

What is an appropriate electronic referral for psychiatry?

by

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of the Requirements for the Degree of

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in the School of Health Information Science

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Supervisory Committee

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Abstract

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Medical referrals are requests, typically from generalist to specialist physician, to see a patient in order to offer an opinion or further care and increasingly are conducted through information technology as electronic referrals (e-referrals). This study set out to determine an appropriate e-referral to psychiatry. A field study was conducted. The criteria and supporting information requirements for an appropriate e-referral to psychiatry were determined. These results were used in turn to conduct a gap analysis on current e-referral standards. It was possible to conclude that current standards would not meet the needs for an e-referral to psychiatry. The results were also used as a case study to address gaps in the knowledge of e-referrals. There was a recurrent theme that the development of e-referrals must account for a number of contexts and as such e-referrals should be developed conceptually before technical deployment. Next steps in research were then discussed.

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Dedication

With gratitude this thesis is dedicated to...

Lynn, my partner for life who always supported and encouraged me even when I retreated to my room for hours on end...

My daughters—Alexandra, Olivia and Emma—who always inspired me...

And

All of my professors over the years—if I can see further it is because you encouraged me to climb higher...

Thank you!

Chapter 1

Current Knowledge, Rationale for Research and Research Questions

1.1 Introduction: Appropriateness in Health Information Technology

The notion of “appropriateness”¹ is understood intuitively to mean that something is suitable for a purpose in a given situation. Although this notion is frequently mentioned but not well operationalized in information technology (IT) literature, one author (Khazanchi, 2005) suggested that the appropriateness of an IT system deployment is related to the “fit” between the system’s capacities and the “readiness”—as influenced by the current business climate—of an enterprise to adopt such a system. Although this is a “top down” approach (determining the “fit” of an existing IT system to an enterprise) it is clear that the appropriateness of an IT implementation is contingent upon the needs of an organization operating in a particular context. In this respect the notion of appropriateness should be applied when determining design considerations of health (or any) IT systems. Arguably, the appropriateness of a particular health IT system would ultimately be ensured by designing for the needs of a particular organization in a particular context; although this suggests that appropriateness is just a condition-specific attribute in health IT, there does appear to be a consensus of opinion (Chaudhry B & Wang J, 2006; Hayrinen, Saranto, & Nykanen, 2008; Hillestad et al., 2005) that any appropriate health IT system would necessarily entail some elements:

¹ Disambiguation: the term “appropriate(ness)” is used in two contexts in this proposal—without any qualifiers “appropriate” refers to the suitability of an IT system for a given purpose, otherwise the qualifier indicates a different context, e.g. “clinical appropriateness” refers to the clinical aspects of a referral; these contexts reflect use in relevant literature.

- Clinical data quality: data that are accurate, complete and available to support clinical decision making and workflow;
- Clinical outcomes: *ideally* health IT should facilitate better clinical outcomes for patients, determined variously to be more timely care, better health outcomes or more clinically appropriate interventions;
- Workflow: *ideally* a health IT system would add efficiency and be integrated into (not a determinant of) workflow.

Upon inspection of these criteria it is evident that the concept of “appropriateness” in a health IT implementation entails both the notions of clinical appropriateness and IT appropriateness for a given context. Of note, there is no clear consensus that health IT has achieved these outcomes on a consistent basis (Djulbegovic et al., 2011). Even so, it is reasonable that these desired outcomes should inform design considerations for an appropriate health IT implementation.

This framework for operationalizing the concept of appropriateness for health IT will be used to assess basic requirements for electronic medical referrals (e-referrals) in the context of referrals to psychiatry. After a brief review of the literature in order to establish relevant background and the need for research, this project will describe a study that used qualitative methodology in order to address the question: *what is an appropriate e-referral for psychiatry?*

accept a referral, and the well-established principle of patient autonomy also allows a patient to decline attending for a consult.

Inherent in any definition of a medical referral is the notion of *process*. Put another way, a referral is not merely a request for additional help; rather, it involves exchanges of information and the involvement of the referring source (usually a physician), the consultant (again, usually a physician) and the patient. For the purpose of this proposal, then, the concept of a medical referral entails the entire process from initiating to completing a referral. As such a typical referral process can be modelled. (Figure 1: Activity diagram for the conventional medical referral process -Appendix 1).

In a review of the literature this seemingly straightforward process can be problematic at several points. From a systemic point of view there is an increasing number and burden of referrals with all that implies for accessing limited resources. (Barnett ML, Song Z, & BE, 2012) There is no consensus on the reason for the increase in referrals. Arguably, factors such as perceived increasing complexity of care (Katerndahl, Parchman, & Wood, 2010), non-medical factors such as the malpractice law in a jurisdiction (Xu, Spurr, Nan, & Fendrick, 2013) and many other non-clinical factors (Evans, Aiking, & Edwards, 2011; Forrest C & RJ, 2001; Forrest C B, Majeed A, Weiner J P, Carroll K, & B, 2002; Forrest C B, Nutting PA, Starfield B, & von Schrader, 2002; C. B. Forrest, 2006; McBride, Hardoon, Walters, Gilmour, & Raine, 2010) can affect the decision to refer and in turn the overall rate of referrals. While the implication of an increasing number of referrals is that some problems are over-referred, in fact one author indicates that at least in one area more referrals are needed. (Ayub A et al., 2012) Other

authors have commented that there is evidence for both over-and under-use of referral to specialists depending on context. (Mehrota, Forrest, & Lin, 2011)

In various specific contexts referring physicians--typically primary care providers--and consultants can have differing expectations for the outcomes of referrals. One study in fact found that most primary care physicians were looking for advice about diagnosis or further care, but there were still a number of requests for the consultant to assume care. (Blundell, Clarke, & Mays, 2010) Yet, another study indicated that some specialists wanted more involvement in ongoing care and this was at odds with the requests from the referring physicians. (Swartzrauber, Vickrey, & Mittman, 2002) Even if it is agreed that the primary expectation is advice about treatment then at times this role is not addressed as one study indicated that only 62% of letters from specialists contained such advice. (C. B. e. a. Forrest, 2000). While it is prudent to avoid generalizing from specific contexts, these examples do illustrate that referring sources and consultants can have different expectations about the referral process.

Conceivably, one reason leading to differing or unmet expectations is the quality of communication and coordination in the referral process. Lin (Lin, 2012) has commented on the often poor quality of communication in the process. Newton (Newton J, Hutchinson A, Hayes V, Mackee I, & C, 1994) also commented on some important gaps in communication primarily on behalf of referring physicians. Scott (I. Scott, C, & E, 2004) also commented on the often poor quality of consultants' letters to referring physicians. Gandhi (Gandhi et al., 2000) reported remarkably high rates of inadequate communication from primary care providers in one study. Certainly consultants and referring physicians differ markedly in their perceptions of adequate communication

(O'Malley & Reschovsky, 2011) but both parties are often dissatisfied with the quality of communication. (Gandhi et al., 2000)

Astonishingly many referrals are not completed as patients do not attend appointments with consultants. After looking at information in electronic health records (EHR) Zuckerman (Zuckerman, Cai, Perrin, & Donelan, 2011) noted that on average one-third of children did not attend appointments with specialists; the reasons for non-completion were attribute to patient factors such as “not chronic” (presumably the problem resolved), older age of child, long wait times and economic factors. Weiner (Weiner, Perkins, & Callahan, 2010) looked at data for older patients and reported that about one-half of referrals were not completed, and described multiple errors including poor communication and misdirected referrals. Similarly Friedman (Friedman SM, Vergel de Dios J, & K, 2010) looked at discharges from an emergency department and found a number of factors to account for non-completion, chief among them the patients' choice not to attend.

