloo the waiting period may be less" [Dr. B]*
- *"I contacted a colleague who is an obstetrician/gynecologist...this was my first choice of information, one because I trusted the source and it was much more efficient than trying to source it out through the literature" [Dr. G]*
- *"The fact that we have easy access to a gastroenterologist here, although some may take a while, made me make the referral" [Dr. B]*

Perceived credibility of the source influenced the choice of resource accessed by the physician; this factor was cited for internet sources, consultations with interprofessional health care providers as well as specialists.

- *"I found a good reputable medical site from the Urological Association and found out some more information" [Dr. E]*
- *"The source I went to was our clinical pharmacist, [name], as I know that he is an expert in this area" [Dr. L]*
- *"I contacted a colleague who is an obstetrician/gynecologist and someone who had done some extra training in sexual medicine and was known in this community as a sexual medicine expert" [Dr. G]*
- *"I had considered utilizing internet searches to look up this topic, but again partly as a time and convenience factor and concerns about the validity of the data that I would be finding and the importance of clinical experience, I felt more comfortable talking to the obstetrician in many ways and I knew who the obstetrician was and had high regard for her input" [Dr. L]*

Although appropriateness of consultation with specialists was considered, particularly regarding telephone consultations, physicians described their level of comfort with the relationship they had with the specialist as influencing their decision.

- *"Probably the simplest resource would have been just to discuss with a Gastroenterologist as to the need for repeat investigations given normal investigations in the past three years. I elected not to do so as I felt it was inappropriate to interrupt a specialist's time with a question that I could have probably solved independently and given that the problem was not of a magnitude that it warranted interruption of their office" [Dr. G]*
- *"Other resources that I would have liked to have used or considered using but didn't would have been a referral to the emergency department but felt that this*

patient was optimized from a medical point of view pending other information and I didn't think it would change outcome...I think in hind sight that this was an appropriate use of external resource utilization" [Dr. J]

- *Other resources that I would have liked to have used, or considered using but didn't was really just a direct call to our cardiologist. I didn't use this due to lack of resources and lack of contact in the community with whom I felt comfortable to call and discuss this over the phone. The one cardiologist that I do speak with was out of town for holidays" [Dr. J]*

The physician's perception of the likelihood of finding the required information also influenced their choice of resource accessed.

- *"I did not feel that any internet or text book resources would satisfy my uncertainty. I had considered asking a colleague in the office for his or her opinion, but again I did not feel that they would be able to tell me anything that would reassure me that I did not need to have a pediatrician involved" [Dr. L]*
- *"I could have also looked at the College of Physicians and Surgeons material or the CMPA for their opinion but I felt that their answers would have taken time and would have been less specific than the information that I received from Family and Children's Services" [Dr. C]*
- *"So the external resource that I used in this case was again the on call paediatrician. I decided to use this source rather than textbooks as I felt that this was more of an experienced clinical decision that I may not be able to readily find in textbooks" [Dr. L]*

Lack of access to diagnostic equipment or investigations was cited as factors influencing referral of patients.

- *“I used to use Fluorescein drops here to assess things, but because we don’t have a slit lamp I have decided to basically send everyone off like that in our town” [Dr. B]*
- *“If I had instant lab results I would have done some blood work and microscopic urine and a proper laboratory urinalysis prior to referring her, but I don’t have access to those immediate answers, so sending her to the hospital to see the paediatrician seemed to make good sense” [Dr. H]*
- *“He has had a lump that he has noted along with the pain and as I said the hematospermia. This concerns me about the possibility of torsion of the testicle which I can’t rule out here. I don’t have the ability to get an ultrasound on the weekend...I can’t leave him without an ultrasound for a fair length of time” [Dr. B]*

5. Access to external resources appeared to be a complicated and variable influence on the physician-patient relationship.

Some physicians described the importance of accuracy of information they provide in maintaining patient trust and satisfaction with care, and the potential for harm to the patient and the relationship if incorrect information was provided.

- *“How important was it that I utilize this resource as opposed to just pressing on? I think it was important as this was a concern to the patient and it affected her quality of life. It was also very important as my credibility with the patient was*

important. I didn't want to give her a quick answer and be wrong, or give her a flip answer and not address her concern adequately" [Dr. G]

- *"Discussion with the patient was concerning risk of vaginal cancer and the still controversial effects of cervical dysplasia and cervical cancer. In hind sight using these resources helped improve the clinical encounter and the patient satisfaction with it" [Dr. C]*
- *"I felt some pressure from her and from her dislike of the cardiologist. I felt like the patient physician relationship would have been impaired if I didn't take her concerns seriously since she was very adamant that she felt one medication was the culprit" [Dr. J]*
- *"I don't think that any harm would have come to the child, but it was important to ensure proper management and also for other relationships with the patient, giving incorrect information might lead to mistrust in the future" [Dr. G]*
- *"The importance of the answer clinically isn't great as I would likely treat him the same way and I am probably sending him [to a dermatologist] sooner than otherwise would have...But the reason for using an external resource is for patient satisfaction" [Dr. B]*
- *"I just think that I was very concerned about not causing this chronically ill patient any more problems by causing a medication reaction" [Dr. I]*

Some physicians described a need for a professional appearance, and information obtained through external resources contributed to their sense of appearing more knowledgeable in front of the patient.

- *"I felt a significant amount of pressure because the patient was with me that I wanted to look professional and I wanted to be quite certain about any advice that I would give the patient regarding malaria risk" [Dr. E]*

Others openly disclosed their feelings of uncertainty to the patient.

- *"I was kind of worried about this and I had never prescribed Adderall. So in his case I just said that I would go and look on the computer at the latest information on Adderall and in fact I just went to my office and I looked in the CPS, the 2008, and got the latest information" [Dr. F]*
- *"It was toward the end of a very busy morning and I had patients to see, and I was running behind. Rather than giving a flippant answer, I suggested that she follow up and allow me some time to look up treatment" [Dr. G]*

In considering the preferences and circumstances of the particular patient, physicians described the complexity of different treatment options and providing informed choice to patients as reasons for accessing external resources.

- *"Because of the serious nature of the illness and also the patient's reluctance to look at conventional therapy I looked to both eMedicine search of Nortrexin and Multiple Sclerosis and also previously had spoken with a Neurologist concerning the use of Nortrexin with M.S" [Dr. C]*
- *"I felt that this was a mature well educated patient, and that he understands the consequences of his decision, but I wanted to make sure that I gave him all the information that I could in order to allow him to make a really informed decision" [Dr. I]*

- *“The information was sought for the patient’s benefit to let her know the costs of various medications and helped in choosing an appropriate prescription” [Dr. A]*
- *“I am usually comfortable with obstetrical care because I have done lots and I have had patients with musculoskeletal abnormalities in their babies so I feel quite comfortable discussing this with her, but want to set up all the appropriate resources for her and her partner during the pregnancy so that she is as informed as she can be” [Dr. H]*

2.5 DISCUSSION

Results of this study identified situational cues associated with physicians seeking external help in decision-making in response to clinical uncertainty in a primary care practice setting. Specific features of the patient encounters cued physicians to stop and think and access external sources for help. These included both social and medical aspects of the case.

Literature has described important social influences affecting physicians’ decision making processes that include characteristics of the patient, physician, medical problem or illness, test/treatment,^{28(p 174),29,30,31} and organizational structure. Qualitative studies have found that patients with high anxiety levels or greater worry about their symptoms or patients who are distrustful are perceived by physicians as being amongst the most “difficult” of patients.^{32,33,34,35,36, 37} A study of internists associated the greatest degree of emotional reaction with patient behaviors or circumstances which actively threatened their integrity or self-esteem, such as when patients were disrespectful, critical, or demeaning or expressed anger towards the physician.³⁷ Physicians have described feelings of distress during or after a patient encounter, including feelings of sadness, being overwhelmed, anger, and rejection. Poor attitude towards psychosocial aspects of patient care has been found to be strongly predictive of physicians experiencing more encounters as being difficult.

The results of this study support the importance of social influences. This was particularly noted when the patient or others attending with the patient were perceived as being anxious, demanding, or mistrustful, and reflected in statements indicating the physician's desire to ensure higher patient satisfaction through access to external resources. There has been little written about the mechanism of this influence.³² This study suggests that the mechanisms of influence may involve generating greater need to foster patient trust and satisfaction with care, with access to external resources providing a means of alleviating patient anxiety and meeting psychosocial needs, or by generating greater feelings of the physician's need to defend his or her decision-making. While the desire to please and the desire to defend are two competing hypotheses in terms of offering a mechanism of influence under these circumstances, there is little reason to believe that only one mechanism might be functional. Further study is required to determine the relative importance of these influences as well as other mechanisms that may be involved.

Access to external resources appeared to provide a means of alleviating the anxiety of the patient or person accompanying the patient and was often noted by physicians as a reason for referral of the patient to a specialist or request for a telephone discussion between the family physician and specialist. Several physicians described feelings of significant patient pressure in influencing their decision to access an external resource such as specialist referral. Literature supports the desire to foster patient trust and satisfaction with care as a factor motivating a significant number of referrals, in some studies being the underlying reason in approximately 14% to 20% of new referrals.^{38,39} Indeed, patients who perceived a need for referral but had difficulty obtaining one have reported low trust, confidence, and satisfaction with their primary care physician.⁴⁰ Degree of patient pressure has been shown in the literature to increase physicians' likelihood of acceding to requests such as referral to specialists, prescribing of medications, and ordering of investigations.^{41,42,43,44,45,46,47,48} Degree of patients' symptom elaboration has also been shown to be a main determinant of pressure

perceived by physicians.^{49,50} Several physicians in this study alluded to the degree of suffering expressed by the patient as contributing to their decision to refer the patient to a specialist.

Specific medical aspects of the case also acted as cues that prompted physicians to seek external help in decision-making. These included involvement of unusual or atypical presentations and failure of previous treatment attempts. Ambiguity of presenting symptoms is particularly relevant to primary care medicine, where a significant number of patient visits involve physical symptoms that remain unexplained despite medical work-up. Studies have demonstrated that the frequency of patient visits to their primary care physician involving unexplained physical symptoms ranges from 13% to 19%.^{51,52} For particular symptoms such as chest pain, fatigue, dizziness, headache, back pain, or abdominal pain, one large study found explainable organic cause in only 16% of cases.⁵³ A survey study of 13,538 patients revealed that nearly one third reported suffering at some point in their life from significant physical symptoms for which no physical cause was identified.⁵⁴ These patient visits remain a challenge for primary care physicians as patients with unexplained physical symptoms have been shown to consult their primary care physician four times more often than the general population.⁵⁵

Studies have demonstrated varying physician responses to medically unexplained complaints. These include excessive ordering of up to twice as many laboratory tests and greater numbers of referrals to specialists.⁵⁶ The reasons for these physician behaviors are unclear. Salmon et al. postulates that this may reflect either the physician's misperception of what these patients seek or a way of avoiding emotional engagement with these patients.⁵⁷ Studies have suggested that a common physician response to ambiguity of the patient presentation is to deny the ambiguity and become more directive with the patient, involving less inquiry and less inclusion of patients' perspectives on their symptoms.^{58,59} Excessive ordering of tests and referrals to specialists may be a means of avoiding further engagement with these patients. Epstein

et al. suggest that because ambiguous symptoms do not fit into recognizable and coherent patterns of illness that activate the physician's complex heuristics or illness scripts, greater cognitive effort is required to resolve the problem resulting in greater physician anxiety with not being able to resolve the problem efficiently.⁵⁹ Borrell-Carrio and Epstein describe the concept of critical tension which becomes extreme in ambiguous or atypical situations, with the physician's ability to act rationally being affected by a desire for reduction of this tension and resulting in the tendency towards premature closure. The physician's ability to tolerate the emotional tension of not knowing may be influenced by factors such as fatigue, degree of motivation, urgency to finish, excessive workload, or poor clinical skills.⁶⁰

Access to external resources appeared to alleviate the physician's own anxiety. Physicians in this study frequently described a sense of knowing the answer but wanting reassurance, and information provided by the external resource served to reassure them. This was particularly noted in cases involving potentially serious medical conditions, with the seriousness of the presenting symptoms acting as a cue that prompted physicians to seek external help in decision-making. In these cases, several physicians described concerns about the consequences of incorrect diagnosis and management. Such findings may support concepts of the "chagrin factor" and "regret theory" described in the literature. These theories suggest that physician anxiety about missing an important diagnosis and subsequent regret are important considerations in the ordering of referrals and investigations and can be significant factors affecting rational, probabilistic decision-making.^{61, 62,63,64,65,66}

While in most cases physicians identified specific areas of knowledge deficiency for which information was being sought, in some cases physicians identified broad areas of knowledge deficiency that made them particularly careful with the case and more apt to seek external help. For example, one physician stated, "I am particularly weak in

Rheumatologic diseases and I am aware of that...The personal factors that made me seek an external resource [are] just that I know I am bad with rheumatology.”

However, literature suggests that as a generic skill, the capacity for physician self-assessment of performance or ability is poor.^{1,2,11,12,13,14,22} Therefore, while indicating a degree of physician caution acting as a cue to seek external help, such comments may be more reflective of the physician’s confidence in his or her abilities rather than an accurate assessment of knowledge deficiency.

Other comments reflect a mindfulness of personal influences on the need for obtaining further information, such as, “I am a type A personality, so I always want to be precise and correct...” The importance of mindfulness has been described in the literature.^{67,68} Several physicians’ comments demonstrated the concept of “critical tension” as described by Borrell-Carrio and Epstein. This concept suggests that when faced with the challenge of solving the patient’s problem, physicians experience a degree of emotional tension which increases to critical tension threshold, at which point the physician will seek to resolve the patient’s problem in order to reduce this psychological tension. Physicians described this tension in various ways such as needing to “reassure myself that I wasn’t missing anything”, “it is more an internal pressure, not an external pressure,” and a feeling of “groping in the dark for answers.”

Physicians described consultation with specialists as a valued form of external resource. Choice of specialist was influenced by availability, credibility, presence of existing relationship with the specialist and appropriateness of the consultation, particularly when seeking telephone advice. These findings concur with results of previous studies that suggest that physicians’ personal knowledge of the consultant increases the likelihood of referral to that consultant.⁶⁹ Results of the thesis study suggest the importance of specialists’ availability in the decision to refer. However, previous studies have demonstrated variable influence. Two studies have suggested a strong correlation

between greater availability and likelihood of referral,^{70,71} while one study has suggested no influence.⁷²

Some physicians justified the decision to refer to specialists because they felt it to be unlikely that the information required could be found with access to other forms of external resources. In many cases, the information required was highly contextual and specific to the particulars of the case. Literature supports the difficulty in finding specific answers to clinical questions through access to external resources such as the internet; for example, in 2004, Koonce found that only 20% of complex questions could be answered completely by searching internet-based evidence based medicine resources.⁷³

Physicians described a variety of influences on their choice of external resource accessed. Ease of access, efficiency of obtaining the required information, and credibility of the source were cited as important factors. In the literature, various models relating use of information resources to influencing factors have emphasized the importance of ease of access and efficiency in obtaining information for physicians. Shaughnessy et al. described the usefulness of medical information as being inversely related to the work done to obtain the information: $\text{Usefulness of medical information} = \text{relevance} \times \text{validity} / \text{work}$.⁷⁴ Similarly, Connelly et al. described a utility-cost model in which the decision to seek additional knowledge was seen as a compromise between the conflicting goals of a need for information that reduces uncertainty, and a resistance to time, effort, or monetary expenditures.⁷⁵ Studies have suggested that access variables such as availability, searchability, understandability, and clinical applicability are more related to the physician's use of the resource than qualities such as extensiveness and credibility of that resource.⁷⁶ Convenience and time required to find relevant and clinically useful information appear to be particularly important factors influencing physicians' use of a resource.^{77,78}

Physicians in this study also accessed internet resources to improve patient confidence in the decisions being made, providing further information on the condition for the patient and reassurance. In accessing external resources, physicians described the importance of considering the preferences and circumstances of the particular patient and providing informed choice to patients. Such considerations reflect elements of a patient-centered model of care. The patient-centered clinical method emphasizes a sharing of information with patients and mutual participation in decision-making^{79(p.88,99)}, as do current ideal models of the patient-physician relationship which encourage a shift from a paternalistic model (in which the physician determines what is best with limited patient participation) to newer models involving shared decision-making responsibilities with patients.⁸⁰

2.6 STRENGTHS, LIMITATIONS, AND IMPLICATIONS

The purpose of this study was to identify the situational circumstances which cued physicians to “stop and think” and recognize a need for external help in decision-making in response to clinical uncertainty. As a qualitative study involving a relatively small number of community family physician participants, the results may not be generalizable to all family physicians in other settings and, as an exploratory study, conclusions cannot be drawn as to rank of importance of the situational cues or types of resources accessed. Further studies would be required.

Results may also be limited by the relatively small selection of patient encounters on which physicians were asked to report. For example, physicians reported access to external resources when there was concern about potentially serious conditions. As participants would not have reported on other potentially serious cases seen which did not prompt use of external resources, it is unclear whether physicians adopted a general strategy to access external resources when faced with serious conditions or whether the cues were patient-specific.

Although the methodology might be subject to limitations in accuracy and post-hoc justification of behaviors, unlike most studies which use retrospective generic techniques for information collection, we attempted to minimize these inaccuracies by arming physicians with Dictaphones to capture their in-the-moment thinking about cues that prompted the behavioral outcome of seeking information from an external resource. Literature has suggested that physicians may significantly underestimate their self-perceived information needs when based on self report at the end of the office session.⁸¹ Other studies have found that as a method of data collection, post hoc self-reporting on cognitive process may be accurate if influential stimuli are felt to be salient and plausible causes of the response they produce⁸² and if retrospective verbalization methodology requires verbal responses which lag the task processes by only a brief interval.⁸³ Therefore, to promote most immediate recall of information, it was requested that participants dictate into hand-held Dictaphones as soon as possible after these instances occurred, encouraging the description of the in-the-moment need to seek external resources closer in time to the event than in most studies. As well, a set of questions acted as prompts to encourage an accurate and detailed description of the circumstances of the case.

For these reasons, we believe the results meaningfully advance knowledge of important situational circumstances which may prompt the family physician to access external resources. Knowledge of these cues can provide information about situations of clinical uncertainty that seem most troublesome for physicians and influences on the type of external resource they are likely to access in those circumstances. Studying the likelihood of physicians choosing a particular resource in each of these circumstances provides an important opportunity for further study. This information may assist in planning for better access to these types of resources with the aim of facilitating safe and efficient clinical decision-making under these circumstances and improving patient satisfaction with the care process.

2.7 CONCLUSIONS

This qualitative thesis study provides information on the situational circumstances associated with physicians seeking external help in decision-making in response to clinical uncertainty in a real primary care practice setting. Identified situational cues included both medical aspects of the case such as unusual or complex presentations, potentially serious conditions, failure of previous treatment attempts, and social aspects of the case such as patients or others attending with the patient being perceived as being anxious, demanding or mistrustful. To some extent, factors specific to the physicians themselves also acted as cues. These included self-identified gaps in personal knowledge or a personal need for greater certainty. Access to external resources often acted as an opportunity for verification of the diagnosis or management plans and was especially noted in cases that might involve a serious condition or have potentially serious consequences with incorrect diagnosis or management. Choice of external resource was influenced by ease and efficiency of obtaining the required information and credibility of the source; this was particularly relevant to physicians in Family Health Teams in their decision to refer to interprofessional health care providers. The decision to refer to specialists was influenced not only by the medical appropriateness of the referral and use of resources, but by the level of comfort with the relationship with that specialist. In accessing external resources, physicians ascribed various reasons for the importance of feeling more certain, ranging from a personal need for greater certainty to patient need for greater certainty to the strengthening of the physician-patient relationship by providing accurate, patient-specific information.

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CHAPTER 3
UNCERTAINTY AND INFORMATION-SEEKING IN
FAMILY PRACTICE:
A SURVEY OF COMMUNITY FAMILY PHYSICIANS

3.1 INTRODUCTION

Literature suggests that there are many factors affecting physicians' clinical decisions about patient management. For example, the decision to refer to specialists has been shown to be influenced by medical and non-medical factors, most often both.¹ Other studies have demonstrated the involvement of a complex mix of patient, physician and health care system structural characteristics in these decisions.² In studying variation in physicians' referral rates, O'Donnell's systematic review has identified four broad groups of factors: *physician associated factors*, including tolerance of uncertainty; *patient associated factors*, including expectations, needs and values, pressure for referral, and preferences; *case specific factors*, including type of condition and perceived seriousness; and *structural factors*, including waiting lists and practice organization.³ Similarly, patient pressure and expectation,^{1,4,5} perception of patients as demanding^{6,7} and presence of ambiguous or medically unexplained symptoms^{8,9} have been identified in other studies as important patient and case associated factors that increase physicians' likelihood to refer.

With respect to physicians' tolerance of uncertainty, initial studies of physician reactions to uncertainty focused on the concept of general tolerance of uncertainty, with early studies using various psychological instruments that measured general intolerance of ambiguity¹⁰ and risk-taking attitudes.^{11,12,13} Results of these studies were limited by the psychological constructs being measured being unrelated to the specific circumstances of physicians, such that the applicability of such broad measures has been questioned in relation to physician practicing behavior.

Gerrity et al. felt that a better understanding of physicians' responses to uncertainty might be obtained by measuring dimensions such as "stress from uncertainty" and "reluctance to disclose uncertainty to others," rather than physicians' general tolerance of uncertainty.¹⁴ The Physicians' Reactions to Uncertainty (PRU) Scale was developed to measure physicians' affective reactions to uncertainty, broadly defined as (a) the emotional reactions and concerns engendered in physicians who face clinical situations that are unfamiliar or not easily resolved and (b) the behaviors used by physicians to cope with those emotions and concerns. The PRU Scale attempts to integrate cognitive and affective internal processes with social and cultural external influences based on five major elements: the patient, the physician, the medical problem or illness, test and treatment characteristics, and the organizational environment. In its revised version, the PRU scale incorporates four subscale constructs: Anxiety Due To Uncertainty, Concern About Bad Outcomes, Reluctance To Disclose Uncertainty To Patients, and Reluctance To Disclose Mistakes To Physicians.¹⁵

Either in its entire original or revised form or in part as a component subscale incorporated into other instruments, the PRU scale has been used as a measure of physician uncertainty in a broad range of studies. For example, higher PRU scores interpreted as reflecting greater discomfort with uncertainty have been associated with lower work-related satisfaction amongst physicians in a broad range of disciplines¹⁶, higher perceptions of risk of being sued amongst radiologists¹⁷, different searching processes when using electronic information resources to answer simulated clinical questions¹⁸, and differences internationally with UK physicians demonstrating more discomfort with uncertainty than US physicians.¹⁹ Several studies^{16,18,20} have used selected components of the PRU scale, principally "Anxiety due to Uncertainty" and the "Concern about Bad Outcomes" subscale questions, as these domains were felt to be most relevant to the study.

Of particular relevance to this thesis study, the PRU scale has been used as a measure of physician uncertainty in studying its relationship with physicians' decision-making in patient management. Amongst specialists, radiologists with higher anxiety due to uncertainty were more likely to report mammograms with higher recall rates, lower specificity, and lower odds of a cancer diagnosis given a positive mammogram. General internists have been found to have greater anxiety due to uncertainty and greater risk aversion than family physicians and this was felt to be responsible for greater HMO resource expenditures generated by internists.^{21,22}

Amongst primary care physicians, several studies have not demonstrated an association between PRU scores and tendency to refer to specialists. Frank et al., Bachman et al., and Forrest et al. found little to no association between likelihood of referral and Anxiety Due to Uncertainty and Concern about Bad Outcomes subscales of the PRU.^{2,23,24} Forrest et al. found small effects of Reluctance to Disclose Uncertainty subscores on referral rates, but Bachman et al. found no effect of these subscores.

However, the results of some of these studies may have been affected by other factors. For example, these studies involved US physicians and results may be influenced by pressure to control referral costs. Forrest et al. estimated that approximately half of the participants in his study received referral utilization profiling reports and one quarter of participants felt moderate or great pressure to control referral costs. As Canadian physicians do not receive utilization reports, a study restricted to Canadian physician participants may reduce the likelihood of external pressure to control referral costs acting as a biasing factor. As well, the study by Forrest et al. defined "referral" as the physician's decision to send the patient to see any specialist practitioner which included physicians and non-physicians with specialized skills, and excluded referrals to the emergency department and verbal advice obtained from specialists. A study that distinguishes between these types of referrals and explores physicians' likelihood of informally consulting specialist and family physician colleagues may be valuable as these

may be other important external resources that are accessed by primary care physicians.

Most studies have also not compared the use of referrals to other types of information sources that family physicians might choose to access when feeling uncertain in clinical practice. Such resources would include reference manuals and textbooks, internet sources, or referral to an allied health care professional.^{25,26} Use of allied health care professionals and family physician colleagues as a resource would be of current interest with Ontario's shift towards Family Health Teams as a preferred model of primary care practice since 2005. The Family Health Team model encourages family physicians to practice in groups and in close affiliation with inter-professional health care providers. There appears to be no published literature on the patterns of referrals to inter-professional health care providers within Family Health Teams as compared to other existing models of primary care.

The qualitative study reported in this thesis (chapter 2) revealed the perception of patient pressure to be a significant factor influencing physicians' decisions to refer for specialist consultation. Literature supports the desire to foster patient trust and satisfaction with care as a motivating factor for referrals; in some studies, this was the underlying reason for approximately 14% to 20% of new referrals.^{1,27} Degree of patient pressure has been shown in the literature to increase physicians' likelihood of acceding to requests to refer to specialists^{4,5,6,7,28,29}, and patients who perceived a need for referral but had difficulty obtaining one have reported low trust, confidence, and satisfaction with their primary care physician.³⁰ While these studies suggest that a desire to foster patient satisfaction may motivate a significant number of referrals, little is known about the influence of perceived patient satisfaction with care in motivating the physician to access other forms of information sources such as reference manuals and textbooks, internet sources, or consultation with an allied health care professional. Exploration of the influence of perceived improvement in patient satisfaction with care

might provide insight into the physicians' decision to access these other types of external resources.

Finally, most studies have not addressed physicians' choice of information sources as it relates to the particular clinical situational circumstances. As summarized in Table 1, the qualitative study of this thesis found that common presentation cues that prompted physicians to seek external information included unusual or complex conditions (e.g. multiple conditions or multiple medications involved, psychosocial issues), potentially serious conditions, and failure of treatment attempts, as well as the social pressures of a patient or person attending with the patient being perceived as being anxious, demanding, or mistrustful. Building on these themes, this quantitative thesis study will explore the relationship between these different situational cues and the specific type of external resource that the family physician may be more likely to access. Table 2 summarizes key resources utilized by family physicians along with supporting references. An attempt will be made to distinguish between formal and informal specialist consultation as well as consultation with family physician colleagues, and to compare the likelihood of using these resources to use of reference manuals and textbooks, internet sources, and referral to an allied health care professional (non-physician health professionals including pharmacists, dietitians, social workers, etc.) In accessing these various types of resources, physician's perception of patient satisfaction with care will be studied. Additionally, this study will explore the relationship between physicians' tolerance of uncertainty as measured by the validated Physicians' Reactions to Uncertainty scale and their reported likelihood to access the above resources when feeling uncertain. Using Canadian primary care physician participants may limit the influence of external pressure to control referral costs that may have affected results of previous studies involving US primary care physicians.

Table 1. Common presentation cues that prompt physicians to seek external information*

Case involves an unfamiliar condition
Case appears complex
Case involves a failure of previous treatment attempts
Case involves a potentially serious condition
Case in which the patient seems anxious or demanding
Case in which the person accompanying the patient seems anxious or demanding
Case in which the patient seems distrustful or dissatisfied with the diagnosis or proposed treatment plan

*based on results of thesis qualitative study, described in Chapter 2

Table 2. Key information resources accessed by physicians

Resources	Study
Reference manuals or textbooks	Davies <i>et al.</i> , Dawes <i>et al.</i> , Connelly <i>et al.</i> ³¹ , Dorsch ³² , Ely <i>et al.</i> ³³ , Ely <i>et al.</i> ³⁴ , Gonzalez-Gonzalez <i>et al.</i> ³⁵ , Gorman <i>et al.</i> ³⁶
Internet sources	Ely <i>et al.</i> , Bennett <i>et al.</i> ³⁷ , Bennett <i>et al.</i> ³⁸
Ask a family physician colleague, or Ask a specialist (informal consult), or Refer to a specialist (formal consult)* Refer to an allied health care professional	Davies <i>et al.</i> , Dawes <i>et al.</i> , Connelly <i>et al.</i> , Dorsch, Ely <i>et al.</i> , Ely <i>et al.</i> ³⁴ , Gonzalez-Gonzalez <i>et al.</i> , Gorman <i>et al.</i> ³⁶ Gorman <i>et al.</i> ³⁶

*distinction not made between formal and informal consults made to specialists, or type of colleague consulted (family physician or specialist)

3.2 OBJECTIVES

3.2.1 Primary Research Question and Hypothesis

- (1) In clinical encounters that provoke uncertainty, does the type of situational cue affect the type of external resource that the family physician is likely to access?

It is hypothesized that physicians will report greater likelihood to refer to a specialist over access to other forms of external resources in cases involving unusual or complex presentations and when patients or others attending with the patient are perceived as being anxious, demanding or mistrustful. It is additionally hypothesized that in cases that might represent a serious condition or might involve potentially serious consequences with incorrect diagnosis or management, physicians will also report greater likelihood to refer to a specialist over access to other forms of external resource, as the qualitative study of this thesis demonstrated the need for verification of the diagnosis or management plans to be particularly important in these cases.

These hypotheses are supported by studies demonstrating that credibility of source, ease of access to information, and likelihood of finding the required information can influence the physician's choice of information resource accessed.^{31,39,40} Factors that have been found to increase the likelihood of patient referral include ambiguous or medically unexplained symptoms, patient pressure and expectation of referral or perception of patients perceived as being demanding.^{1,4,5,6,7,8,41,42}

3.2.2 Secondary Research Questions and Hypotheses

- (2) Does the family physician's perception of patient satisfaction with care vary as a function of the type of external resource accessed?

It is hypothesized that physicians will report greater perceived patient satisfaction with care when a specialist referral is made as compared to use of other types of external resources. This hypothesis is based on literature indicating the desire to foster patient trust and satisfaction with care as a motivating factor for specialist referrals.^{1,27}

- (3) In clinical situations that provoke uncertainty, do family physicians with greater discomfort from uncertainty (as reflected by a greater PRU score) report greater likelihood to refer the patient for specialist consultation?

It is hypothesized that family physicians who experience greater discomfort from uncertainty (as reflected by a greater PRU score) will be more likely to refer the patient for specialist consultation.

Of related interest was to determine whether PRU score was associated with specific variables such as likelihood of referral to a specialist, estimated percentage of cases in which patient satisfaction with care is improved with referral to a specialist, and estimated number of informal consultations made per week to a family physician colleague or specialist.

Although literature has demonstrated little or no relationship between primary care physicians' tolerance of uncertainty and their tendency to refer to specialists,^{2,23} these studies have been limited by their methodological design in

that results may have been influenced by external pressure to control referral costs or defining “referral” to include any specialist practitioner including physicians and non-physicians while excluding referrals to the emergency department and verbal advice obtained from specialists. The methodological design of the present study attempts to limit these influences on the results. The hypothesis that tolerance to uncertainty will affect physicians’ decisions in patient management is supported by findings in the literature that greater stress from uncertainty (as reflected by a greater PRU score) has been shown to affect specialists’ decisions in patient management.^{20, 21}

- (4) Do family physicians belonging to a Family Health Team report greater likelihood to consult with allied health care professionals (inter-professional health care providers) than physicians who do not belong to a Family Health team?