Perhaps the most problematic factor in the referral process is the clinical appropriateness of the referral. This has been noted in a number of contexts (Basarab, Munn, & Jones, 1996; Forman et al., 2010; Mariotti, Meggio, de Pretis, & Gentilini, 2008) including psychiatry.(Belgamwar, Bates, Goes, & Taylor, 2012; Kada, 2007; Slade et al., 2008; Soto et al., 2009) In review there did not appear to be any consensus on the definition of clinical appropriateness with respect to physican referrals. (Guevara, Hsu, & Forrest, 2011; Mehrota et al., 2011) Blundell (Blundell et al., 2010) provided a useful defintion as a a result of surveying some stakeholders. The stakeholders identified three key factors:

1. Necessity: defined in terms of the likelihood of the consultant providing additional care, or if all treatment options at the primary care level were exhausted and specialist input is needed;
2. Destination: was the referral sent to the right consultant?
3. Quality: defined in terms of information in the referral, especially pertaining to the investigations done beforehand.

Concerns have been raised about all three factors. For example, one author specifically addressed the notion of destination. Speed (Speed, 2005) identified many “misdirected” referrals from the point of view of the receiving service. On the other hand, Barnett (Barnett, Keating, Christakis, O’Malley, & Landon, 2011) talked about the “professional network” as a prime determinant for the destination of referrals from primary care physicians. In a similar vein there are different perspectives about quality. As evident from the above discussion about communication there are often deficiencies in the communications to and from consultants.

Upon review there was considerable disagreement around the criteria for assessing the necessity of referrals. From the specialist’s perspective, Hsu (Hsu, Schwend, & Leamon, 2012) lamented that almost one-half the reviewed referrals were for problems “manageable by primary care physicians.” In addressing the reasons for primary care physicians to make referrals—indirectly addressing the question of “necessity“ -- many authors talked about the complexity of the primary care practice and emphasized that a decision to refer often entails numerous factors such as available resources, patient demands, and practitioner familiarity with the problem (Chan & Austin, 2003; Elwyn & Stott, 1994; Forrest C B, Nutting PA, et al., 2002; C. B. Forrest,

2006; Morgan, 1989) and factors particular to a given practice such as “case mix,” physician gender, and physician experience. (Franks, Williams, Zwanziger, Mooney, & Sorbero, 2000; Starfield, Forrest, Nutting, & von Schrader, 2002) Forrest (Forrest C & RJ, 2001) in particular emphasized that primary care physicians need to be aware of the “scope” of their practices and refer accordingly, but clearly the “scope” of a practice entails more than just medical knowledge about a problem, a perspective seemingly not acknowledged by specialists. Clearly there is no consensus on judging the necessity of referrals.

Finally, some studies looked at interventions to improve the referral process however “improvement” was defined. The results were mixed. Slade (Slade et al., 2008) failed to demonstrate either successful implementation or benefit from an intervention. Clarke (Clarke et al., 2010) showed some improvement in quality of communication but not appropriateness overall. Similarly, Choo (Choo, Thennakon, Shapey, & Tolia, 2011) demonstrated better pre-referral documentation but was not able to demonstrate better care. One study using an electronic system (K. Scott, 2009) demonstrated both better quality in terms of more rapid processing of referrals and improved appropriateness of referrals; although mentioned, it was not clear how the same system improved “appropriateness.” Hwang (Kim-Hwang JE, Chen AH, & Bell DS, 2011) did demonstrate modestly improved appropriateness after an electronic referral was implemented. The Cochrane Library recently published a review of interventions. (Akbari A et al., 2011) While the authors did not find many well-conducted studies, they did conclude that the interventions of providing “structured referral sheets” as guidelines, specialists providing “active education” and some “organizational interventions” were modestly successful in

reducing referral rates. Overall there is yet limited evidence for effective interventions, especially those systems supported by information technology.

In summary, the process of referring patients to specialists is problematic in many respects. Primary care physicians and specialists may have different expectations about the referral process in terms of the outcomes (e.g., providing advice vs. providing further care) as well as the need for referrals (with studies indicating both under- and over-referrals to various specialties). The traditional “paper method” of referrals does not facilitate effective communication and coordination of care; this may result in relatively poor patient compliance with appointments and follow-up care. Some authors commented on the poor quality of referrals on many levels such as demonstrating the need for consultation, clinical documentation and choosing the right specialist. All of the above issues are captured in the literature under the concept of the “appropriateness” of medical referrals. Despite the problems there is only limited evidence of effective interventions to improve the process. There is one particular gap in the literature. To date there is no systematic survey data for any of these problems. As such, it is difficult to appreciate the true scope of these problems. In this respect it would be helpful to know which specialties and primary care practices are more likely to experience problems with the referral process. Epidemiologic data would allow further examination of all the factors that are problematic as well as the ability to target interventions.

1.3 Referrals to Psychiatry: problems in context

Conceivably some specialties might be particularly prone to problems in the referral process and this may indeed be the case in psychiatry. First, there has been

longstanding concern about the high rate of inappropriate referrals to psychiatry (Cubbin S, Llewellyn- Jones S, & P, 2000; Hall, 1994; Moselhy & Salem, 2009; Slade et al., 2008; Soto et al., 2009), yet even in these articles “appropriateness” is defined poorly (if at all) in the context of requests for psychiatric consultation. The expectation that the consultant will assume care seemed particularly prevalent when referring to psychiatry. (Creed, Gowrisunkur J, Russell E, & Kincey, 1990) In terms of the quality of referrals, Evans (Evans J et al., 2002) talked about “serious inefficiencies” in the “communication interface” between general practitioners and psychiatrists leading to high rates of clinically inappropriate or incomplete referrals. Durbin (Durbin et al., 2012) reviewed a number of studies and found generally inadequate communication in both directions between general practitioners and psychiatrists. Moreover, interventions had limited or even adverse effects in addressing these problems. (Slade et al., 2008) Al-Amri (Hasan S. Al-Amri & Al-Gelban, 2002) and Ras (Ras J, Botha UA, & Niehaus DJH, 2011) both reported that referrals frequently lacked critical information such as documentation of medical comorbidity, substance use history, or even the reason for the referral. Ras acknowledged that most referrals were processed regardless of insufficient information content but also stated that many of the referrals he examined could have been handled more efficiently had the letter of referral contained appropriate information. Other authors (Moselhy & Salem, 2009; Tanielian et al., 2000) have also described similar problems with referrals to psychiatry. In general, there was a theme that appropriate requests for referral to psychiatry, specifically requests with sufficient information, would allow for more efficient disposition and triage of the referral.

1.4 Electronic Medical Referrals: *e-referrals*

The use of information technology to facilitate medical referrals, namely electronic medical referrals or *e-referrals*, is one possible solution to help with the problematic aspects of referrals in general. That said surprisingly little literature concerning the use of e-referrals to improve the process has been published. One recent review identified only 26 articles describing deployment of e-referral systems (Naseriasl, Adham, & Janati, 2015) although they have been used since 1990 (Tian, 2011). Upon review, some themes emerged from the extant literature on e-referrals.