Because results of the qualitative study of this thesis have suggested that ease of access is an important factor influencing choice of external resource accessed, it is hypothesized that physicians belonging to a Family Health Team will report greater likelihood to consult with allied health care professionals (inter-professional health care providers) than physicians who do not belong to a Family Health team.

3.3 METHODS

3.3.1 Setting

The participants included family physicians with an academic affiliation with the Department of Family Medicine, McMaster University or an academic affiliation with the Department of Family Medicine, University of Western Ontario, as well as a smaller

group of non-academic community family physicians currently practicing in Kitchener-Waterloo and Cambridge, Ontario.

3.3.2 Survey Design

The survey was constructed to include 5 parts: Part A, the Physicians' Reaction to Uncertainty scale, a validated survey tool to measure physicians' affective response to uncertainty⁴³; Part B, a survey derived from the themes obtained from the results of the qualitative thesis study to measure physicians' reported likelihood of using various types of external resources when faced with the situational cues that are likely to provoke a feeling of uncertainty and need to access an external resource; Part C, a survey of physicians' perception of the effect of accessing various resources on patient satisfaction; Part D, estimates of numbers of patients seen and informal consultations made per week and comments that participants might wish to make; and Part E, information requested about participant demographics and practice structure.

A pilot study was conducted involving 4 family physician participants to assess face validity and acceptability of Parts B, C, D, and E of the quantitative survey. All participants felt that the survey instrument was acceptable with respect to clarity of questions and instructions and time required and that completion of these questions would not be onerous.

A test-retest pilot study was then conducted to determine reliability of the measurement method used in Parts B, C, and D of the survey. All questions were completed by 8 participants twice, two days apart, and evaluated for a general sense of stability of responses. The results suggested stable responses as the test-retest correlations for all items but one were greater than 0.54 with 42 of 50 items revealing correlations greater than 0.7. For one item ("likelihood of asking a family physician colleague in a case that involves a condition with which you are unfamiliar"), the test-

retest correlation was 0.00, explained by lack of variance in physician responses to this question.

To recruit participants, an e-mail invitation was circulated to all full and part-time family physician members of the Department of Family Medicine, McMaster University, as well as all family physicians affiliated with the Department of Family Medicine, University of Western Ontario, through the Family Medicine Education Research Network. Included in this e-mail was the UWO ethics-approved letter of consent to participate as well as a link to the survey at SurveyMonkey.com. It is estimated that the e-mail invitation to participate was circulated to 502 family physicians affiliated with McMaster and 150 family physicians affiliated with Western. However, this may be an overestimate as family physicians may have affiliations with both Universities and, as a result, may have received duplicate invitations to participate. The extent of this duplication is uncertain; this information could not be obtained despite several inquiries made to the two Departments of Family Medicine. Additionally, an invitation to participate was circulated to 21 community family physicians without academic affiliation that practice in the Kitchener-Waterloo and Cambridge communities.

3.3.3 Sample Size Calculation

The quantitative survey was analyzed using correlation analysis, multiple regression analysis, and analysis of variance (ANOVA).

To calculate sample size for correlations, a standard formula of $n = 4 + 8/r$ was used.^{44(p317)} For a small effect ($r = 0.5$), $n = 4 + 8/0.5 = 20$. For a moderate effect ($r = 0.7$), $n = 4 + 8/0.7 = 15$. Therefore, an estimated minimum of 20 participants was required for correlation analysis.

To calculate sample size for multiple regression analysis, sample size = 10 times the number of variables.^{44 (p 157)} In this study, the variables associated with PRU were explored using a multivariate approach involving 9 key variables (gender, years in practice, group or solo practice, practicing in a Family Health Team, average reported use of referral to specialist, average reported use of consulting with a physician colleague, percentage of cases in that referral to specialist improves patient satisfaction with care, percentage of cases involving a feeling of uncertainty, and estimated numbers of informal consults per week with a family physician colleague or specialist.) Therefore, an estimated minimum of 90 participants was required for this multiple regression analysis.

To calculate sample size for the repeated measures ANOVA used in addressing the primary hypothesis that the type of situational cue will affect the type of external resource accessed by the physician, the standard formula for a difference between two groups, $n = 16s^2/d^2$, was used where s represents the estimated standard deviation and d represents the difference in scores that would be considered meaningful.^(p317) With no way of estimating what differences could be anticipated in this context we hypothesized a difference of 0.75 on the 5-point Likert scales used. A moderate effect size (d/s) is considered to be 0.5 by the conventions established by Cohen. With a difference of 0.75 a moderate effect size is established with a standard deviation of 1.5. Therefore, using $s = 1.5$ and $d = .75$ we estimated that a sample size of 64 was required.

We therefore chose the estimation requiring the largest sample size to guide this study, that being a minimum of 90 participants.

3.3.4 Measures

All parts of the survey are presented in Appendix 1.

Gerrity's Revised Physicians' Reactions to Uncertainty Scale incorporates four subscale constructs with good psychometric properties: Anxiety Due To Uncertainty, Concern About Bad Outcomes, Reluctance To Disclose Uncertainty To Patients, and Reluctance To Disclose Mistakes To Physicians. Satisfactory construct validity, internal consistency, scale internal validity, and test-retest reliability of the four dimensions of the PRU scale have been subsequently confirmed.⁴⁵

In the present study, participants were asked to complete "Part A" that included all components of the Revised Physicians' Reactions to Uncertainty Scale. This consists of fifteen questions, each of which was rated using a 6-point Likert scale: 1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree; questions 4, 9, 10, and 12 were reverse scored.

Based on Gerrity's subscale constructs, of the fifteen questions, five were categorized under "Anxiety due to Uncertainty", three under "Concern about Bad Outcomes", five under "Reluctance to Disclose Uncertainty to Patients", and two under "Reluctance to Disclose Mistakes to Physicians." Subscales were scored by summing the physicians' response to each item in the subscale. If a response was missing, the case was excluded from analysis. Total scores were calculated by summing the scores of the subscales for each physician.

A subtotal of the "Anxiety due to Uncertainty" questions and the "Concern about Bad Outcomes" questions was calculated as well, since several previous studies^{16,18,20} have used modifications the Physicians' Reactions to Uncertainty Scale consisting principally of these two components.

Part B consisted of questions asking participants to estimate the likelihood of accessing each of six types of resources (Table 2) in seven different clinical situations (Table 1) that, based on the results of the qualitative study in Chapter 2, thematically represented

important situational cues likely to provoke a feeling of uncertainty and desire to access external resources. The participant's response involved rating each resource option on a scale of likeliness to use, measured using a 5-point scale that ranged from 1 to 5 with 1 indicating "rarely or never" and 5 indicating "almost always or always."

Part C required participants to estimate the percentage of cases in which they thought the information obtained from a particular resource led to improved patient satisfaction with their care. These resources are listed in Table 2.

Part D required participants to estimate the number of patients they would see in a typical week, the percentage of cases in which they would say they felt uncertain, and the number of times they thought they might speak to a family physician or specialist colleague (informal consult) when feeling uncertain about a clinical situation. Participants were also invited to record any comments they might have about how they dealt with uncertainty in clinical practice and/or accessed external resources in an attempt to deal with that uncertainty.

Part E requested demographic information on the participants including gender, age, years in practice, practice type (group or solo, practicing in a Family Health Team or not).

Information was collected on SurveyMonkey.com. The participant's responses were anonymous and their IP address was not stored in the survey results.

3.3.5 Data Analysis

Data were input into SPSS 17.0 and SAS 9.13 for analysis.

Before merging data between academic family physicians and community family physicians, a one-way ANOVA and chi-squared tests were performed to ensure no significant differences between the academic or community family physicians with respect to several key variables including age, gender, years in practice, estimated number of patients seen per week, PRU score, and PRU subscore.

To address the primary hypothesis, “in clinical situations that provoke uncertainty, the type of external resource that the family physician is likely to access will relate to the type of situational cue that provokes the uncertainty,” a two-way repeated ANOVA was performed with one categorical independent variable being the 6 levels of resource (listed in Table 2) and the other being 7 levels of situation (listed in Table 1), and dependent variable being participant’s response in rating each resource option on a scale of likeliness to use, measured using a 5-point scale. To further assess the relationship between resource and situational cue, repeated-measures ANOVAs were performed for each type of situational cue. To determine which specific type of resource(s) were involved within these statistically significant relationships, Student-Newman Keuls post hoc tests were performed with $p < 0.05$ used as the cut-point for determining statistical significance. As the Student Newman-Keul post hoc test in SAS automatically adjusts values for multiple comparisons, application of a Bonferroni correction factor was not required.⁴⁶

To address the hypothesis, “family physicians’ perception of patient satisfaction with care will vary as a function of the type of external resource accessed,” a repeated-measures ANOVA was performed with the categorical independent variable being type of external resource accessed and the dependent variable being the estimated percentage of cases in which patient satisfaction is improved with use of that particular resource. This was followed by Student-Newman Keuls post hoc tests to determine the particular type of external resource associated with these statistically different perceptions.

To address the hypothesis, “in clinical situations that provoke uncertainty, family physicians who experience greater stress from uncertainty (as reflected by a greater PRU score) may be more likely to refer the patient for specialist consultation,” PRU score results were first assessed for normality using Komogorov-Smirnov and Shapiro-Wilk tests. PRU scores were then analyzed for internal consistency. Finally, multiple regression analysis was used to assess the relationships between PRU score and variables including likelihood of referral to a specialist, estimated percentage of cases in which patient satisfaction with care is improved with referral to a specialist, and estimated number of informal consultations made per week to a family physician colleague or specialist.

To address the hypothesis, “family physicians belonging to a Family Health Team (FHT) will report greater preference to consult with allied health care professionals (inter-professional health care providers) than physicians who do not belong to a Family Health team,” an Independent-Samples T-Test was performed with grouping variable of practicing in a FHT or not in a FHT, and test variable being the estimated improved patient satisfaction with referring to an AHP and average reported likelihood of accessing each of the external resources listed in Table 2.

Additionally, in Part D of the survey, participants were invited to record any comments they might have about how they dealt with uncertainty in clinical practice and/or accessed external resources in an attempt to deal with that uncertainty. These comments were independently reviewed by two individuals to determine common themes; results were then compared and themes organized and re-organized in an iterative process for qualitative analysis.

3.4 RESULTS

A total of 93 family physicians participated in this study, with 72 “academic” family

physicians and an additional 21 “community” family physicians from our local community of Kitchener-Waterloo and Cambridge being recruited via e-mail invitation to participate. No data were obtained from non-responders. Survey response rate was 13.8% at minimum.

3.4.1 Demographics

Demographic information of the participating physicians is provided in Table 3. Of those who provided demographic information, the mean age of family physicians was 48 years (SD 8.87). As expected, the number of years in family practice correlated highly with age ($r = 0.98$), the mean being 20.3 years in practice (SD 10.05). Participants estimated that they saw 130.99 patients per week on average. 61/79 (77%) of participants belonged to a group practice rather than a solo practice, and 45/81 (56%) belonged to a Family Health Team. 44 of 81 (54%) participants were male.

Table 3. Demographics of the 93 participating physicians

		Physicians with academic affiliation		Physicians without academic affiliation		All participant physicians who provided demographic information
		valid	missing	valid	missing	
Gender	Male	35	11	9	1	54% males (n=44)
	Female	26		11		46% females (n=37)
Practice	Group	52	12	9	2	77% in group practice (n=61)
	Solo	8		10		23% in solo practice (n=18)
Family Health Team	Yes	43	11	2	1	56% in FHT (n=45)
	No	18		18		44% not in FHT (n=36)
Age	Range	32 - 66	11	36 - 66	2	32 – 66 years
	Median	49.0		47.5		49.0
	Mean	48.6		47.4		48.0
Years in practice	Range	2 - 40	11	3 - 36	1	2 – 40 years
	Median	22.0		20.5		21.0
	Mean	21.0		19.7		20.3

3.4.2 Merging of Data

It was determined that there were no significant differences in demographics or key variables between the academic and community group of physicians, justifying the merging of two groups. Results are presented in Table 4. This determination involved analysis with a one-way ANOVA with the independent variable of group (academic or community doctor) and key dependent variables of Total PRU score, a subtotal of the PRU incorporating anxiety due to uncertainty + uncertainty about bad outcomes (because several papers had used this measure rather than the total PRU), age, and years in practice. A chi-squared analysis was used to compare categorical variables such as gender, whether they practice solo or in group practice, and whether or not they belonged to a Family Health Team. Demographic differences between groups do not appear to exist ($p > 0.05$ for all comparisons); however, there was a difference between these groups in practice structure. 52/60(87%) of participating academic physicians practiced in group rather than solo practice as compared to 9/19(47%) of community docs, $\chi^2 = 12.7$, $p = 0.001$, and 43/61(71%) of academic physicians belonged to a Family Health Team as compared to 2/20(10%) of community physicians, $\chi^2 = 22.3$, $p < 0.001$. Because there did not appear to be any overall association between these practice structure variables and any other key variables in this study, it was felt that the merging of the two groups was still justified despite these practice structure differences.

Table 4. Comparison of demographics and key variables between academic family physicians and non-academic community family physicians

Variable	Physicians with academic affiliation	Physicians without academic affiliation (community physicians)	Statistics
Age (Mean + SD)	48.6 years (SD = 9.1)	47.4 years (SD = 8.2)	F(1,78) = 0.4, p = 0.5
Years in practice (Mean + SD)	21.0 years (SD = 10.4)	19.7 years (SD = 9.1)	F(1,79) = 0.5, p = 0.5
Estimated number of patients seen per week (Mean + SD)	118.4 (SD = 47.6)	121.4 (SD = 39.1)	F(1,79) = 0.3, p = 0.6
Total PRU Score (Mean + SD)	38.8 (SD = 11.2)	35.1 (SD = 9.6)	F(1,91) = 1.8, p = 0.2
PRU Subscore: anxiety due to uncertainty plus uncertainty about bad outcomes (Mean + SD)	23.8 (SD = 8.3)	21.3 (SD = 7.2)	F(1,91) = 1.6, p = 0.2
FHT Practice (Proportion belonging to a FHT)	70.5%	10.0%	$\chi^2=22.3$, p<0.001
Group or Solo Practice (Proportion belonging to group practice)	86.7%	47.4%	$\chi^2=12.7$, p=0.001
Gender (Proportion male)	57.4%	45.0%	$\chi^2=0.9$, p>0.3

3.4.3 Situational Cues and Resources Accessed

To answer the question, "In clinical encounters that provoke uncertainty, does the type of situational cue affect the type of external resource that the family physician is likely to access?", data were analyzed using a two-way repeated measures ANOVA with one independent variable being the 6 levels of resource (listed in Table 2) and the other independent variable being the 7 levels of situation (listed in Table 1). The dependent variable was the participant's response in rating each resource option on a scale of likeliness to use, measured using a 5-point scale. Results indicate a statistically

significant interaction between type of situational cue and type of resource accessed: $F(30,2130) = 19.77$, $MS 7.6$, $p < 0.001$. There were also statistically significant main effects of resource, $F(5,355) = 32.07$, $MS 116.6$, $p < 0.001$, as well as situation, $F(6,426) = 47.98$, $MS 51.4$, $p < 0.001$. (Table 5)

With the knowledge that a statistically significant relationship exists between situational cue and type of resource accessed, a repeated measures ANOVA was performed for each type of situational cue to determine what these relationships were. Results indicated a statistically significant difference in type of resource that physicians were likely to access when encountering each type of situation (Table 5). Student Newman-Keuls post hoc tests were then performed using SAS to determine that specific type of resource(s) were involved within these statistically significant relationships, with comparisons reported for $p < 0.05$. As the Student Newman-Keul post hoc test in SAS automatically adjusts values for multiple comparisons, application of a Bonferroni correction factor was not required. Results are as follows:

- In a situation where the physician feels the condition is unfamiliar, there was a statistically significant difference in type of resource that physicians were likely to access, $F(5, 440) = 26.14$, $MS 21.6$, $p < 0.001$. Post hoc testing indicated that physicians report they were most likely to access internet sources (B) and refer to a specialist (E) in this situation; this likelihood is significantly greater than their likelihood of accessing reference manuals or text books (A) ($p < 0.05$). Physicians reported they would be least likely to refer to an allied health care professional (F) ($p < 0.05$) in this situation.
- In a situation where the case appears complex, there was a statistically significant difference in type of resource that physicians were likely to access, $F(5,435) = 13.09$, $MS 10.7$, $p < 0.001$. In this situation, post hoc testing indicated that physicians report they were most likely to accessing internet sources (B) or

ask a family physician colleague (C) or refer to a specialist (E) ($p < 0.05$) as compared to use of other types of resources.

- In a case that involves failure of previous treatment attempts, there was a statistically significant difference in type of resource that physicians were likely to access, $F(5,435) = 30.39$, $MS 25.9$, $p < 0.001$, $p < 0.001$. Post hoc testing indicated that in this situation, physicians report they were most likely to refer to a specialist (E) ($p < 0.05$) as compared to use of all other types of resources. They reported they would be least likely to refer to allied health care professionals (F) ($p < 0.05$) in this situation.
- In a case that involves a potentially serious condition, there was a statistically significant difference in type of resource that physicians were likely to access, $F(5,425) = 65.88$, $MS 64.5$, $p < 0.001$. Post hoc testing indicated that in this situation, physicians report they were most likely to formally refer to a specialist (E) ($p < 0.05$) and were next most likely to speak to a specialist (informal consult) (D) ($p < 0.05$). They reported they would be least likely to refer to an allied health care professional (F) ($p < 0.05$) in this situation.
- In a case in which the patient seems anxious or demanding, there was a statistically significant difference in type of resource that physicians were likely to access, $F(5,430) = 13.82$, $MS 11.3$, $p < 0.001$. Post hoc testing indicated that in this situation, physicians report they were most likely to formally refer to a specialist (E) ($p < 0.05$) over use of all other types of resources. They report they would be least likely to access internet sources (A) ($p < 0.05$) or speak to a specialist (informal consult) (D) ($p < 0.05$) in this situation.
- In a case in which the person accompanying the patient seems anxious or demanding, there was a statistically significant difference in type of resource

that physicians were likely to access, $F(5,435) = 13.13$, $MS 8.6$, $p < 0.001$, Post hoc testing indicated that in this situation, physicians reported they are most likely to formally refer to a specialist (E) ($p < 0.05$) over use of all other types of resources.

- In a case in which the patient seems distrustful or dissatisfied with the diagnosis or proposed treatment plan, there was a statistically significant difference in type of resource that physicians were likely to access, $F(5,425) = 45.25$, $MS 37.0$, $p < 0.001$, Post hoc testing indicated that in this situation, physicians report they were most likely to refer to a specialist (E) ($p < 0.05$) over use of all other types of resources.

In summary, for all situations described, physicians reported that they are most likely to refer to specialists. However, when faced with conditions that seem unfamiliar or complex, they are also as likely to access internet sources, and in complex situations, they are as likely to consult with family physician colleagues.

Table 5. Mean and Standard deviation of physicians' reported likelihood of accessing each resource in the clinical situations described

Situation	Resource						Grand Mean	Significant pairwise comparisons, $p < 0.05$
	Reference manuals or textbooks (A)	Internet sources (B)	Ask a family physician colleague (C)	Ask a specialist (informal consult) (D)	Refer to a specialist (formal consult) (E)	Refer to an Allied Health Care Professional (F)		
Case involves an unfamiliar condition	M = 3.25, SD = 1.12	M = 3.98, SD = .97	M = 3.57, SD = .95	M = 3.10, SD = 1.00	M = 3.82, SD = .68	M = 2.65, SD = .99	3.40	B, E > A A → E > F
Case appears complex	M = 2.80, SD = 1.13	M = 3.41, SD = 1.10	M = 3.39, SD = 1.00	M = 2.93, SD = 1.00	M = 3.66, SD = .82	M = 2.91, SD = 1.06	3.18	B,C,E > D,F,A
Case involves a failure of previous treatment attempts	M = 2.88, SD = 1.17	M = 3.52, SD = 1.10	M = 3.32, SD = 1.03	M = 3.02, SD = .99	M = 4.09, SD = .74	M = 2.55, SD = 1.04	3.23	E > A,B,C,D,F A → E > F
Case involves a potentially serious condition	M = 2.51, SD = 1.28	M = 3.13, SD = 1.35	M = 3.05, SD = 1.33	M = 3.47, SD = 1.21	M = 4.49, SD = .68	M = 1.94, SD = .94	3.10	E > D D > A,B,C,F A → E > F
Case in which the patient seems anxious or demanding	M = 2.28, SD = 1.06	M = 2.83, SD = 1.23	M = 2.70, SD = 1.07	M = 2.26, SD = 1.04	M = 3.22, SD = 1.02	M = 2.72, SD = .99	2.67	E > A,B,C,D,F B,C,E,F > A,D
Case in which the person accompanying the patient seems anxious or demanding	M = 2.06, SD = 1.10	M = 2.62, SD = 1.31	M = 2.40, SD = 1.07	M = 2.19, SD = 1.03	M = 2.93, SD = 1.11	M = 2.36, SD = .94	2.43	E > A,B,C,D,F
Case in which the patient seems distrustful or dissatisfied with the diagnosis or proposed treatment plan	M = 2.26, SD = 1.10	M = 2.84, SD = 1.27	M = 2.60, SD = 1.09	M = 2.19, SD = 1.08	M = 3.93, SD = 1.04	M = 2.31, SD = .97	2.69	E > A,B,C,D,F
Grand Mean	2.58	3.19	3.00	2.74	3.73	2.49		

In a typical week, participants in this study estimated that they informally consulted with a family physician or specialist colleague on average 5.0 times (SD 5.48). There was a statistically significant negative correlation between years in practice and reported likelihood of consulting with a family physician colleague ($r = -.38, p < 0.001$) but no significant correlation between years in practice and reported likelihood of formally ($r = -0.12, p = 0.28$) consulting with a specialist or estimated number of informal consultations made to both family physicians ($r = -.004, p = 0.73$) and specialists informally ($r = -0.06, p = 0.58$).

3.4.4 Perception of Improved Patient Satisfaction and Resources Accessed

To answer the question, "Does the family physician's perception of improved patient satisfaction with care vary as a function of the type of external resource accessed?" data were analyzed using a repeated measures ANOVA with the dependent variable being the estimated percentage of cases in which patient satisfaction is improved with each type of resource accessed (reference manuals, textbooks, or internet sources; asking a family physician colleague; asking a specialist with an informal consultation; referring to a specialist with a formal consultation; referring to an allied health care professional.)

Results indicated a statistically significant difference in physicians' perception that access of a particular resource would improve their patients' satisfaction with care, $F(4,344) = 32.80, MS 10893.6, p < 0.001$, as described in Table 6. Using SAS, these results were analyzed with Student Newman-Keuls post hoc tests to determine which specific type of resource(s) were involved within these significantly different perceptions.

Results indicated that referral to specialists was associated with the greatest perception of improved patient satisfaction with care, significantly greater than with access to any other type of information source. Speaking to a specialist (informal consultation) was next most likely to be perceived as improving patient satisfaction with care. There was no significant difference in perception of improved patient satisfaction with care with

access to reference manuals or textbooks or internet, or with speaking to a family physician colleague or making a referral to an allied health care professional.

Table 6. Physicians' estimates of % of cases in which information obtained from each resource improves patient satisfaction with care

	Mean	SD
Access to reference manuals textbook, or internet sources	46.34	25.28
Consult with family physician colleague	44.06	26.58
Speak to specialist (informal consult)	53.22	26.94
Refer to specialist (formal consult)	71.64	18.20
Refer to allied health care professional	47.53	25.68

3.4.5 PRU Score and Referrals to Specialists

To answer the question, "In clinical situations that provoke uncertainty, do family physicians who experience greater stress from uncertainty (as reflected by a greater PRU score) report greater likelihood to refer patient for specialist consultations?" the following analyses of PRU scores were performed.

PRU score results were assessed for normality. Komogorov-Smirnov and Shapiro-Wilk tests of normality were non-significant ($p > 0.05$ for each) indicating that the data were normally distributed.

The PRU scores were assessed for internal consistency. In keeping with measures of internal consistency provided by the author of the PRU tool in her original papers, Cronbach's alpha was determined for each of the four categories of questions in the PRU. Results suggest acceptable internal consistency of the PRU components: Anxiety due to Uncertainty (five items), Cronbach's alpha 0.90; Concern about Bad Outcomes

(three items), Cronbach's alpha 0.89; Reluctance to Disclose Uncertainty to Patients (five items), Cronbach's alpha 0.72; Reluctance to Disclose Mistakes to Physicians (two items), Cronbach's alpha 0.97.

There was no significant association between PRU scores and reported likelihood of referring the patient for specialist consultation; therefore, the variables associated with PRU were explored further using a multivariate approach. Multiple regression analysis was used to predict PRU score from variables including gender, years in practice, solo or group practice, belonging to a Family Health team or not, average reported likelihood of referral to a specialist, average reported likelihood of consulting with a family physician colleague, estimated percentage of cases in which patient satisfaction with care is improved with referral to a specialist, estimated percentage of cases per week involving a feeling of uncertainty, and estimated number of informal consultations made per week to a family physician colleague or specialist. The PRU score model had an adjusted $R^2 = 0.22$, $F(9,67) = 0.187$, $p = 0.603$. No scores had significant regression weights (Table 7). There were no outliers.

Table 7. Results of multiple regression analysis for PRU score model: significance of predictor variables

Predictor Variable	Standardized Coefficient Beta	<i>p</i>
Gender	-0.85	<i>p</i> = .523
Years in practice	0.22	<i>p</i> = .111
Group or solo	-0.01	<i>p</i> = .972
Practicing in a Family Health Team	-0.13	<i>p</i> = .366
Average reported use of referral to specialist	0.14	<i>p</i> = .302
Average reported use of consulting with a physician colleague	-0.08	<i>p</i> = .594
% cases in which referral to specialist improves patient satisfaction with care	-0.17	<i>p</i> = .203
% of cases involving feeling of uncertainty	-0.16	<i>p</i> = .221
Estimated informal consults per week with family physician colleague or specialist	0.09	<i>p</i> = .479

3.4.6 Referrals to Allied Health Care Professionals in Family Health Teams

Lastly, to answer the question, “Do family physicians who practice in a Family Health Team and those who do not differ in their likelihood to refer to allied health care professionals and in their perception of improved patient satisfaction with their care with these referrals?”, data were analyzed using an Independent-Samples T-Test with grouping variable of practicing in a Family Health Team or not in a Family Health Team, and dependent variables being the estimated improved patient satisfaction with referring to an allied health care professional and average reported likelihood of accessing each of the types of external resources listed in Table 2. As outlined in Table 8, results indicate that compared to physicians not belonging to a Family Health Team, physicians in a Family Health Team reported being more likely to consult with a family physician colleague, $t(79) = 2.55$; $p = 0.013$, and less likely to refer to a specialist, $t(79) =$

2.19, $p = 0.031$. There was no statistically significant difference in their likelihood to refer to an allied health care professional or in their perception of improved patient satisfaction with referral to an allied health care professional, nor was there a statistically significant difference in their reported likelihood to access reference materials or textbooks, internet sources, or informally consult with a specialist.

Table 8. Comparison of physicians in a FHT and not in a FHT in their reported likelihood of referring to AHPs and perception of resulting improved patient satisfaction with care, and in their reported likelihood of accessing various external resources*

AHP = Allied Health care Professional, FHT = Family Health Team

	Practicing in a FHT n = 45	Not practicing in a FHT n = 36	t	p
Average reported likelihood of referring to an AHP	M = 2.65 SD = .78	M = 2.34 SD = .71	1.87	$p = .065$
Estimated % of cases in which referral to an AHP improves patient satisfaction with care	M = 51.82 SD = 22.72	M = 42.86 SD = 27.42	1.59	$p = .116$
Average reported likelihood of accessing reference manuals and textbooks	M = 2.52 SD = 1.01	M = 2.69 SD = 0.93	0.78	$p = 0.437$
Average reported likelihood of accessing internet sources	M = 3.73 SD = 0.81	M = 2.98 SD = 0.98	1.98	$p = 0.052$
Average reported likelihood of consultation with a family physician colleague	M = 3.24 SD = 0.77	M = 2.76 SD = 0.94	2.55	$p = 0.013$
Average reported likelihood of informal consultation with a specialist	M = 2.80 S.D = 0.85	M = 2.71 SD = 0.83	0.44	$p = 0.658$
Average reported likelihood of referral to a specialist (formal consultation)	M = 3.63 SD = 0.66	M = 3.93 SD = 0.53	2.19	$p = 0.031$

* reference manuals or textbooks, internet sources, consultation with family physician colleagues, informal specialist consultation, and referral to specialists.

3.4.7 Qualitative Analysis of Comments

In the quantitative survey, the following request was made: "Please record any comments that you might have about how you deal with uncertainty in clinical practice and/or access external resources in helping you to deal with that uncertainty."

Participants provided many comments. Generally, the themes related to a reduction in uncertainty experienced as well as greater understanding and acceptance of uncertainty with increasing practice experience. In addition, physicians described various strategies used to help manage their uncertainty.

Major themes included the following:

1. As practice experience increases, physician uncertainty decreases.

Physicians noted that the feeling of uncertainty appears most prominent in early practice years but with increasing practice experience, physicians appear to become less uncertain.

- *"uncertainty was much worse first 2-3 years of practice, improving now after 5, but still plenty ... part of the fun and challenge of varied practice."* (5 years practice experience)
- *"I have been in practice 25 years and have seen a lot. I recently have entered a teaching scenario with associates who are much younger than myself; I am amazed at how often I am consulted informally with very logical things. My point: clearly experience decreases uncertainty."* (25 years practice experience)

2. As practice experience increases, physicians develop an acceptance of uncertainty as inherent in the nature of primary care practice.

Several physicians commented on an eventual understanding and acceptance that uncertainty is an inevitable part of primary care practice. Developing a tolerance of uncertainty appears to be important for family physicians.

- *“uncertainty is a reality in practice and life in general so it needs to be accepted as part of the continuum of daily activity and anxiety.”* (35 years practice experience)
- *“uncertainty is the job. We can never be sure, you do the best with the information you have. To be a [family physician] you have to live with uncertainty.”* (32 years practice experience)
- *“Family physicians should embrace uncertainty. It defines the challenges of our specialty. It is a key difference between us and our specialist colleagues.”* (28 years practice experience)

3. There appears to be a recognition of different sources of uncertainty experienced: uncertainty due to limitation in one’s own knowledge, and uncertainty due to limitations in knowledge of the practice of medicine.

- *“There is a difference between uncertainty if I feel I should know something and don't and the uncertainty that is created because there is no answer. Even texts internet and colleagues can't give answers where there are none. Years of experience make you more comfortable with uncertainty to a point then doubt about your knowledge base makes uncertainty more concerning.”* (35 years practice experience)

- *“The main thing is knowing what you know, knowing what you don't know and then looking/asking for help.” (23 years practice experience)*

4. Physicians used various strategies to help them cope with uncertainty experienced during patient encounters. These included the separation of cases in which a diagnosis was urgently needed versus those in which a diagnosis was not urgent, and the sharing of uncertainty with patients.

Physicians described distinguishing between cases in which a diagnosis was urgently needed and cases that could be managed with a “watchful waiting” strategy, referring to careful observation over time as the condition evolved and the diagnosis became clearer. Those cases in need of urgent diagnosis were perceived as involving potentially serious conditions. However, most cases were felt to be of a non-serious nature and could be managed with a watchful waiting strategy.