First, it seemed clear that simply using information technology to conduct the referral process as it stands does not confer any benefits. Hysong (Hysong et al., 2011) and Singh (Singh et al., 2010) both reported on e-referral systems attached to Veteran's Affairs centers. While the functionality of the systems was not described in any appreciable detail, apart from the helpful capacity to track referrals the systems did not seem to offer any added benefits compared to conventional referrals. Hysong reported that both referrers and specialists were not satisfied with many aspects of the system including the lack of policies and directions for use of e-referrals, the content of the e-referral messages, the ability to discern a need for a referral in the first place, and problematic patient follow-up. Singh addressed specifically the problems in patient follow-up and attributed the relatively high rates of poor follow-up from both referral sources as well as consultants to breakdowns in communication.

Another study also failed to demonstrate any clear benefit to e-referrals. Shaw and de Berker (Shaw LJ & DAR, 2007) looked at referrals to a dermatology service in a British system that incorporated e-referrals. In many cases the e-referrals were less

adequate than usual paper referrals in conveying key information. Again the functionality of the system, including the capacity for using electronic forms specific for dermatology, was not discussed.

Some studies have demonstrated improvements in the quality of referrals when communication is more specifically addressed by an e-referrals system. Kim-Hwang (Kim-Hwang et al., 2010), Chen (Chen, Kushel, Grumbach, & Yee, 2010) and Kim (Kim, Chen, Keith, Yee, & Kushel, 2009) all reported on experiences with the e-referral system associated with the San Francisco General Hospital. All three authors talked about the “iterative” nature of the communication involved, meaning the possibility of dialogue between referral source and specialist in preparation to submit the referral. Hwang surveyed specialists and noted that many were satisfied that such communication diminished the number of inappropriate referrals. Chen surveyed the referral sources—primary care physicians—and noted that the ability to “foster electronic dialogue” led to many primary care physicians feeling that care overall was improved, although they also reported that the system was “more time consuming.” Likewise Kim surveyed primary care physicians and noted that most reported improved clinical care due to guidance from specialists before submitting referrals, better consults from specialists insofar as the consultants’ responses better addressed the referral question, and improved wait times before seeing a consultant. Kim also remarked that some users complained that submitting an e-referral was more time consuming. Of note, all three authors mentioned that this system has the capacity to have specialists review and triage requests for consultations; as a rule this capacity is generally not available in the referral process.

Few studies addressed the issue of the impact of e-referral systems on the clinical appropriateness of referrals, and none did so as the sole focus of the study. Kim-Hwang (Kim-Hwang et al., 2010), as discussed above, noted fewer clinically inappropriate referrals. In another study, Kim-Hwang looked at the effects of introducing a web-based e-referral system on the overall quality of referrals. The referrals were rated by specialists using a previously constructed scale for the study. Overall there were modest improvements in the clinical appropriateness of the referrals as well as improvements in follow-up rates. Dennison (Dennison, Eisen, Towers, & Ingham Clark, 2006) and colleagues constructed a form for referring colorectal problems that was used within an existing system in England. While she reported data that indicated better patient attendance and more rapid processing of appointments, she also mentioned that 90% of referrals were deemed clinically appropriate, although it was less than clear how this kind of appropriateness was determined.

Other studies remarked on the improved quality of referrals using an e-referral system, but the improved quality was defined in different ways. Many suggested quality was improved by the outcomes of shorter waiting times (Reponen J, Marttila E, Paajanen H, & A, 2004; J. G. Warren, Y; Day, K; Warren MP, 2012), finding the right service or consultant (Alshami, Almutairi, & Househ, 2014), more efficient processing of referrals (Docherty; Reponen J et al., 2004; J. Warren, White, Day, Gu, & Pollock, 2011), the ability to track referrals (K. Scott, 2009), better patient attendance rates (Dennison et al., 2006) and the ability to reject or accept and assign the right priority to the referral (Chen et al., 2010). Warren suggested that in fact better quality as defined by many of the above factors is the value added by e-referrals.(Warren J, 2012)

One study was more explicit in linking a notion of clinical appropriateness to improved outcomes. (Fischer, Martinez, Driscoll, & Conway, 2010) Fischer and colleagues described a web-based system in Chicago. The referring source is forced to use an interface that presents “branching logic that requires a series of clinical responses regarding the patient’s diagnosis or symptoms (p. 973).” At the end, the referral is either allowed or denied. The implication was that only appropriate referrals were allowed. Fischer reported better outcomes in terms of reduced backlog of referral requests to high demand specialties and diagnostic services. Fischer also talked about other types of value from the system, including the ability to generate and use administrative data. Implicit in the article, though, was the notion that clinically appropriate referrals—enforced by the system—generate better outcomes in terms of work-flow efficiency.

There were additional themes specific to the literature on e-referrals. Wootton (Wootton, Harno, & Reponen, 2003) talked about the organizational aspects of e-referrals in reference to two systems in Finland and one in England. He commented on the “significant changes” required to implement such systems, and mentioned three factors:

1. The impact on funding for services (especially if the number of referrals drops),
2. Changes in scheduling practice and staffing if electronic consultations are incorporated, and
3. The need to integrate e-referrals into EHRs.

As discussed these were all identified as potential problems and by implication potential barriers to adoption and acceptance. Heimly (Heimly, 2008) talked about other organizational factors in reference to a national system in Norway, including the need to

have local health authorities cooperate and the need to incorporate current work processes into the e-referral system. Again, these could be construed as potential barriers to adoption. Pagliari (Pagliari et al., 2005) talked more specifically about barriers and mentioned factors such as the stability of the technology, the information technology skills of the users and the need for dedicated time for training for the system as potential problems in adopting and implementing e-referrals.

Other authors commented on the developmental aspects of e-referrals. Warren and colleagues, in particular, have commented extensively on this issue (Gu Y, Warren J, Day K, Pollock M, & S, 2012; Warren J, 2012; J. Warren et al., 2011; J. G. Warren, Y; Day, K; Warren MP, 2012). Warren has emphasized the need to include stakeholders in the development of any e-referral system. He has also talked about the need for an “iterative” approach by means of repeated consultation and review with all stakeholders. Intriguingly, the sparse literature on the development of e-referral systems has tended to emphasize the prominence of systems’ needs, such as directing referrals to consultants with the highest chance of accepting any given referral (Almansoori, Murshid, Xylogiannopoulos, Alhajj, & Rokne, 2012; Reinhart et al., 2011 IEEE 13th International Conference on e-Health Networking, Applications and Services).

There was also a sense from reviewing the literature that successful implementation and the benefits conferred by e-referrals (especially clinical appropriateness) were highly specific to context. Heimly (Heimly, 2009) reviewed several national initiatives to implement e-referrals and reported quite different experiences. He emphasized the need to account for “sociotechnical aspects” when introducing e-referrals in a particular national context. By no means should context be

defined in terms of any political jurisdiction as, arguably, the papers reviewed all demonstrated particular context such as clinical context (Dennison et al., 2006; Shaw LJ & DAR, 2007), a particular clinical problem (Gu Y et al., 2012; K. Scott, 2009) or specific systems. With respect to the latter, it is instructive to contrast the experiences of the users of the Veteran's Administration (Hysong et al., 2011; Singh et al., 2010) and San Francisco Hospital systems (Kim-Hwang et al., 2010). One key difference between the systems seemed to be the capacity of one system (implemented in San Francisco) that allowed triage of referrals; typically this capacity is not present in most referral processes. As such it is hard to find generally applicable principles when discussing e-referral implementation.