- *“dealing with uncertainty depends on the nature of the problem. If I feel there is significant “disease” then I handle it differently than if there it just ‘unwellness’”. (35 years practice experience)*
- *“Most uncertainty is not anxiety provoking as one can usually categorize the presentation as potentially serious or not.” (28 years practice experience)*
- *“I think uncertainty in [family practice] is part of the job. Many things are uncertain but trivial clinically. I just have to be sure that it is true over time. Only rarely is this an urgent necessity to know immediately.” (35 years practice experience)*

One physician described using the level of anxiety generated by the uncertainty of the case as a “barometer” of how the patient should be managed.

- *“If I am anxious about a clinically uncertain situation I use that as a barometer that I need to change my management right then - in uncertain situations I rule out serious conditions, make sure I educate patients about my 'worst case scenario' and what to do if... and then I am not anxious anymore. Reliable patients get more directions, often written, less reliable patients get closer follow up.”* (15 years practice experience)

For cases in which a diagnosis was not urgently needed, a strategy of observing and following the patient carefully over time was often described. Physicians noted the importance of ongoing reassessment of the situation.

- *“most uncertainty cases are not of a serious nature so I don't worry about it too much and just recall the patient back or ask them to follow up to see how the condition unravels itself as the diagnosis may become certain with time.”* (20 years practice experience)
- *“Watchful waiting is often the right course.”* (25 years practice experience)
- *“Time is usually the great answer to diagnostic uncertainty.”* (15 years practice experience)

Several physicians described ways of acknowledging and accepting that the diagnosis will not be known in every case.

- *"I find it very helpful to write NYD (not yet diagnosed) in my assessment plan and tell the person that we must follow-up in order to establish a diagnosis."* (20 years practice experience)
- *"Keep thinking. Give yourself permission to not know initially but to find ways to find out!"* (22 years practice experience)

Sharing of uncertainty with patients was described as a strategy physicians used to cope with uncertainty. However, there was disagreement among participants about patients' willingness to accept uncertainty and how it impacts upon their perceptions of their physician. Some noted that patients may be uncomfortable with uncertainty and that the method in which the uncertainty was disclosed was significant. It was important that the patient be informed of the uncertainty but not feel abandoned or have reduced confidence in the physician. This was facilitated by providing a plan of investigations, patient instructions and follow-up visits, and sometimes, access to internet sources or referral to specialists.

- *"I think I am more comfortable with uncertainty than my patients are. I sense that most patients want a clear cut answer as to what is wrong and how to fix it. Even if I am comfortable with uncertainty, their discomfort affects my ability to be "ok" with it."* (9 years practice experience)
- *"I find that patients are quite understanding of physician uncertainty and are appreciative if you explain that there is uncertainty as long as you have a plan in place to manage the uncertainty. For example: "I'm going to order this test, but if it isn't helpful, then we'll do a Ct scan or get a specialist consult, etc. " It is important that the patient knows that you will not abandon them to the uncertainty; instead you will pursue the uncertainty."* (24 years practice experience)

- *“Being open with patient often helpful - often its "I'm not sure exactly what that is, but it doesn't have appearance of being worrisome because ... IF X,Y Z happens - those are worrisome symptoms and you need to be reassessed. If anything else changes or it persists, again let me reassess you. Often this is satisfactory to many patients.” (26 years practice experience)*
- *“... there is often uncertainty which is best managed by informing the patient of the concerns, the possible outcomes and worry features to watch for. If one informs them of the potential issues and when they need to return, then one is practicing safe medicine, improving patient confidence and reducing risk of litigation. By explaining a number of outcomes, one demonstrates one's knowledge, thus improving confidence of the patient, even if one does not actually know the answer at the time.” (8 years practice experience)*

Physicians acknowledged that access to external resources such as internet sources or referrals to specialists were sometimes used to alleviate the patient's discomfort with uncertainty.

- *I have found having access to computers in the patient care setting very valuable: Sometimes I will pull up a valid resource for a patient, explain things to them, then leave them to read further themselves, while I may go to attend to another patient. I can then return to the patient and answer further questions they have. Then I know they have consulted a valid resource, and they have had time to mull over other questions they may have.” (21 years practice experience)*
- *“often patients need to hear same thing from a specialist that they've already heard from me. If I refer them a few times and they get the same response I*

gave, then they are more likely to trust what I say in the future.” (3 years practice experience)

5. Access to internet sources, family physician colleagues, and specialists helped to reduce the physician’s discomfort with uncertainty; however, likelihood of accessing an external resource appeared heavily dependent on accessibility of that resource.

Participants described internet sources and consultation with specialists (formal or informal) as being particularly valuable when feeling uncertain about a clinical case, but access to informal consultation with specialists was often constrained by factors such as inconvenience or lack of existing relationships with specialists. Several described systemic problems in accessing specialists due to family physicians’ reduced roles in hospitals. Others praised the value of working in teams of family physicians which allowed easy access to colleagues with whom they could discuss difficult cases. Others noted that their use of internet resources was dependent on accessibility.

- *“I really miss the informal consultations that used to take place when family doctors went to the hospital. I knew all the specialists and they knew me and it didn't seem like a big deal to say what do they think about this EKG, or what would they do in a certain situation. Now to get that same advice involves calling, interrupting them in their office or having them call back and interrupting my office -- it's much more of an intrusion and I rarely do it. It occurs to me that it would be a great thing to do over the internet as responses could be made and retrieved when one is not with a patient.” (27 years practice experience)*
- *“It is particularly anxiety provoking when it appears serious and no appropriate specialist is available or it is unclear who to consult.” (28 years practice experience)*

- *“I work in a large (8) group practice which fosters clinical corridor consults of each other - tremendously eases my uncertainty.”* (4 years practice experience)

Many participants described access to the internet as an invaluable resource with value residing in accessibility and up-to-date nature of the knowledge provided. Some, however, felt consultation with peers to be “infinitely superior.”

- *“internet has greatly improved my dealing with uncertainty.”* (7 years practice experience)
- *“I have not opened a textbook in 10 years, everything is online, it is much better and more current.”* (23 years practice experience)
- *“Communicating with colleagues is for me an infinitely superior tool for dealing with uncertainty as compared to textbooks, internet, etc.”* (40 years practice experience)
- *“virtually always will discuss with family medicine colleagues for “brainstorming” and/or reassurance.”* (12 years practice experience)

3.5 DISCUSSION

3.5.1 Situational Cues and Use of External Resources

Of the clinical situations described in the qualitative study as provoking feelings of uncertainty (Table 1), this study found that physicians felt most likely to access an external resource in cases that involved an unfamiliar condition. This comparison is outlined in Table 4. While previous research has been directed at identifying the types

and frequency of clinical questions most likely to arise in primary care^{25,34,35} as well as factors motivating the pursuit of answers to clinical questions^{25,26}, none have specifically addressed the relationship between clinical situation characteristics and type of resource accessed. This study therefore provides new information on the influence of situational cues on physicians' use of external resources.

In cases involving failure of previous treatment attempts, or when patients or persons accompanying patients seemed anxious, demanding, distrustful or dissatisfied with the diagnosis or proposed treatment plan, physicians reported a statistically significant greater likelihood to refer to a specialist over use of any other type of resource. The difficulty in managing these types of clinical encounters has been well described in the literature, these being amongst the one-sixth of patient encounters in primary care that have been labelled as "difficult."^{47,48} These types of encounters have been found to involve a high degree of physician emotional reaction⁴⁹ and are amongst the most frustrating for physicians,⁵⁰ although individual physician character traits may influence the degree of difficulty perceived to be involved with any encounter.^{51,52, 53,54,55}

Other studies have demonstrated the existence of significant social influences on clinical decision-making.^{56,57(p 174),58,59} On physicians' decisions to refer to specialists, both medical and non-medical influences have been described; important social factors include the patient's request for referral,⁶⁰ a desire to foster patient trust and satisfaction with care,⁶¹ and need for reassurance of the patient or family and enhancement of patient trust in the physician's medical judgment.¹ Perception of patient pressure for referral has been associated with increased likelihood of referral to specialists. Patient visits involving unexplained medical symptoms, particularly those with greater degree of symptom elaboration and intractable symptoms, are associated with increased perception of patient pressure and physician sense of powerlessness⁴¹ and more investigative tests and specialist referrals. Such influences may underlie the finding in this study that physicians reported greater likelihood to refer to specialists

when patients or persons accompanying patients were perceived as anxious, demanding, distrustful or dissatisfied.

Overall, when faced with the clinical situations presented, physicians in this study felt most likely to access formal specialist consultations as compared to use of other types of external resources described in Table 2. Referral to specialists was associated with the greatest perception by physicians of improved patient satisfaction with care, significantly greater than with access to any other type of resource. Thus, in difficult patient encounters, particularly those in which physicians perceive that patients or persons accompanying patients seem anxious, demanding, distrustful or dissatisfied with the diagnosis or proposed treatment plan, physicians may be more likely to refer to specialists because this option may provide the greatest patient satisfaction with care provided – and least regret or chagrin - as compared to utilization of any other resource. Bell's "regret theory"^{62,63}, or Feinstein's "chagrin factor"⁶⁴ suggest that physicians' decisions are based on choosing the option whose wrong result will result in the least regret or chagrin. Other qualitative studies have confirmed the process of weighing positive and negative factors in physicians' decisions to refer.^{65,66}

In the present study, several physicians acknowledged that referrals to specialists were sometimes motivated by the patient's need for reassurance. One commented on the need for patients to hear the same thing from the specialist as they hear from the family physician in order to build trust and confidence in their family physician's care. Such perceptions may be accurate; a study has demonstrated that patients report low trust, confidence, and satisfaction with their primary care physician if they perceive a need for referral but have difficulty obtaining this. Perceived patient pressure for referral has been found to be a strong independent predictor of referral behaviours. In one study, 84.7% of patient referral expectations were fulfilled,⁵ and it has been demonstrated that one fifth of referral decisions are influenced by a patient's request for referral.

In cases involving potentially serious conditions, physicians reported a statistically significant greater likelihood of referring to a specialist (formal consultation) over access to any other type of resource. They were next most likely to speak to a specialist (informal consultation). The preference for use of specialist consultation as a resource in this situation may reflect the urgent need for accurate information that is specific and directly applicable to the patient being seen. Such patient-specific information may not be as easily accessed through other types of information resources.^{67,68} For example, excessive amounts of information to scan and lack of specificity of available information have been described as barriers to use of internet sources in clinical practice. A 2006 study demonstrated that while access to internet information facilitated overall reflection on practice, physicians did not use this access in a just-in-time manner for immediately solving difficult patient problems but instead continued to rely on consultation with colleagues.³⁷ Literature suggests that the most common obstacles to direct pursuit of answers to clinical questions are physician's doubt that an answer exists, ready availability of consultants leading to a referral rather than a search, and lack of time.⁶⁹ This present thesis study suggests that specialist resources continue to remain most important to the family physician when accurate contextualized knowledge is required urgently, such as when dealing with potentially serious clinical conditions.

In all seven situations, physicians reported a statistically significant greater likelihood of referring to specialists (formal consultation) as compared to speaking to a specialist (informal consultation). Previous studies on resources accessed by family physicians have generally not distinguished between formal and informal consultations made to specialists. A plausible explanation for greater tendency to consult formally rather than informally includes lack of time required to speak to a specialist throughout a busy clinic day whereas arranging a referral through office staff may be more expedient. Another factor may be lack of accessibility to specialists with whom a comfortable informal relationship has been established. One physician commented on the current inconvenience to both family physician and specialist in attempting to speak to a

specialist about a case, whereas in former years when family physicians routinely worked in hospitals, relationships with specialists were established and informal consultations were much easier to access. Several physicians commented on the importance of good relationships with specialists in dealing with uncertainty. As one physician noted, *"It is particularly anxiety provoking when it appears serious and no appropriate specialist is available or it is unclear who to consult."* Thus, greater likelihood to formally consult rather than informally consult with specialists might reflect current systematic practice constraints and lack of close relationships with specialists rather than actual family physicians' preferences.

In a typical week, physicians in this study estimated that they spoke to a family physician or specialist colleague (informal consultation) on average 5.0 times. If an informal consultation was made in a case that appeared potentially serious, physicians reported greater likelihood of speaking to a specialist rather than to a family physician colleague. This may reflect the need for urgent, accurate information about a specific problem that may be more likely obtained by speaking to a specialist who may have greater experience and knowledge regarding a particular problem, as compared to a family physician colleague. However, in all other situations, physicians reported significantly greater likelihood of informally consulting with a family physician colleague as compared to informally consulting with a specialist. The value of consulting with family physician colleagues was emphasized in the comments provided by the participants. In dealing with uncertainty, support and reassurance of a more experienced peer seemed particularly valuable to physicians with less practice experience. Several described the consultations with family physician colleagues as being facilitated by group practice structure and being very helpful in reducing the discomfort of uncertainty. Indeed, this study found that physicians belonging to a Family Health Team (which encourages group practice structure) were significantly more likely to consult with their family physician colleagues than those who did not belong to a Family Health Team. Being more likely to

be co-located with other physicians may facilitate “corridor consultations” amongst colleagues within Family Health Teams.

It is notable that while physicians estimated that they informally consulted with a family physician or specialist on average 5 times per week, there was a wide range of responses as reflected in the standard deviation of 5.48. An explanation of the variation in response may be that physicians are not actually aware of the degree to which they need to consult with their colleagues. Covell et al.⁷⁰ concluded similarly in their study using two methods to study physician access to resources; in that study, physicians significantly under-represented their frequency of consultation with colleagues on a questionnaire as compared to their actual use of colleagues as a resource.

Previous studies have demonstrated the importance of consultation with colleagues as one of the two most frequently accessed sources of information for family physicians.^{26,31,32,71,72} A 1990 survey of US primary care physicians cited consultation with colleagues as a resource relied upon about every other day.³¹ Literature suggests that the physicians’ need to frequently consult with colleagues may be reflective of special needs that otherwise cannot be met: a psychological need for support, guidance and reassurance of what they are doing, as well as the need for tacit knowledge which embodies the experiential knowledge of another individual.^{26,68,73,74,75} Bosk describes the seeking of opinions of colleagues as helping to mitigate the feeling of uncertainty by removing personal stigma from uncertainty (if a trusted colleague cannot provide an answer, no one can) and transferring some of the responsibility of the problem to the colleague.⁷⁶ This might explain the present study’s findings that physicians belonging to a Family Health Team were significantly more likely to consult with their family physician colleagues and less likely to refer to specialists than those who did not belong to a Family Health Team. Perhaps in some cases, the physicians’ discomfort of uncertainty may be alleviated by the support and reassurance provided by consulting with a colleague such that reliance on specialists’ referrals for this particular need may

be reduced. If so, this may have significant implications in terms of health resource utilization and provides an important area of further research, measuring actual numbers of referrals made rather than physicians' reported likelihood of referrals to specialists.

There was a statistically significant negative correlation between years in practice and reported likelihood of consulting with a family physician colleague. In their comments, several participants described how less experienced physicians tended to rely on consultation with more experienced peers in dealing with cases in which they felt uncertain. Physicians' uncertainty generally seemed to decrease with increasing practice experience. However, there was no significant correlation between years in practice and reported likelihood of informally or formally consulting with a specialist or estimated number of informal consultations overall made per week. This is consistent with findings in the literature suggesting that while the threshold for referral varies significantly between physicians,^{3,77} for each individual physician it appears to be a relatively stable practice trait over time with one study demonstrating a high year-to-year case mix-adjusted referral rate correlation of 0.90.⁷⁸ A plausible explanation might be that physicians with less experience may require more support and guidance but may feel more comfortable obtaining this from family physician colleagues rather than specialists. The lack of correlation between years in practice and reported likelihood of informally or formally consulting with a specialist may reflect changing reasons underlying the need for specialist consultation as the family physician gains greater practice experience.

Lower numbers of referrals made to specialists do not necessarily indicate appropriateness of that practice. Greater competency with increasing experience may lead to improved diagnostic acumen and greater awareness of the need to appropriately refer. Physicians' certainty of the diagnosis has in fact been shown to increase the decision to refer. It has been suggested that practitioners who refer more

frequently may do so because of increased knowledge and diagnostic acumen in a particular area, rather than consulting excessively because of lack of knowledge or skills. Thus, the overall numbers of referrals may not decrease with increasing practice experience because as the physician develops greater diagnostic acumen and competency, those initial referrals due to lack of knowledge may be replaced with greater numbers of appropriate referrals.

Physicians commented on access to internet sources as being helpful in managing their own discomfort with uncertainty as well as that of their patients. Of the clinical situations presented, participants reported being most likely to use internet resources when faced with conditions that seemed unfamiliar, and least likely to use internet resources in a potentially serious case, when the patient or accompanying person seemed anxious or demanding, or when the patient seemed distrustful. This may reflect use of internet resources for questions of a more general nature rather than for specific answers required when feeling pressured or needing urgent, accurate answers. A previous study found that only one-fifth of complex questions and less than half of general management questions could be answered by searching internet resources. This may also reflect significant time barriers as it takes time to find information from internet sources.

In the literature, reported significant barriers to using internet resources include excessive time required to find information, lack of good sources of information, uncertainty as to whether all relevant information has been found, and inability to synthesize the pieces of evidence into a clinically useful approach. When urgent information that is specific to a case is required, such as when a condition is potentially serious or there is significant patient pressure for an accurate answer, physicians may find that the usefulness of the information obtained from internet resources does not justify the effort required to obtain that information. This is consistent with Shaughnessy's model of information seeking⁴⁰ and Connelly's cost-utility model³¹ in

which the decision to seek additional knowledge was seen as a compromise between the conflicting goals of a need for more information that reduces uncertainty, and a resistance to time or effort expenditures. As well, it supports previous findings of the urgency of the patient's problem and the physician's belief that a definitive answer exists as being the most significant predictors of whether answers to clinical questions are pursued.

Thus, internet resources may be preferred when general information is required on a non-urgent basis, such as when dealing with a condition that seems unfamiliar to the physician but is of a non-serious nature. Several participants commented on how most diagnostic questions in family practice do not require an urgent answer due to the nature of primary care where conditions slowly evolve over time.

This study showed no significant association between reported likelihood of using internet resources and physician or practice characteristics such as age, gender, years in practice, group or solo practice, or whether they practiced within a Family Health Team. This contrasts the findings of a large U.S. survey in 2005 that suggested that younger physicians and female physicians were more likely to use the internet to seek information on a particular problem. Perhaps this can be explained by sample selection. Bennett et al. sent a questionnaire by facsimile to a randomly selected sample of US physicians of all specialties in active practice and therefore, respondents may or may not have been familiar with internet use. The invitation to participate in the present study was sent to family physicians via e-mail so our participants may have been more familiar with internet use and internet resources. Thus, recruitment bias might have prevented the detection of demographic or practice differences amongst participants who are more or less likely to use internet resources.

In the present study, family physicians reported a statistically significant greater likelihood of using internet resources over print reference materials and textbooks in

each of the seven situations identified. This differs from findings of several recently published studies. In Davies' systematic review of medical information-seeking literature between 1996 and 2006, the two most frequently accessed information sources were text books (39%) and 'humans' (25%); computer resources were accessed on average in 13% but Davies noted a higher percentage of use in later published studies. Other studies have similarly found print reference materials and colleagues to be the two most frequently accessed information sources by family physicians.^{31,32,35,38,79} Again, method of recruitment might explain the discrepancy in these findings in that physicians invited to participate in the present study might have been more familiar with internet use and internet resources than the average practicing community family physician. Alternative plausible explanations include increased physician familiarity with internet use and increased number of useful internet resources over the past three years, or that physicians in the present study may have overestimated their use of internet resources relative to print reference materials. It is notable that the Gonzalez-Gonzalez study used an observational method in their study design rather than physicians' self-report which is a limitation in the present study. However, based on the comments of several participants, at least for the physicians in this study who may have good familiarity with internet use, internet sources appear to be a very important resource in managing clinical uncertainty and a preferred resource relative to use of print reference materials and textbooks.

3.5.2 Allied Health Care Professionals as a Resource

In the present study, physicians who practice in Family Health Teams did not significantly differ from those not in Family Health teams in their reported likelihood to refer to allied health care professionals or in their perceptions of improved patient satisfaction with care with these referrals. Perhaps this reflects the newness of the Family Health Team structure in Ontario. Family Health Teams are a key component of Ontario's primary health care renewal strategy. A Family Health Team is designed to

bring together inter-professional health care providers who work collaboratively in primary care, each utilizing their experiences and skills, to provide coordinated, comprehensive care for patients.⁸⁰ Implementation of Family Health Teams has been a gradual process over 3 “waves” since 2005; to date, 150 Family Health Teams have been created in Ontario and 50 more are planned. Many teams may not yet have established roles for their allied health care professionals or protocols for referral, and physicians may not have had enough experience with these referrals and patient feedback to change their perceptions of patient satisfaction.

Theoretically, close associations between physicians and allied health care professionals within a Family Health Team and a funding structure which eliminates direct financial cost to patients to access these services should facilitate greater access to allied health care professionals as a resource in patient care. However, in a search performed by the Canadian Library of Family Medicine using Medline, Scopus, and CBCA Reference databases, there appears to have been no published literature that directly addresses the utilization of allied health care professionals within Family Health Teams as compared to other models of primary care.

It is also probable that effective collaborative practice in health teams is influenced by many factors other than affiliation with a particular Family Health Team and working together in close physical proximity. Studies have demonstrated the importance of social, cultural, educational and organizational determinants of collaborative practice in health teams. For example, existence of power differentials, cultural affinity for autonomy, poor communication, or limited knowledge of the practices, expertise, and skills of professionals in other disciplines can be factors that hinder the development of collaborative practice.⁸¹

3.5.3 Experience and Physicians' Reactions to Uncertainty

The present study found no significant relationship between physicians' reactions to uncertainty as measured by the PRU score and number of years in clinical practice. Yet many physicians in this study described the amount of uncertainty experienced as decreasing with greater years in clinical practice and the development of a tolerance to uncertainty. A plausible explanation for our finding of no relationship between physicians' PRU score and number of years in clinical practice may be that differences that occur very early in the practice career may not have been captured in our sample of physicians as it included just 5 participants with less than 5 years of practice experience. A population-based Swiss study involving 1,184 physicians of various disciplines found that reactions to uncertainty were highest for recently graduated physicians and lowest for those who had established private practice for 5 years or more; beyond that point, PRU scores remained stable. Other studies have found significantly higher PRU scores in trainees relative to practicing physicians.^{15,19} Given that participants in our study had, on average, 20.3 years of clinical practice experience, our study may have been limited in the ability to detect changes in PRU scores that may occur during the first few years of practice. However, this explanation remains speculative and requires further study.

In this study it was hypothesized that family physicians who experienced greater reactions to uncertainty (as reflected by a greater PRU score) would be more likely to refer the patient for specialist consultation. This study found no relationship between PRU score and likelihood of referring to specialists. A possible explanation may be that physicians' reactions to uncertainty do not actually influence the behavioural response of making a referral to a specialist. A second explanation may involve limitations of the instrument used in this study: as a measure of uncertainty, the PRU may be limited to the narrow construct of physicians' reactions to uncertainty and not directed at other constructs such as overall amount of uncertainty experienced that might be more influential in physician practicing behaviour. A third explanation may relate to

insufficient variability in PRU scores to demonstrate a relationship as a result of the lack of high scores associated with new graduates who were not well represented in our sample of physicians.

While likelihood to refer to specialists did not appear to change with increasing practice experience, this study found a statistically significant negative correlation between years in practice and reported likelihood of consulting with a family physician colleague. This is supported by several participants' comments that less experienced physicians tended to rely on consultation with more experienced peers in dealing with cases in which they felt uncertain. Experienced physicians also commented on the importance of developing a tolerance for uncertainty and the recognition and acceptance of uncertainty as being an inherent part of primary care practice. It is possible that the concept of uncertainty may represent qualitatively different experiences through different stages in a physician's practicing career. Perhaps the uncertainty experience described early in practice reflects a sense of deficiency in one's own personal knowledge base, consistent with Fox's observations that a common reaction to uncertainty amongst medical students was a sense of personal inadequacy⁸², whereas with greater practice experience the acknowledgement of uncertainty reflects an understanding of the nature of primary care practice where symptom complexes are evolving and disease may not yet be identifiable, as well as a recognition of the limits of knowledge in the practice of medicine. The PRU score may not discriminate between these qualitatively different experiences of uncertainty that physicians may experience at different stages of their practicing career. Feelings of personal inadequacy may contribute significantly to the uncertainty experienced in early practice years and could explain higher PRU scores found in trainees relative to practicing physicians^{15,19} and higher PRU scores in recently graduated physicians as compared to those with 5 or more years of clinical practice experience. Further research is required to determine the relative contributions of the different sources of uncertainty to the PRU score and to the experience of uncertainty in physicians.

3.5.4 Physicians' Reactions to Uncertainty and Effect on Patient Management

In the present study, physicians who experienced greater reactions to uncertainty (as measured by higher PRU scores) did not report greater likelihood to refer patients to specialists for consultation or informally consult with specialists or family physician colleagues. Physicians with a higher PRU score did not report a significantly higher estimated percentage of cases per week involving a feeling of uncertainty. There are several possible explanations for this. Physicians' decision to refer to specialists may be primarily driven by the characteristics of the case such as seriousness and urgency of the condition or perceived patient pressure for referral, such as when patients or family members seem particularly anxious or demanding or distrustful rather than physicians' own comfort with uncertainty. This explanation is supported by this study's findings that physicians reported significantly increased likelihood to refer to specialists in these types of clinical encounters as compared to their use of other resources. Although speculative, perhaps situational factors may have more impact than the personal characteristics of the physician in their decision to refer to specialists. Alternatively, physicians' own internal sense of angst may be less influential in the decision to refer. Whereas literature suggests higher anxiety due to uncertainty is associated with lower work satisfaction amongst physicians¹⁶ and higher levels of burnout, this may not necessarily translate into effect on physician behavior in patient management. It is also possible that physicians may have been inaccurate in their estimates and self-reported tendencies; what they say they do and what they actually do may differ.

Carney's studies of radiologists found that higher anxiety due to uncertainty (as measured by a modified PRU scale) was associated with higher perception of risk of being sued¹⁷ and with mammography reporting that had higher recall rates and lower positive predictive value. Allison et al. found that amongst internists, increase in Anxiety Due to Uncertainty and Reluctance to Disclose Uncertainty to Patients corresponded to significant increase in HMO resource use based on patient expenditures that included referral to specialists, laboratory and radiology charges.

However, amongst primary care physicians, several studies have not demonstrated an association between PRU scores and effect on referrals to specialists and this is consistent with the present study's findings. Franks et al., Bachman et al., and Forrest et al. found little to no association between likelihood of referral and Anxiety Due to Uncertainty and Concern about Bad Outcomes subscales of the PRU.^{2,23,24} Forrest et al., found small effects of Reluctance to Disclose Uncertainty subscores on referral rates, but Bachman et al., found no effect of these subscores. The present study was conducted on the basis that methodological design may have influenced results of previous research involving primary care physicians. For example, external pressure to control health care resource expenditures may have affected patient referral rates among American physicians in an HMO funding structure, thereby influencing results. Achieving similar results among Canadian physicians of no association between PRU score and referral rates to specialists suggests a need for other explanations.

One plausible explanation for this discrepancy in relationship between PRU scores and tendency to refer may be that family physicians perceive less anxiety in response to uncertainty than do specialists such that it does not influence their behavior. This explanation is supported by the conclusions of Fiscella, et al., whose study found that family physicians had significantly less anxiety generated by uncertainty and less risk aversion than did primary care internists as measured by several psychometric tests including the Anxiety Due to Uncertainty subscale of the PRU. In that study, family physicians generated 5% less overall costs per patient than general internists; regression analysis suggested that interspecialty differences in costs were related to greater risk aversion of the internists. PRU scores have been demonstrated to vary between different specialties; for example, radiologists appear to have greater reactions to uncertainty than do primary care internists.^{15,16,83} It is therefore plausible that compared to specialists, family physicians' practice behaviours may be less affected by situations of uncertainty because they perceive less anxiety in response to that uncertainty.

A second explanation may be that family physicians react differently to the uncertainty they perceive than do specialists. Primary care inherently involves a greater degree of uncertainty as many conditions present in evolution, without identifiable disease categorization. Secondary care provided by specialists involves care that is largely short-term and consultative in nature⁸⁴ for patients who may be referred by primary care physicians after their condition has evolved to a sufficient degree to allow for disease differentiation. Family physicians may learn to manage this uncertainty in ways that differ from specialists. With the nature of family practice allowing for continuity of care, family physicians can closely follow patients over time as the condition evolves and as disease distinction becomes clearer. In the present study, several family physicians described a strategy of “watchful waiting” as being helpful in managing cases of uncertainty. Specialists such as radiologists may not have this luxury and therefore may need to manage uncertainty in different ways. As Carney et al., postulate, radiologists may be less likely than physicians in other disciplines to have the longitudinal face-to-face relationships with patients that might help to make their reactions to uncertainty less stressful.

In this study, no relationship was found between PRU score and gender. In a review of studies reporting gender differences in physician PRU scores, some have reported scores to be higher in women,^{15,16} higher in men, or differences that exist for some PRU subscales but not others.²² This study also found no relationship between PRU score and physician or practice characteristics such as years in practice, solo or group practice, or belonging to a Family Health team or not.

It is recognized that the focus of this thesis study on the likelihood to refer to specialists represents just one possible physician behavioural response. There may be other practice behaviours not addressed in this study that may better relate to physicians’

reactions to uncertainty, such as the likelihood to access more than one form of external resource prior to forming a clinical decision. This is an area for further research.

3.5.5 Managing Uncertainty in Primary Care

Many physicians commented that dealing with uncertainty was an important part of family practice, and this is supported in the literature. With illness presentations often involving a complex mixture of physical, psychological, and social elements^{57(p 129)}, studies have found that no disease-specific diagnosis is possible in 13 to 19 percent of patient visits to family physicians.^{85,86} One large study demonstrated that in an outpatient clinic, for certain presenting symptoms such as fatigue, dizziness, headache, back pain, chest pain, and abdominal pain, an identifiable organic cause for the symptom was found in just 16% of cases.⁸⁷ Thus, developing strategies for managing uncertainty appears to be an important part of the role of the family physician.

Literature suggests that decisions that need to be made by primary care physicians differ from those made at a secondary or tertiary care level in that precise diagnostic labels are often less important than the decisions about the appropriate course of action^{57 (p 149),88, 89}. Indeed, participants in this study commented on distinguishing between cases that required urgent management and those that did not as a strategy for handling cases of uncertainty.

There is little literature available on how physicians actually distinguish between cases that appear serious and require urgent management and those that appear less urgent. In a qualitative study by Stolper et al., general practitioners described the use of an intuitive, "gut feel" sense that acted as a compass in situations of uncertainty in providing a sense of reassurance about the case when the diagnosis was unclear, or a sense of alarm that something is wrong even though objective evidence was lacking.⁹⁰ One participant in the present study commented on being attuned to her feelings of

anxiety generated by the uncertainty as a useful “barometer” in determining the seriousness of the case and helping to guide management. Various authors in the literature have referred to the concept of “intuition,” “gut feel,” and “sixth sense” as a distinct influence on decision-making that is used by experienced practitioners in situations of uncertainty.^{91,92(pp 126-127),93,94} There appears to be a strong link between intuitive perceptions and past experience.⁹⁵ It is currently felt that this intuitive, gut feel sense may represent pattern recognition at an unconscious level, a form of nonanalytic reasoning.⁹⁶

Indeed, much of clinical reasoning may involve unconscious, non-analytic processes. Other types of knowledge and processes that are largely unconscious may influence clinical reasoning. “Tacit knowledge” is described as a very different kind of knowledge than the formal, analytical representations of knowledge; it underlies explicit knowledge but, being tacit, is difficult for clinicians to verbalize.⁹⁷ Tsoukas describes tacit knowledge as “a set of particulars of which we are subsidiarily aware as we focus on something else.”⁹⁸ Several types of tacit knowledge have been described in the literature including self-regulatory knowledge such as habits of planning and checking, or drawing back and taking stock of a difficult situation, and metacognition, referring to knowledge that controls the application of other knowledge.^{99(pp 158-159)} Such tacit knowledge may help the physician recognize when encounters are not proceeding as expected and the need to “stop and think” in a problematic clinical situation; as well, this knowledge may provide guidance in determining urgency of management in a case when the diagnosis is uncertain.