No study addressed specifically the impact of the type of technology used in the e-referral. Various, email (Wootton et al., 2003), web portals (Kim-Hwang et al., 2010; Reponen J et al., 2004) and dedicated systems such as "Choose and Book" in England (Dennison et al., 2006; Green, McDowall, & Potts, 2008; Shaw LJ & DAR, 2007) were mentioned in passing but no author commented specifically on the merits or drawbacks of any particular technology used to implement e-referrals. Esquivel (Esquivel, Sittig, Murphy, & Singh, 2012) suggested that e-referral systems should have the capacity for "real time" or synchronous communication between referral sources and consultants, but did so because "real time" communication occurs frequently in traditional clinical referrals so any e-referral system should parallel this process; he neither cited any instances of implementation nor evidence of use or benefit. The effect of a given technology on e-referrals remains an open question.

Finally, there was sparse extant literature on e-referral implementation in Canadian jurisdictions. Manitoba ("Manitoba e-referral,") has recently implemented a system but there was no literature on any outcomes. There were reports of planned implementations from other areas such as Alberta ("Alberta Fee Guide ") and Nanaimo ("Nanaimo e-referral,"). One article (Reinhart et al., 2011 IEEE 13th International Conference on e-Health Networking, Applications and Services) proposed a system, but it was not clear to what extent--if any--stakeholders were consulted during development. In any event, it has yet to be tested.

1.5 e-referrals: Current Knowledge, Questions and Need for Research

The nascent literature on e-referrals seemed to imply some ability to help with the problematic aspects of conventional medical referrals but fell short of describing any theory or principles that could guide the development and use of e-referrals in order to address these problems. There was one assumption in the literature that should be made explicit, namely that the concept of *e-referrals* should mean in essence *e-referral systems*. Clearly, the benefits of e-referrals are not realized simply by translating the clinical documentation into electronic formats; rather, any benefits seem to arise from the capacities of the systems surrounding e-referrals. With this in mind the emerging literature raises a number of intriguing questions that highlight gaps in the knowledge:

1. How can the appropriateness of a referral (electronic or otherwise) be defined or assessed in an operationally useful way?

Although some authors did assess the appropriateness of e-referrals, including appropriateness as a measurable outcome, it was less than clear what criteria were used in determining appropriateness. Arguably, these criteria should be made explicit and--ideally--there should also be consensus among end users about the necessary conditions for an appropriate e-referral in order to guide future development of e-referrals.

2. What is known about the process for developing and implementing e-referrals?

The few articles that address this question, albeit indirectly, emphasize the need for an “iterative” approach (Warren J, 2012) or other capacities such as clinical decision support (Almansoori et al., 2012; Fischer et al., 2010). This approach is reminiscent of the iterative software development cycle, entailing frequent consultation with stakeholders. As such it is likely to be time and labor intensive. Moreover, this process seems to be needed for each clinical problem that could result in an e-referral. In developing an e-referral in this manner it is natural to assume that the current capacities of any systems are taken into account, but it is not clear what this would mean when implementing such a system for potential users who were not part of the consultation process. This in turn generates a number of questions that as yet are not fully addressed in the literature:

- Are there generally applicable principles in developing e-referrals?
- To what extent is the development and implementation specific to clinical or organizational context?
- Given the time/ labor needed, what is the organizational impact of developing and implementing e-referrals?

3. How can e-referrals improve the quality of medical referrals?

The studies that addressed this question implied that some sort of communication between the referral source and recipient improves the clinical appropriateness of the referral. As such, the ability of e-referrals to improve quality may be a function of the system's capacity to facilitate communication rather than a function of the e-referral document or artifact per se. In the case of the San Francisco system (Kim-Hwang JE et al., 2011; Kim-Hwang et al., 2010) this communication, described as “iterative,” seemed to occur alongside submission of the e-referral. Arguably, even when the e-referral was developed in joint consultation there was “iterative” communication during the development process that was captured in the actual e-referral form. Apart from iterative communication, the only other article that suggested how e-referrals could improve the quality (and by extension the overall appropriateness) of referrals was Fischer's (Fischer et al., 2010) description of a web-based system that enforced clinical data by a context-specific, decision-support feature. In turn, these points also lead to a number of questions:

- Are there capacities apart from facilitated generation of the e-referral (e.g. integrated clinical decision support systems, “iterative” communication around submitting the referral) that could improve quality of referrals?
- What kinds of communication (e.g., pre-consult messages, synchronous vs. asynchronous) help to improve quality?
- What kinds of data are needed at a minimum? What is the best way to ensure high quality clinical data?

- Is there in essence a need for *electronic consultations* (e-consults) as part of e-referrals?
- What is the impact of these added capacities on clinician time and remuneration?
In turn, does this affect adoption/ implementation? What do these capacities mean for work-flow?

4. How can e-referrals facilitate better outcomes for patients and organizations?

The capacity of an e-referral system to facilitate and track documentation around appointments may lead to better outcomes such as timelier and better completion of referrals, and indeed some studies, as described above, suggested this has been the case. It is not clear, however, whether e-referrals can lead to better clinical outcomes (e.g. more timely care leading to earlier resolution of symptoms). . In this respect there would seem to be many component questions that need to be addressed in order to answer the question about benefits to patients and organizations:

- How can e-referrals ensure appropriate triage and priority for referrals? For example, when could an e-referral be better addressed by an electronic consultation (e-consult) or referral to a different resource?
- How can e-referrals facilitate more timely care?
- How can e-referrals facilitate appropriate follow-up?
- What outcomes need to be tracked? What metrics should be developed in order to track outcomes?
- What organizational changes are needed to facilitate any potential benefits of e-referrals?

5. What is the impact of particular technical deployments on the potential benefits of e-referrals?

Intuitively this question is related to many of the above questions. Specifically, the technical deployment of an e-referral system would be informed by the perceived requirements in order to address the questions or concerns as discussed above.

Practically, it is more likely the case that e-referrals would be developed within existing systems, and as a result the technical aspects and e-referrals would influence and inform the development of each other. Again, a number of questions arise:

- What do the various technical options (e.g., web-based, stand alone, integrated into an electronic health record) imply in terms of ensuring appropriateness—however appropriateness is defined—of the referral process?
- What do the various technical options imply in terms of interoperability? Confidentiality? Security?
- What is the organizational impact of either integrating with an existing e-referral system or developing a new system?

Ultimately a number of concerns that could inform research into e-referrals emerge from considering the literature and the above questions:

1. There are many and longstanding problems (e.g., defining and ensuring the clinical appropriateness of referrals, communication and coordination, completion) in the medical referral process;
2. It is not clear how and to what extent IT (as e-referrals) could address these problems;

3. It is not clear how e-referrals could enhance patient care or confer benefits to organizations beyond the potential to address known concerns with the referral process;
4. It is not clear how e-referrals should be developed and implemented in order to meet the clinical and work-flow needs of end users.