Several physicians’ comments such as, “Only rarely is this an urgent necessity to know immediately,” and “Time is usually the great answer to diagnostic uncertainty,” suggest that family physicians felt that in most cases, answers to their diagnostic questions were not urgently required. This is supported by findings in the literature that most questions generated in clinical practice are not immediately pursued^{33,34,35,71,100} and that the

perceived urgency of the patient's problem was one of the most significant predictors of physicians' decision to pursue answers to their clinical questions.^{65,66}

However, the process of how actually physicians determine which cases of diagnostic uncertainty require an urgent answer and which do not is an area of important further study because an incorrect determination may have serious implications for the patient. A recent systematic review found that common characteristics of diseases associated with diagnostic delay or error in family practice involved patients with atypical presentations, non-specific presentations, conditions with low prevalence, or presence of co-morbidity.¹⁰¹ Given that cancers, myocardial infarction, and meningitis were amongst the more frequent conditions involved, missed or delayed diagnosis could have serious consequences for the patient. Other studies have suggested that delayed or missed diagnoses are most likely in specialties with cases involving the greatest degree of diagnostic uncertainty, those being internal, family, and emergency medicine.¹⁰² Studying the situational cues that allow for the distinction between cases of diagnostic uncertainty requiring urgent attention and those that do not may provide further valuable information because these processes may involve knowledge that is largely tacit and therefore, difficult for physicians to verbalize.

Sharing the uncertainty with patients was frequently cited by participants as a strategy used to deal with uncertainty. Although literature suggests that patient satisfaction is inversely correlated to the patient's perception of uncertainty in the physician, the manner in which the uncertainty is disclosed and then resolved by the physician appears to be important. If the physician is calm, reassuring, empathic, and appears untroubled in the face of uncertainty, patient satisfaction may not be diminished.¹⁰³ In the present study, comments offered by participants emphasized the importance of disclosing uncertainty to patients. These are remarkably distinct from the writings of Katz in 1984 in which he described a denial of awareness of uncertainty and a donning of "a mask of infallibility" that physicians used to maintain professional control, resulting in a

reluctance to disclose uncertainty to patients.¹⁰⁴ Similarly, earlier studies have demonstrated that physicians infrequently share concerns about treatment uncertainty with patients.¹⁰⁵ Explanations for the current study findings may include a shift in the physician-patient relationship from a paternalistic model (in which the physician determines what is best with limited patient participation) to models involving shared decision-making responsibilities with patients,¹⁰⁶ as well as recent emphasis in undergraduate medical teaching on the benefits of the patient-centered clinical method.¹⁰⁷ Amongst its components, the patient-centered clinical method encourages sharing of information with patients and mutual participation in decision-making.^{108(pp 88,95)} Incorporating the patient-centered clinical method, a more current model of relationship-centered care further emphasizes these principles as well as the importance of reciprocal influences of patient-physician relationship.^{109,110,111} As Quill and Suchman write, “Because patients inevitably bear the consequences – beneficial and harmful – of medical decisions, sharing medical uncertainty with them is a cornerstone of effective, humane care.” Physicians can acknowledge the uncertainty, empathize with the difficulty of not knowing, explore the unique meaning that the illness and its associated uncertainty hold for the patient, and collaborate to develop a plan that represents a negotiated solution that is uniquely suited to the patient, and in doing so, strengthen the bond between patient and clinician.¹¹²

3.5.6 Response Representativeness

Sampling strategy was chosen based on anticipated broad reach through the e-mail circulation lists of the Departments of Family Medicine at Western and McMaster Universities; however, this methodology limited the ability to use personalized contacts or follow-up notices to increase participant response rate. A total of 93 family physicians participated in this study. A maximum of 673 physicians were sent e-mail invitations to participate; the actual number may be less due to some physicians having affiliations with both Departments of Family Medicine at Western and McMaster Universities, thus receiving duplicate invitations, and not all e-mail addresses may have

been functional. Survey response rate was 13.8% at minimum. This is comparable to the response rate of 12.7% to internet-based surveys without incentives for participants in one published study¹¹³ and generally lower response rates to internet-based surveys without use of personalized contacts¹¹⁴ or follow-up notices.¹¹⁵ Results of this study may be most conservatively treated as being generalizable primarily to practicing community family physicians who are comfortable with access to internet resources.

3.5.7 Strengths and Limitations of the Study

Using both quantitative and qualitative study methodology, a strength of this thesis is the depth of study of the uncertainty experience of primary care physicians, from the specific clinical situational cues involved to types of resources accessed in response to that uncertainty. To our knowledge, this is the first study to address the relationship between situational cues and type of external resource accessed. Previous studies have addressed general preferences for various external resources and factors facilitating or inhibiting family physicians' access to those resources. This study addressed the question of whether the likelihood to access each type of resource depends on the specific characteristics of the clinical situation generating the uncertainty. Additionally, this study is strengthened by the comprehensive inclusion of key information resources. There was differentiation made between formal and informal consultations made to specialists; this is an important distinction generally not made in previous studies, but relevant given the implications in timeliness of access to that information and effect on health system resource utilization. Recognizing the value of peers, this study also differentiated between informal consultations made to specialists and those made to family physicians colleagues as information sources, also a distinction generally not made in previous research. Finally, the inclusion of allied health care professionals as an information resource strengthens this study as this is particularly relevant in Ontario given the Ministry's attempt to restructure primary care into interprofessional Family

Health Teams. To date there has been no published literature on family physicians' utilization of this important resource within Family Health Teams.

Other strengths of this study include the use of the Physicians' Reaction to Uncertainty Scale which has been used in several studies as the most recent validated measure of physicians' affective response to uncertainty, and inclusion of a large number of participants but restricting involvement of practicing Canadian family physicians. This is considered a strength because results of previous studies may have been affected by inclusion of U.S. primary care physicians who may be more subject to explicit pressures to control costs; additionally, previous studies have included trainees as well as practicing physicians such that results may have been influenced by variable degree of training. Lastly, this study is unique in its attempt to study physicians' perceived likelihood of accessing various external resources in different clinical situations involving uncertainty, as well as comparing the influence of belonging to a Family Health Team or not to their perceptions of use of these resources. These influences on family physician use of external resources have not been studied previously.

Limitations include the retrospective, self-reported methodology of obtaining data that may affect the accuracy of the data obtained. Because physicians were recruited through e-mail invitation to participate, there may be some selection bias for those more experienced with internet use. Results of the test-retest pilot study, conducted to determine a general sense of stability of responses to Parts B, C, and D of the survey, may have been subject to recall bias given the short duration of two days between test and retest. Low response rate to the e-mail invitation to participate and missing data from some respondents may affect response representativeness and limit generalizability of the study findings. As the clinical situations described in this survey are based on results from the qualitative study of this thesis, results are limited to resources accessed in situations of uncertainty. Resources that might be accessed in more routine situations are not addressed, an example being routine referral of

pregnant patients to obstetricians for antenatal care. Finally, while the Physicians' Reactions to Uncertainty Scale has been validated as a measure of physician uncertainty, variability in scores may be limited due to low representation of recent graduates among physician participants.

3.6 CONCLUSIONS

Results of this study suggest that a significant relationship exists between type of situational cue and type of external resource that the family physicians are likely to access; as well as there being an overall preference for some resources in addition to the interaction. Of the clinical situations described in the qualitative study as provoking feelings of uncertainty, this study found that physicians felt most likely to access an external resource in cases that involved an unfamiliar condition. Overall, when faced with the clinical situations presented, physicians in this study felt most likely to access formal specialist consultations as compared to using other types of external resources. Physicians felt that referral to a specialist would provide greater patient satisfaction than with access to any other type of resource.

In all clinical situations described, physicians reported greater likelihood of accessing internet sources as compared to print reference materials or books. When the case appeared complex or the condition seemed unfamiliar but not serious, physicians felt as likely to access internet sources as they were to refer the patient to a specialist. This suggests that internet resources are considered an important information source when the answers required are not of an urgent or critical nature. Participants ascribed value to the accessibility and up-to-date nature of knowledge provided by internet sources. However, when feeling pressured or when faced with potentially serious conditions, internet resources are much less likely to be accessed.

In all situations, physicians reported being more likely to refer patients to specialists (formal consult) rather than speak directly to specialists (informal consult). With the exception of cases involving a serious or urgent medical problem, physicians were more likely to speak with their family physician colleagues than they were to speak to a specialist. Accessibility and comfort with relationships may be influencing factors. Less experienced physicians reported being more likely to consult with their family physician colleagues than did those with greater practice experience. However, this study found no correlation between years of practice experience and likelihood of consulting with specialists, either formally or informally. Participants emphasized the importance of being able to discuss cases with their family physician colleagues when feeling uncertain and valued working in groups because of accessibility to peers.

The present study found no significant relationship between physicians' reactions to uncertainty (as measured by the PRU score) and their likelihood of referring to specialists. There was also no significant relationship between the PRU score and years of experience in clinical practice. However, based on physicians' comments, uncertainty appears to decrease with increasing practice experience. Physicians commented on the importance of developing an acceptance of uncertainty as being an inherent part of primary care practice. In managing uncertainty, experienced physicians described strategies such as watchful waiting until the diagnosis became clearer and sharing of uncertainty with patients.

Physicians in this study who practice in Family Health Teams did not significantly differ from those not in Family Health teams in their reported likelihood to refer to allied health care professionals or in their perceptions of improved patient satisfaction with care with these referrals. However, physicians in a Family Health Team reported being more likely to consult with a family physician colleague and less likely to refer to a specialist than physicians not belonging to a Family Health Team. Greater accessibility to peers may be an influencing factor.

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CHAPTER 4 GENERAL DISCUSSION AND CONCLUSIONS

4.1 INTEGRATED SUMMARY OF FINDINGS AND FUTURE DIRECTIONS

Primary care medicine is characterized by its broad scope of practice,¹ high degree of uncertainty,^{2, 3,4} and time pressures^{5,6} within which decisions need to be made. Within this context clinical reasoning processes and reflective practice have been studied from a number of different perspectives with the aim of better understanding and improved diagnostic accuracy. Formal models of information-processing and decision-making are often assumed to be normative, proceeding linearly from detection to identification to diagnosis to plan formulation and execution, whereas cognitive processes in the 'real world' may be quite different. In particular, few studies have addressed physicians' cognitive processes when dealing with uncertainty due to significant numbers of patients in primary care who have conditions that defy diagnoses.^{7,8} Knowledge of physicians' behavioral response to clinical uncertainty is also limited. A greater understanding of the circumstances that prompt physicians to access an external resource for assistance in clinical decision making, and knowledge of the types of resources likely to be accessed in those situations, may provide valuable information in planning for systematic and individual supports that can facilitate efficient and safe management of these patients.

This thesis explored the situational circumstances of clinical uncertainty in which participants were prompted to "stop and think" and recognize a need for external help with their decision-making. The two thesis studies contribute to existing knowledge of uncertainty in primary care practice by defining the characteristics of clinical situations associated with the uncertainty experience and identifying the types of external resources most likely to be accessed in each. The qualitative study highlighted the importance of both medical and social factors as influencing physicians' access to external resources and indicated that access to resources may fill medical and social needs of both patients and physicians. While there have been studies that have

demonstrated the influence of both medical and non-medical aspects of the case in clinical decision-making,^{9,10(p 174),11,12,13,14} most have focused on the medical aspects of the case such as the urgency¹⁵ or ambiguity¹⁶, of the presenting problem and comparatively little has been written on the mechanism of social influences on physician resource use.^{17,18,19} This thesis suggests possible mechanisms of influence of social factors on tendencies to access external resources including the generation of greater need to foster patient trust and satisfaction with care, providing a means of alleviating patient anxiety and meeting psychosocial needs, and generating greater feelings of the physician's need to defend his or her decision-making. Further study is required to determine the relative importance of these influences as well as other mechanisms that may be involved. The knowledge gained could direct the training of family physicians to manage these difficult clinical encounters in ways that satisfy patient and physician needs but are more effective and less costly to health system resource utilization than use of specialists' referrals. For example, using principles of patient-centered care^{20,21(pp 88,95)} or relationship-centered care^{22,23,24} with emphasis on mutual decision-making and effective communication skills may facilitate greater patient trust and satisfaction with care. Physicians' feelings of a need to defend decision-making may be reduced with explicit training on shifting the physician-patient relationship from a paternalistic model to more current models of care in which the physician's role is likened to that of a coach.²⁵ Learning to disclose uncertainty in ways that do not undermine patient confidence in their physician may also be helpful.²⁶

The quantitative study included in this thesis provides information on the types of external resources that physicians considered themselves likely to access in each of seven situational circumstances identified as likely to provoke feelings of uncertainty. Of these clinical situations, cases involving unusual or atypical presentations were most likely to prompt access to external resources. This is particularly relevant to primary care practice where patients present in early stages of disease evolution²⁷ and manifestations of illness and disease overlap,^{28(pp 150-151)} and up to 19% of patients will

not have an identifiable disease condition.^{29,30} Participants in this study reported uncertainty as being greatest early in their practicing careers and developing a tolerance for uncertainty with increasing practice experience. Less experienced physicians reported being more likely to consult with their family physician colleagues than did those with greater practice experience and access to experienced peers was described as a highly valued resource in dealing with uncertainty. However, this study found no correlation between years of practice experience and likelihood of consulting with specialists, either formally or informally. This is consistent with findings in the literature suggesting that while the threshold for specialist referrals varies significantly between physicians^{31,39}, for each individual physician it appears to be a relatively stable practice trait over time.³² Thus, for physicians early in their practice careers, informal consultation with experienced family physician colleagues appears to be a particularly important resource in dealing with the experience of uncertainty. Facilitating access to experienced peers may help new family physicians adjust to the uncertainties in primary care practice.

Interestingly, this study found no significant relationship between physicians' reaction to uncertainty (as measured by the PRU score) and number of years in clinical practice. It is possible that differences that occur very early in practice may not have been captured in our sampling of physicians which included very few participants with less than 5 years of practice experience. A previous study had demonstrated that reactions to uncertainty were highest for recently graduated physicians and lowest for those who had established private practice for 5 years or more; beyond that point, PRU scores remained stable.³³ This explanation remains speculative and requires further study.

Both qualitative and quantitative studies confirmed that physicians highly valued specialists as an information resource. This is consistent with literature demonstrating the importance of consultation with colleagues as one of the two most frequently accessed sources of information for family physicians.^{34,35,36,37,38} In the thesis studies,

availability, credibility, and comfort with relationships with specialists were described as influencing physicians' decisions to informally or formally consult with specialists. Literature supports the importance of personal knowledge of the specialist as an influencing factor in choice of specialist referrals^{43,39} but the influence of specialists' availability has varied, with two studies suggesting a strong association^{40,41} and one suggesting no influence.⁴² Supporting the importance of specialist referrals as a resource, physicians in this thesis study felt that referral to a specialist would provide greatest patient satisfaction with care as compared to access to any other type of resource. This finding is consistent with literature demonstrating the desire to foster patient trust and satisfaction with care as a factor motivating a significant number of referrals.^{43,44} Further study would be usefully directed at asking patients themselves about satisfaction with care when specialist referrals are made as compared to use of other resources.

Specialist referrals were particularly valued when dealing with potentially serious clinical conditions, suggesting the importance of this resource when urgent, accurate, contextualized information was required. This study found a greater likelihood to formally refer patients (formal consult) rather than informally speak to the specialist (informal consult) in all situations presented. However, this may reflect systematic practice constraints rather than actual family physician preference. Some participants commented on current lack of comfortable relationships with specialists and inconvenience of arranging informal consultations, whereas in former years, family physicians' regular work in hospitals facilitated easier access to informal consultations and the development of relationships with specialists. The emerging trend to fund some specialists to work with family physicians in Family Health Teams may facilitate the development of collegial relationships and improved access to informal consultations with specialists. This may help to reduce the need for formal referrals in cases where sufficient information could be obtained through informal consults,

resulting in improved convenience for patients and efficient utilization of health care resources.