From a different perspective it is possible to conceive of an “ideal” e-referral that addresses these concerns. The ideal use of an e-referral for the medical referral process, based on these premises arising from a review of the literature, can be illustrated as a concept map. (Figure 2: Concept map for an ideal e-referral – Appendix 1) Clearly there is a need to conduct research in order to address these concerns; developing a rationale for relevant questions given all the possible questions requires additional analysis.

1.6 Research on e-referrals: developing a rationale for a research project

Any research question in health informatics should be informed by current knowledge, gaps in the current knowledge and the significance of the research questions. These principles will be used to develop a rationale for some research questions about e-referrals.

1.6.1 e-referral research questions: how specific?

There are also many possible levels of abstraction, and consequently potential foci for investigation, with respect to e-referrals. For example, it would be possible to examine just the required capacity of an e-referral system to facilitate communication in terms of tracking referral status, contacting patients and ensuring completion. It might be

premature, however, to conduct research on e-referrals at such a specific level of development; in the above example referral completion may be contingent upon other, as yet not determined, factors such as the type of questions triggering the referrals and the type and quality of the data contained in the e-referrals. Given the relatively early deployment of e-referral systems and the likelihood of a number of factors influencing the use and benefits of e-referrals, it would seem prudent to start at a level of abstraction that would consider the development of e-referrals more fundamentally--rather than drill down on a specific aspect--in developing a focus for research. An appropriate level of abstraction given the early stage of development would then include consideration of a number of basic components of an e-referral such as determining the conditions for deeming an actual e-referral document as appropriate and the information requirements to ensure clinical utility and to support workflow. This level is illustrated by the components enclosed by the rectangle in the concept map (Figure 2: Concept map for an ideal e-referral Appendix 1).

1.6.2 e-referrals in Psychiatry: a context for research

E-referrals have been described for some clinical scenarios but as yet there is a paucity of research on the use of e-referral systems for psychiatry. As such this is a gap in current knowledge that begs the need for research. Certainly, it is likely that much or all of the above discussion about e-referrals in general likely applies to the specific case of e-referrals in psychiatry. In addition, it is a reasonable hypothesis that many factors specific to the situation of referrals to psychiatry would prove problematic in deploying an e-referral system for the specialty; these problems might reflect the rather different work

environments of primary care providers and psychiatrists. For example, it is conceivable that psychiatrists would like to see a great deal of information—including information on previous treatments and responses, substance use, and other medical complaints—incorporated into referral letters. On the other hand, a busy primary care physician might protest that the nature of a busy practice prohibits spending the time needed to include such information and that any rate “it’s the psychiatrist’s job” to elicit such information. Enforcing a minimum amount of information in a standardized referral letter to psychiatry might nonetheless be indicated. Indeed, some authors have commented that while primary care physicians do respond well to using standardized referral forms there are limits to the usability (and hence usefulness) of such forms if they are judged to be too long. (Couper & Henbest, 1996; Qureshim, van der Molen, Al-Habeed, & Magzoub, 2007) In another example, primary care physicians may refer to psychiatrists whereas there may be other more appropriate resources in the community, such as mental health teams, for the patient. In this case, an e-referral system would need to incorporate the capacity to inform primary care physicians about the appropriate resource for any given patient. (Belgamwar et al., 2012) There are many other hypothetical scenarios but these examples serve to illustrate the context sensitivity in contemplating any research on e-referrals for psychiatry.

1.6.3 Significance of research in e-referrals

It is also important to identify goals in developing an e-referral for any given context (*Health Informatics Reserch Methods: Principles and Practice*, 2009) (p.193). As discussed above simply moving current practices to electronic formats confers little

benefit. As inferred from the previous discussion, goals for the future deployment of e-referrals might include developing IT solutions to confer benefits such as:

- Greater efficiency: this could be assessed by a number of parameters, including lower costs, better triage of patients to the appropriate resource and less time spent on processing referrals for subsequent disposition, and;
- Better clinical outcomes: this could be assessed by a number of metrics including shorter waiting time (as a proxy to receiving definitive care and relief of symptoms) and greater patient and caregiver satisfaction with the referral process.

Even though goals can be identified, arguably little is known about the design requirements needed to meet these goals. It would seem to be the case, then, that the significance of research in e-referrals would entail determining design requirements in order to meet such goals.

Based on the discussion in the first sections, as a first step it would also seem reasonable that research should focus initially on the information required in order to ensure that the referral is appropriate. Based on discussion thus far, stated simply an appropriate e-referral would:

1. Ensure the right information is submitted (Fischer et al., 2010);
2. The information submitted conforms to accepted standards for clinical data quality (Wyatt & Liu, 2002)--data are accurate, complete, consistent and available;
3. Ensure the information is submitted by the right medium;
4. Ensure the right process for the e-referral (e.g. submission occurs in acceptable format, submission and receipt are acknowledged);

5. The “rightness” is gauged against the suitability or appropriateness for intended outcomes (e.g. clinical appropriateness, integration into and efficiency of workflow).

It should be noted that these requirements are, in essence, independent of any particular IT solution and in fact determining the best way to manage information and related workflow should suggest appropriate IT solutions.

1.6.4 e-referrals: rationale for research

In summary the research for this project was informed by the need to address the right level of abstraction (basic information needs), in a particular context (e-referrals in psychiatry) and for a specific requirement (ensure appropriateness of the electronic referral document). This rationale was reflected in the formulation of the research questions for this project as outlined in the Methodology section (2.1).

1.7 Research Project and Contribution to Knowledge

In order to address these research questions, a study entitled “*What is an appropriate e-referral for psychiatry?*” was conducted. This study used qualitative methods to analyze the responses of interviews with specific stakeholders (psychiatrists, non-psychiatrists who administer the intake of requests for consultation) in order to determine the criteria for appropriateness and the minimum information requirements for an appropriate e-referral to psychiatry. In turn, the information model that was developed was used to answer the research questions.

It was anticipated at the outset that this study would contribute to the corpus of knowledge about e-referrals in two ways:

1. The results would contribute to empirically derived, stakeholder- informed guidelines for the implementation of e-referrals in psychiatry;
2. The results would validate a method for determining appropriateness and minimum information requirements for e-referrals in a given context.

The conduct of this study, analysis of data, results and discussion are presented in subsequent chapters.

Chapter 2 Methodology

2.1 Research questions for the study

Based on a review of the current knowledge about e-referrals to psychiatry and the subsequent consideration of the rationale for further inquiry some research questions were developed in order to guide the development of this study. The research addressed one main question: **what is an appropriate e-referral for psychiatry?** In order to answer this question, some key component questions about the constituent aspects (clinical and IT appropriateness) and current use of e-referral systems were formulated:

1. What are the minimum criteria that must be satisfied in order for a referral to psychiatry to be deemed as appropriate?
2. Given the minimum criteria for an appropriate referral to psychiatry, then what are the minimum information requirements needed to satisfy the criteria for an appropriate referral to psychiatry?
3. Given an information model based on the minimum information requirements for an appropriate referral to psychiatry then what does this imply for IT implementation in terms of delivering an appropriate e-referral to psychiatry?
4. How well do current standards for e-referrals meet the needs for appropriate e-referrals to psychiatry?
5. What does an appropriate e-referral to psychiatry offer in terms of potential improvements to the current practice of referring to psychiatry?

A research project was developed in order to elicit the data needed to address these research questions. First, a field study was conducted in order to develop an information model for an appropriate e-referral to psychiatry. In addition, an environmental scan of current e-referral deployments was conducted. Finally a gap analysis based on the results of the field study and environmental scan was performed in order to generate information needed to address the research questions.

2.2 Design and conduct of the field study

A field study was designed primarily in order to obtain empirical data required to address two key questions:

1. What are the minimum criteria that must be satisfied in order for a referral to psychiatry to be deemed as appropriate?
2. Given the minimum criteria for an appropriate referral to psychiatry, then what are the minimum information requirements needed to satisfy the criteria for an appropriate referral to psychiatry?

The empirical data collected from the field study were analyzed and distilled into results in order to answer these two questions.

2.2.1 Qualitative approach

From the outset the field study was designed as a qualitative project. A qualitative approach was justified for two reasons:

1. First, there was little specific information in the extant literature on referrals (electronic or otherwise) to psychiatry about minimum information

requirements for appropriate referrals. As such, it was not possible to generate any quantitatively testable a priori hypotheses about the information needs for appropriate e-referrals to psychiatry. If anything, there seemed to be a need to generate such hypotheses and a qualitative approach is suitable in such a situation.

2. It was anticipated that the data collected would be narrative in nature. A qualitative approach is indicated for data that is narrative in nature.

2.2.2 Data sources

From the outset the field study was intended to collect data by interviewing stakeholders, namely psychiatrists and non-psychiatric personnel in offices or clinics who might handle or otherwise be involved in the workflow around receiving and processing referrals. These two target respondents were identified primarily on the basis of the rationale for the research and the need to answer questions about information requirements for e-referrals. It was reasoned that these two respondents of stakeholders could be regarded a priori as having the best knowledge around the information needs for referrals to psychiatry. For convenience the two types of stakeholders were named as:

1. Psychiatrists
2. Administrators (non-psychiatric personnel)

Letters of invitation and questions were developed for each respondent.

2.2.3 Type of interview and development of questionnaires

A semi-structured format was chosen as the best type for the interviews. This format allowed for the best balance between prompting for specific responses while allowing for spontaneous narratives and lines of inquiry to develop. Discussion guides were developed in order to assist with the semi-structured interviews. The inclusion of content in the discussion guide was dictated by the limited literature on referrals to psychiatry. (Ras J et al., 2011) The discussion guides for the two respondents are included in Appendices 4 and 5.

2.2.4 Ethical oversight

Ethical approval for the study was sought from and granted by the University of Victoria Human Research Ethics Review Board. The study was granted approval under Protocol 14-052.

2.2.5 Data collection

Once ethical approval was received the field study was commenced. The field study was conducted from March until May, 2014.

2.2.5.1 Recruitment

Letters of invitation (Appendix 2) were sent to several potential participants—psychiatrists—in the mid Vancouver Island area (Comox, Nanaimo and Parksville). Letters of invitation were sent only to psychiatrists for two reasons:

1. The contact information for psychiatrists (like all physicians) is publicly available information ("British Columbia College of Physicians and Surgeons ");
2. It was anticipated that any respondent psychiatrist would then be able to provide contact information for administrators.

2.2.5.2 Conduct of the interviews

All respondents to the letters of invitation were interviewed either by telephone or at a mutually agreed-upon location. Each interview lasted approximately one hour. Data were collected in the form of field notes composed during the course of the interview; the respondents interviewed by telephone were made aware that notes were taken during the interview session. All respondents either signed consent forms (Appendix 3) or verbal consent was obtained and documented. The field notes and documentation of consent were kept in a secure location until the end of the project.

All respondents were assured of anonymity. In order to safeguard anonymity all respondents agreed to the following rules:

1. Any quotes used in the presentation of results would not be attributed to any particular respondent;
2. All respondents agreed to disclosure of general descriptors of their clinical roles provided none would be attributed to any particular participant.

As expected, the actual interviews did not proceed strictly according to the format in the questionnaires. Instead, as interviewees responded and "took the lead" in the interview various themes and narratives were explored as they arose. The discussion guides were then used by the interviewer to review the material as it was recorded and, if

needed, to assist in asking any further questions. In any event all responses were carefully recorded and when needed the documented responses were clarified or confirmed by the various interviewees.

Some respondents graciously provided additional material at their initiatives. This additional material included samples of referral forms, not yet in general use, to be used by referring sources in the community. This material was provided on the following basis:

1. Information was allowed to be abstracted from the additional material;
2. The additional material was not in any way to be reproduced in the presentation of the project;
3. The additional material was to be destroyed at the end of the project;
4. The additional material was not to be attributed to any particular respondent(s).

The request to use the material this way was honored strictly as the project was completed.

2.2.5.3 Format of field notes

As soon as possible after the interviews, the field notes were transcribed into documents suitable for qualitative software processing and analysis.

2.2.6 Qualitative data analysis

The data for the field study consisted of transcripts of field notes that recorded the responses and narratives of the respondents. The transcripts were imported into NVivo

software, and NVivo was then used as an aid for the qualitative analysis of the transcripts.

The data were analyzed for content by referring to two key questions:

1. What are the minimum criteria needed to ensure appropriateness in the context of an e-referral to psychiatry?
2. What are the information requirements needed to support an appropriate e-referral to psychiatry?

This was done by examining the data with respect to the two key questions and then developing codes for responses as they emerged from the data. After the first attempt at coding, the data were re-examined in order to refine the coding system. This process of developing codes continued in an iterative fashion by continually re-examining and refining codes until a minimum number of codes that captured all of the data were developed.

As the coding scheme developed it was decided to place the codes in a hierarchical structure. Specifically, the codes that reflected the minimum conditions to be met for appropriateness were placed at the top of the hierarchy of codes; the information requirements to meet the conditions of appropriateness were placed as sub-codes under these main codes. This was done for two reasons. First, most of the respondents provided explicit responses about the conditions for the appropriateness of referrals to psychiatry. As well, many respondents also provided responses about the types of information that they deemed as needed for an appropriate referral. As such the coding scheme for the analysis of the data developed naturally into a hierarchy.

At the end each code that was developed from analysis of the data represented either:

1. A condition necessary for appropriateness, or;
2. An information requirement necessary to support the condition.

As the data were examined for criteria of appropriateness and specific information requirements it was evident that the responses were nuanced in recurrent ways. First, one nuance that was repeatedly evident was the context of the response. At times some respondents described *explicitly* the need for certain types of information. At other times, respondents preferred to describe information needs in terms of *commonly encountered problems* with received referrals. Information needs and the criteria for appropriate e-referrals were then inferred both from explicit statements and from statements about problems with referrals.

In addition the respondents at times also indicated whether a particular type of information should be included in an e-referral on a *mandatory basis* (must be included with every referral) or be included on a *conditional basis* (might be included in the referral if triggered by a particular need). This led to further consideration of some rules, based in the data, for determining whether any particular code (as representing a particular data element) would be described as either mandatory or conditional. After examining the data the following rules were developed:

1. Mandatory: if there was general consensus among all the respondents about the need for a particular data element it was assigned the attribute *mandatory*;
2. Conditional: a code was assigned the attribute *conditional* if either of the following was supported in the data:

- a. A specific trigger that would require the data element was described explicitly, or;
- b. The data element was described by relatively few respondents and it was evident from context that a particular data element was deemed as needed by those few respondents for their own purposes.