This study found that family physicians within Family Health Teams were no more likely to access allied health care professionals as a resource - or perceive greater patient satisfaction with care with that access - as compared to family physicians who were not in Family Health Teams. This may reflect the relative newness of Family Health Teams with insufficient time to demonstrate changes in physicians' utilization of this resource. As the Family Health Teams were structured to incorporate the services of allied health care professionals with the intent of improving capacity and quality of care provided to patients⁴⁵, this remains an important area for future research.

However, this study found that physicians belonging to a Family Health Team were significantly more likely to consult with their family physician colleagues and less likely to refer to specialists than those who did not belong to a Family Health Team. This finding was unexpected. With the trend in Ontario's primary care structure towards the development of more Family Health Teams, this finding may have significant implications in terms of health care resource utilization in potentially reducing numbers of referrals to specialists. This is an area in need of further research, measuring actual numbers of referrals made rather than physicians' reported likelihood of referrals to specialists, and comparing these numbers between family physicians practicing within a Family Health Team and those in other primary care practice models. These findings also emphasize the importance of accessibility to both peers and specialist colleagues for the family physician and the need for fostering these relationships. Primary care practice should ideally be structured to facilitate this.

Results of the thesis studies confirm the importance of internet sources of information for family physicians who are comfortable with internet use. The exception involved cases in which patients had potentially serious conditions; in those situations, referral to

specialists was the resource more likely to be utilized. This suggests that internet sources may be important when general information is required, when receipt of the information is not urgent or critical in nature or need not be contextualized to the specific needs of the particular patient. Participants ascribed value to the accessibility and up-to-date nature of knowledge provided by internet sources. This is consistent with various models in the literature that have emphasized the importance of ease of access and efficiency in obtaining information for physicians.^{46,47,48,49,50,51} In this thesis study, there was a statistically significant greater likelihood of physicians using internet resources over print reference materials and textbooks in each of the seven situations identified, and their comments emphasized a preference of internet sources over print resource materials. This differs from findings of several studies, some published as recently as 2007, that found print reference materials and colleagues to be the two most frequently accessed information sources by family physicians.^{52,53,54,55,56} Although recruitment bias for participants familiar with internet use may account for this discrepancy, the present study suggests that at least for physicians who are comfortable with internet use, internet sources are considered a very important resource in managing clinical uncertainty and a preferred resource relative to use of print reference materials and textbooks. These findings may have implications for resource planning in ensuring accessibility to user-friendly, evidence-based internet resources for family physicians who are comfortable with internet use.

Many physicians noted that their uncertainty seemed to decrease with increasing years in clinical practice. Experienced physicians commented on the development of an understanding and acceptance of uncertainty as inherent in primary care practice. The uncertainty experienced early in one's career may reflect a sense of deficiency in one's personal knowledge base as noted in Fox's studies⁵⁷, supported by greater likelihood of consultation with colleagues amongst less experienced physicians, whereas with greater practice experience the recognition of uncertainty may reflect a clearer understanding of the nature of primary care practice where symptom complexes are evolving and

diseases may not yet be identifiable. Experienced physicians described strategies used to manage uncertainty such as separation of cases in which a diagnosis was urgently needed versus those in which a diagnosis was not urgent as well as the sharing of uncertainty with patients. In the literature, other strategies for managing uncertainty have been identified. These include negotiation of key issues that are important to both patient and physician and negotiation of the plan to ensure its acceptability given the patient's particular context, keeping diagnostic options open by making a provisional diagnosis while keeping alternatives in mind, planning for contingencies by providing appropriate if/then statements concerning situations requiring further action, and allowing time for signs and symptoms to develop to help clarify the diagnosis.⁵⁸ Trainees in family medicine may benefit from explicit teaching of these strategies used to manage clinical uncertainty. Similarly, emphasis in medical education on the application of the patient-centred clinical method²⁰ and relationship-centered care^{22,23,24} may facilitate improved communication and care provided in situations of uncertainty. Further studies should be directed at the relative contributions of the different sources of uncertainty and the effect of training to manage these uncertainty experiences.

Strengths of this thesis include the depth of study of the uncertainty experience among primary care physicians using both quantitative and qualitative study methodologies, and, to our knowledge, being the first study to address the relationship between situational cues associated with uncertainty and the type of external resource accessed. This study is strengthened by the comprehensive inclusion of key information resources such as family physician colleagues and allied health care professionals, and differentiation made between formal and informal consultations made to specialists. To date there has been no published literature on family physicians' utilization of allied health care professionals within Family Health Teams, and most studies have not distinguished between formal and informal consultations with specialists and consultations with peers. Other strengths of this thesis includes the use of the

Physicians' Reaction to Uncertainty Scale which has been used in several studies as the most recent validated measure of physicians' affective response to uncertainty, and that this is the first study to apply the PRU Scale exclusively to a large number of practicing Canadian family physicians.

Limitations include the retrospective, self-reported methodology of obtaining data that may affect the accuracy of the data obtained, selection bias for those more experienced with internet use based on method of recruitment, and limited response representativeness and generalizability of study findings due to missing data and low response rate among those invited to participate. Finally, while the Physicians' Reactions to Uncertainty Scale has been validated as a measure of physician uncertainty, its use may be limited to the construct of physicians' reactions to uncertainty and scores may not reflect other dimensions of uncertainty that could influence practice behaviour.

4.2 CONCLUSION

This thesis explored the situational cues associated with uncertainty experienced by family physicians during practice and the external resources likely to be accessed in these situations. Previous studies addressing this issue have been limited, despite the importance of this knowledge in planning for systematic and individual supports that could facilitate efficient and safe management of patients. Results of this thesis further our understanding of common situations of uncertainty and physicians' tendencies to access various resources under these circumstances. The findings lead to a number of implications as well as areas for future research.

An awareness of the types circumstances likely to be problematic for physicians and resources they look to in these situations may help in planning for better access to these resources. For physicians comfortable with internet use, internet-based resources

appear to be highly valued when information of a general nature is not urgently required. Continuing development of user-friendly, credible internet sources may be helpful for these physicians. Referrals to specialists appear to be a particularly important resource when physicians are faced with situations involving potentially serious conditions. Physicians described the choice of specialist referral as being influenced by accessibility and their level of comfort with their relationships with available specialists. Improving current structural supports to facilitate access to specialists and the development of collegial relationships with specialists may assist family physicians in cases in which help with diagnosis and management may be critical to good patient outcomes.

It is clear from both thesis studies that the uncertainty experience is problematic for most family physicians, particularly early in their practicing careers. Consultation with family physician colleagues seems especially helpful for physicians with less practice experience, and access to colleagues appears to be an important benefit of group practice. Structuring practice to facilitate relationships with experienced colleagues may assist family physician graduates in adjusting to the uncertainty of primary care practice. As well, it may be helpful to provide training at undergraduate and post graduate levels on dealing with uncertainty experiences, such as managing patients who do not have an identifiable diagnosis.

In addition to the role of relationships with colleagues, results of these thesis studies highlight the influence of other social factors on physicians' decisions to access external resources. In particular, the perception of anxiety of the patient or accompanying individual, or sense of patient mistrust, were associated with the physician reporting greater likelihood to refer to specialists. Proposed mechanisms of influence include physicians' desire to please and/or desire to defend; these psychosocial mechanisms require further study. Recognition of these important reciprocal social influences may further our understanding of the physician behavioural response to these challenging

situations and the need for exploring alternate methods of management that may be more appropriate and effective both for the patient and the physician. This is an important area for further research.

The importance of patient satisfaction with care was highlighted in both thesis studies. Referral to specialists was associated with the greatest perceived likelihood of increasing patient satisfaction with care; whether this in fact is the case from the patients' perspective should be studied further. Given the overall preference to refer to specialists across all identified situations of uncertainty, desire for patient satisfaction with care may be a significant factor motivating referrals to specialists. The importance of this influence relative to the medical need for referral remains an area for further study. The finding that Family Health Team physicians reported less overall likelihood to refer to specialists and greater likelihood to consult with family physician colleagues may suggest that discomfort with situations of uncertainty may be alleviated by easier access to the support and reassurance of colleagues, again showing the importance of psychosocial aspects of medical practice. This may have important implications for improved health system resource utilization and should be further researched.

The finding of no difference between physicians in Family Health Teams and those not in Family Health Teams in their likelihood of referring to Allied Health Care professionals may reflect the newness of Family Health Teams, with inadequate time for changes in attitudinal or referral practice behaviours to have occurred. This should be further studied. It is important to note that the studies in this thesis focused on situations in which the physician felt uncertain; referral patterns to Allied Health Care professionals may well be different with more routine cases seen in clinical practice.

Experienced physicians described the use of strategies that eased their discomfort with uncertainty; these included the separation of cases requiring urgent and non-urgent diagnosis and management, and the sharing of uncertainty with patients. These are

important areas for further study. Understanding the process that allows physicians to identify cases that may be serious and requiring urgent attention is critical because incorrect determination may result in serious consequences with delayed or missed diagnoses. As the knowledge involved may be largely tacit, it may be helpful to study the situational cues associated with this process, using methodology similar to that of the qualitative study of this thesis. Physicians may benefit from training on how to communicate uncertainty to patients in ways that do not undermine patient confidence in the physician.

As physicians gain in practice experience, they report being less likely to consult with family physician colleagues in situations of uncertainty and a greater general acceptance and tolerance of uncertainty in primary care medicine. It may be important to study the appropriateness of these reported changes, to determine whether this reflects actual increased competence in managing these situations or simply increased confidence.

Finally, the term "uncertainty" in medical practice requires clarification. Currently this concept appears to encompass a variety of constructs including physicians' sense of inadequate personal knowledge, ambiguity of cases in primary care practice, and fundamental limits to knowledge in the practice of medicine. More clearly defining the types of uncertainty and the relationship to physician practice behavior may further our understanding of this important concept in primary care medicine.

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APPENDICES

Appendix I: Survey: Uncertainty and Information-seeking in Family Practice**Uncertainty and Information-seeking in Family Practice**

This is a study of physician judgments in the context of uncertainty. As such, only practicing family physicians are eligible to participate.

Are you a practicing family physician?

Yes

No

Uncertainty and Information-seeking in Family Practice

Section A

Please answer the following:

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
1. I usually feel anxious when I am not sure of a diagnosis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I find the uncertainty involved in patient care disconcerting.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Uncertainty in patient care makes me uneasy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I am quite comfortable with the uncertainty in patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. The uncertainty of patient care often troubles me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

Please answer the following:

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
6. When I am uncertain of a diagnosis, I imagine all sorts of bad scenarios – patient dies, patient sues, etc...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I fear being held accountable for the limits of my knowledge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I worry about malpractice when I do not know a patient's diagnosis.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. When physicians are uncertain of a diagnosis, they should share this information with their patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I always share my uncertainty with my patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

Please answer the following:

	Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree
11. If I shared all of my uncertainties with my patients, they would lose confidence in me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Sharing my uncertainty improves my relationship with my patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I prefer patients not know when I am uncertain of what treatments to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I almost never tell other physicians about diagnosis I have missed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I never tell other physicians about patient care mistakes I have made.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

Part B

When faced with a case that involves a condition with which you are unfamiliar, how likely are you to access each of the following resources...

	Rarely or never	Occasionally	Sometimes	Frequently	Almost always or always
(a) reference manuals, textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) internet sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) ask a family physician colleague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) ask a specialist (informal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) refer to a specialist (formal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(f) refer to an allied health care professional (non-physician health professionals including pharmacists, dieticians, social workers, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

When faced with a case that appears complex (eg. multiple medical conditions or multiple medications involved; psychosocial issues), how likely are you to access each of the following resources...

	Rarely or never	Occasionally	Sometimes	Frequently	Almost always or always
(a) reference manuals, textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) internet sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) ask a family physician colleague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) ask a specialist (informal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) refer to a specialist (formal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(f) refer to an allied health care professional (non-physician health professionals including pharmacists, dieticians, social workers, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

When faced with a case that involves a failure of previous treatment attempts, how likely are you to access each of the following resources...

	Rarely or never	Occasionally	Sometimes	Frequently	Almost always or always
(a) reference manuals, textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) internet sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) ask a family physician colleague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) ask a specialist (informal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) refer to a specialist (formal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(f) refer to an allied health care professional (non-physician health professionals including pharmacists, dieticians, social workers, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

When faced with a case that involves a potentially serious condition (eg. a condition that may require urgent attention), how likely are you to access each of the following resources...

	Rarely or never	Occasionally	Sometimes	Frequently	Almost always or always
(a) reference manuals, textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) internet sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) ask a family physician colleague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) ask a specialist (informal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) refer to a specialist (formal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(f) refer to an allied health care professional (non-physician health professionals including pharmacists, dieticians, social workers, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

When faced with a case in which the patient seems anxious or demanding, how likely are you to access each of the following resources...

	Rarely or never	Occasionally	Sometimes	Frequently	Almost always or always
(a) reference manuals, textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) internet sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) ask a family physician colleague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) ask a specialist (informal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) refer to a specialist (formal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(f) refer to an allied health care professional (non-physician health professionals including pharmacists, dieticians, social workers, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

When faced with a case in which the person accompanying the patient seems anxious or demanding, how likely are you to access each of the following resources...

	Rarely or never	Occasionally	Sometimes	Frequently	Almost always or always
(a) reference manuals, textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) internet sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) ask a family physician colleague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) ask a specialist (informal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) refer to a specialist (formal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(f) refer to an allied health care professional (non-physician health professionals including pharmacists, dieticians, social workers, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice

When faced with a case in which the patient seems distrustful or dissatisfied with your diagnosis or proposed treatment plan, how likely are you to access each of the following resources...

	Rarely or never	Occasionally	Sometimes	Frequently	Almost always or always
(a) reference manuals, textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(b) internet sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(c) ask a family physician colleague	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(d) ask a specialist (informal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(e) refer to a specialist (formal consult)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(f) refer to an allied health care professional (non-physician health professionals including pharmacists, dieticians, social workers, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uncertainty and Information-seeking in Family Practice**Part C**

In general, when you access a reference manual, textbook, or internet resource for patient care, in what percentage of these cases do you think the information obtained improves patient satisfaction with your care?

% of cases:

When you consult with a family physician colleague for patient care, in what percentage of these cases do you think the information obtained improves patient satisfaction with your care?

% of cases:

When you speak with a specialist colleague for patient care (informal consult), in what percentage of these cases do you think the information obtained improves patient satisfaction with your care?

% of cases:

When you refer to a specialist colleague for patient care (formal consult), in what percentage of these cases do you think the information obtained improves patient satisfaction with your care?

% of cases:

When you refer to an Allied Health Care Professional (non-physician health professionals including pharmacists, dieticians, social workers, etc), in what percentage of these cases do you think the information obtained improves patient satisfaction with your care?

% of cases:

Uncertainty and Information-seeking in Family Practice**Part D**

How many patients do you see in a typical week?

Estimate:

In what percentage of your cases would you say you feel uncertain?

% of cases:

Excluding formal patient referrals, in a typical week, how many times do you think you will speak to a family physician or specialist colleague (informal consult) when you are feeling uncertain about a clinical situation?

Estimate:

Please record below any comments that you might have about how you deal with uncertainty in clinical practice and/or access external resources in helping you to deal with that uncertainty.

Uncertainty and Information-seeking in Family Practice**Part E**

Please provide the following information about yourself:

Gender: Male Female**I practice in a Family Health Team:** Yes No**Practice type:** Group Solo**Age:**

-

Years in practice:

-

Uncertainty and Information-seeking in Family Practice

Thank you for your participation in this survey. It is most appreciated. If you are interested in receiving the results, please email Linda Lee at joelinda5@rogers.com.