After the data were assigned to codes, each code was then assigned an attribute of either *mandatory* or *conditional*.

The criteria for defining appropriateness and the information requirements needed to support an appropriate e-referral to psychiatry were then determined directly from the coded data and tabulated. As the coding scheme was developed by iteratively re-examining the data and refining the scheme, at the end the coding scheme itself was a direct reflection of the criteria for appropriateness and the information requirements in order ensure appropriateness. In other words, each highest level code was equivalent to a criterion for appropriateness, and each lower level code was equivalent to an information requirement needed to support a particular criterion for appropriateness. The criteria for determining appropriateness were abstracted directly from the highest level of codes in the coding hierarchy. (Note: by definition these criteria were deemed as *mandatory* inasmuch as they represented the minimum criteria needed for an e-referral to psychiatry to be regarded as appropriate). The information requirements needed to support the criteria of appropriateness and the cardinality (*mandatory* or *conditional*) were abstracted from the lower level codes in the hierarchy. The information requirements and their cardinalities were then tabulated under the criteria for appropriateness.

Finally, a model for typical workflow with conventional referrals was developed based on the responses of the interviewees. This model was based exclusively on explicit statements about the workflow for various respondents.

In summary, the qualitative data analysis proceeded as follows:

1. The data were analyzed from the perspective of the two key research questions and a coding scheme was developed—this required several iterations of re-examining the data and refining the coding scheme;
2. The data were then classified according to the emergent hierarchical coding scheme;
3. Each code was assigned an attribute of either mandatory or conditional;
4. As a result of the iterative process of developing codes and re-examining data, the coding scheme itself reflected directly both the criteria for appropriateness and the information requirements for an appropriate e-referral; results were determined by:
 - a. Abstracting the criteria for appropriateness directly from the highest level of codes;
 - b. Abstracting the information requirements needed to support an appropriate e-referral directly from lower level codes, and;
 - c. Tabulating the information requirements under each criterion for appropriateness;
5. A typical workflow model was developed based on explicit responses in the data.

2.2.7 Results validation

The results were validated both internally and externally. Internal validation was accomplished by using tools within NVivo to audit the coding of the data for consistency. External validation was accomplished by comparing the results to the information about the appropriateness of referrals to psychiatry that was available in the extant literature and by asking potential stakeholders for commentary about the tabulated results.

2.3 Environmental scan and gap analysis

An environmental scan was conducted primarily to ascertain any information models for deployed e-referral systems. These information models were used in turn to conduct a gap analysis by comparing published models with the results of this study.

2.3.1 Environmental scan

An environmental scan for e-referral clinical information models was conducted in an open-ended fashion in several steps. The literature reviewed for this project was surveyed for any references to deployed e-referral systems. In addition, online searches were conducted using a variety of search terms, again looking for any reference to a deployed e-referral system. All leads pertaining to deployed e-referral systems were searched in more detail. Finally, once there seemed to be definitive references to deployed e-referral systems, further inquiries were made pertaining to any published or publicly available clinical information models used in deployed e-referral systems. This entailed either searching a relevant website or contacting an administrator associated with such a system. Finally, organizations associated with developing standards for health IT

messaging and clinical models were also queried for any information pertaining to e-referrals. At the end of the environmental scan all available clinical information models were gathered as a resource to be used in the subsequent gap analysis.

2.3.2 Gap analysis

A gap analysis was performed by using the tabulated results from the field study as a basis of comparison to assess the suitability of the information models gathered from the environmental scan to produce an appropriate e-referral to psychiatry. The gap analysis was performed by auditing each gathered information model with respect to the question: *to what extent can this information model produce a clinical referral document that corresponds with the results of the field study?* The results were tabulated to facilitate further discussion.

2.4 Addressing the research questions

The research questions were then addressed using the results of this study.

Chapter 3

Results of the Field Study

3.1 Field study results overview

The characteristics of the respondents who participated in interviews were examined in order to ensure that they were a representative sample of stakeholders. Next, the minimum conditions for appropriateness and the minimum information requirements for an appropriate e-referral to psychiatry were determined from the analyzed data and a model of workflow as described by the respondents was developed. An information model for an appropriate e-referral to psychiatry was then developed. Finally, the results were validated.

3.2 Characteristics of the respondents

All psychiatrists or administrators who responded to the invitation were interviewed. Some respondents indicated a preference to be interviewed as individuals (either a psychiatrist or an administrator) while other respondents indicated a preference to be interviewed in a respondent format (psychiatrists and administrators together). In order to ensure anonymity, each interviewee—whether an individual or a respondent—was labeled simply as a “respondent.” Seven respondents were interviewed during the course of the fieldwork. There were six (6) individual interviews and one (1) group interview.

The respondents seemed to represent a spectrum of expertise in psychiatry. Respondents from Child and Adolescent Psychiatry, Geriatric Psychiatry and General Adult Psychiatry accepted invitations for interviews and were distributed as follows:

Child and Adolescent	3 respondents
Geriatric Psychiatry	1 respondent
General Psychiatry	3 respondents

In addition, there seemed to be a good mix of representation from both Psychiatrists and Administrators:

Psychiatrists	4 respondents
Administrators	4 respondents

As it happened the respondents had a number of elements in common. All respondents worked for mental health teams. This meant that there was a division of responsibility between administrators and psychiatrists with respect to handling the intake process for referrals. All respondents (7/7) reported that Administrators were responsible for handling the initial intake of referrals from the community. That said six out seven (6/7) respondents indicated that the Psychiatrist also participated in triage and disposition decisions once the referrals were prepared for review. Three out of seven (3/7) respondents indicated that the Psychiatrist alone handled hospital-generated referrals.

All respondents confirmed that they received referrals for psychiatry or mental health care. No respondents indicated that they had the capacity to receive referrals electronically. All respondents indicated that the vast majority of community-generated referrals were submitted to the respondents as letters (by post or fax). Some respondents (2/7) stated explicitly that verbal referrals, such as telephone calls, would be refused; the

remaining respondents (5/7) indicated some flexibility with verbal referrals but these were generally exceptions. For all respondents that provided information to the question, the overwhelming majority of referrals came from community-based family physicians.

In addition all respondents (7/7) reported the current use of some kind of electronic health record (EHR). That said there were some concerns that the EHR's lacked some function in terms of interoperability. Indeed, one respondent reported an administrative prohibition on communication with users outside the net serving its system.

Finally there were some pertinent negative responses that were common to all respondents. First, no respondent endorsed the use of electronic means to obtain more information from community based referral sources (3/7 respondents indicated they dealt with hospital- based referrals and in that case they could obtain some additional information, if needed, from the hospital associated EHR). As well, no respondent indicated any capacity to provide any kind of electronic consultation.

3.3 Results: criteria for appropriateness and information requirements

There was a remarkable consensus among the respondents with respect to the criteria for appropriateness and the information needs. As such a hierarchical coding scheme developed naturally as the data were analyzed. The coding scheme itself was then used to determine the criteria for appropriateness and the supporting information requirements. The coding scheme is illustrated in Figure 3. An explanation of the codes as coding memos is included in Appendix 5.

3.3.1 Minimum criteria for appropriateness

The minimum criteria for appropriateness were derived from the highest level of the coding hierarchy. As a result three minimum conditions to be satisfied for an appropriate e-referral to psychiatry were abstracted from the coding scheme:

1. The referral must provide evidence of a psychiatric problem.
2. The referral must ask a psychiatric question.
3. The referral must support workflow for the specific clinic.

3.3.1.1 Criterion 1: The referral must provide evidence of a psychiatric problem

Many respondents expressed dismay that a typical referral simply stated something like “this person is depressed-please see him.” The dilemma this presented to the respondents, in turn affecting workflow (see discussion below), was that a simple description like “depression” could represent anything from a brief, self-limited situational condition—and not in need of psychiatric assessment or intervention—to a severe mood disorder that might imply significant risk to the patient. Consequently, this condition was satisfied with any information that indicated that the subject of the referral had **severe and persistent** mental illness. Indeed this phrase was mentioned by more than one respondent. When elaborated, the terms were operationalized as follows:

1. Severe-meaning either symptoms severe enough to affect a person’s quality of life or day to day function;
2. Persistent-lasting long enough to meet diagnostic criteria for various types of mental illness; from another perspective, lasting long enough to ensure that the

purported mental illness is not just a situational crisis that would mandate accessing other resources.

By no means did any respondent suggest that the process of making a referral should force the referral source to make a firm diagnosis; to the contrary many respondents simply stated, either explicitly or in terms of identifying a problem, that any e-referral should contain enough information to establish that the problem was severe and persistent—as opposed to a situational crisis—and as such would fall within the mandate of psychiatry.

Some examples of data (each from a different respondent) that addressed this condition included:

- “Tertiary nature-persistent/ serious illness”(respondent 1)
- “Mandatory-symptoms and function” (respondent 3)
- “Severe and persistent mental illness vs. behavior problem” (respondent 4)
- “At a minimum- Problem statement-3 or4 pertinent symptoms, risk, severity, indication of duration” (respondent 5)
- “For mental health in general: Severity of issues, “ (respondent 6)

3.3.1.2 Criterion 2: The referral must ask a psychiatric question

Again, many respondents expressed dismay that referrals such as “this person is depressed-please see him” were troublesome in many respects due to the lack of a clear question for the psychiatrist. In this respect there was some overlap between a lack of clear expectations for the psychiatrist and workflow for the clinic. In terms of problems for the psychiatrist a lack of a clear question implied two difficulties. First, there was no focus for the letter of consultation going back to the referral source. In addition, a clear question was demanded in order to “manage expectations” in terms of what the

psychiatrist could provide in terms of service to the patient and referral source. Many respondents complained that implicit in many referrals were requests that the psychiatrist or the mental health team would assume further care and management of the patient; many respondents took pains to explain that this was not a reasonable use of relatively scarce mental health resources and that a clear question helped to “manage expectations” by facilitating a letter of consultation that would help the referral source manage the care of the patient. The overlap in terms of workflow was that in the case of a less than clear question in the referral then someone on the team—usually an Administrator—typically needed to call the referral source in order to clarify expectations. The respondents talked about two types of questions, not necessarily mutually exclusive, that would satisfy conditions for appropriateness:

1. What is the diagnosis for this patient?
2. What are the options for treatment for this patient?

Either one or both questions could be included with the referral and still be appropriate.

Some examples of data (each from a different respondent) that addressed this condition included:

- “What are the concerns? Diagnosis? Treatment options?” (respondent 7)
- “What is the reason for referral? More than 50% of referrals need clarification” (respondent 6)
- “Clear reason for referral and expectation” (respondent 5)
- “What is the problem right now?” (respondent 3)
- “Main request-a clear question” (respondent 2)

3.3.1.3 Condition 3: The referral must contain information that supports efficient workflow at the specific clinic

As it happened, this condition emerged as a central concern for all respondents.

There was some context for understanding this concern. All respondents who participated worked for mental health teams. As described the roles of the teams entailed a number of functions, varying from preparing the consult for the psychiatrist to actual treatment and follow-up of the referred patient. This implied a number of issues in terms of discussing the information needs for an appropriate e-referral. First, most respondents talked about the appropriateness of the referral for the team *as well as* the psychiatrist. Indeed, many respondents indicated that after review a referral might be directed to a non-psychiatrist clinician for further follow-up. As such, any e-referral should contain enough information in order for the team to make a decision about disposition, namely directing the referral to a treating clinician or the psychiatrist. (The respondents did indicate that, at times, treating clinicians will ask for psychiatric referrals; as this happens internally this was deemed as not appropriate to explore for the purposes of this project). Three key areas were then identified in terms of information requirements to satisfy this condition:

1. The referral must be *appropriate for the team*. This would entail information in the referral that would allow the team to judge for appropriateness in terms of the mandate of the team, e.g., age of patient, catchment area, whether the referral was a “third party” request such as a medical-legal examination for court, or whether the patient in fact needed crisis services instead of treatment and follow-up for severe and persistent mental illness.

2. The referral should *facilitate a decision around disposition*, namely sending the referred patient directly to a treating clinician, for psychiatric consultation or even to a resource outside of the clinic. Of note, some respondents emphasized that even if psychiatry was requested, it might have been more appropriate that the referral was directed to another resource either within or external to the team. In addition, many teams made decisions about the urgency around directing the referral to the right resource, typically after a secondary review of the referral including contact with the referral source to obtain more clinical information.
3. The information in the referral should help with *efficient disposition of the referral*. Many respondents claimed that poorly prepared referrals required much additional work and time, including contacting the referral source and referred patient, in order to address the decisions as discussed above.

Some examples of data that addressed this condition included:

- “Referrals usually provide little information-describe them for the most part as ‘brief’”
- “Many received referrals are marked urgent but rarely supported by accompanying clinical information”
- “if crisis related to conflict then refer them to the appropriate service”
- “there are no direct referrals to psychiatry on purpose... need to gather triage data for the second step”
- “need more clinical information in referral”
- “workflow should allow decreased preparation time, better ability to see patients”

- “Given that a referral is often just a photocopy or ‘one line’... would look through the chart for previous consults, consults from other departments...”
- “intake clinician assessment is critical as can rarely tell the psychiatric question from the physician’s referral”

As evident from the above quotes, it was noted that many of the concerns around workflow that were discussed by the respondents seemed to support not just a condition for appropriateness in terms of supporting workflow but also the conditions for demonstrating a psychiatric problem (condition 1) and asking a psychiatric question (condition 2). Given the degree of apparent overlap of the data implying a condition for supporting workflow and the other two conditions, setting a condition around supporting workflow was justified for two reasons:

1. The concern around requiring information to help with efficient workflow was mentioned sufficiently often that this seemed to justify setting it as a separate condition;
2. Most respondents also mentioned other types of information to support workflow (primarily demographic data) that seemed to be captured best under a condition about workflow.

In the end only information that was related solely to workflow—mainly demographic data and contact information—was coded as information supporting condition 3 but it was acknowledged that much of the information that supported conditions 1 and 2 also supported condition 3.

3.3.2 Minimum information requirements for an appropriate e-referral to psychiatry

The minimum information requirements to support each condition were abstracted from the coded data. Any data element was regarded as required if there was general consensus among the respondents about the need for the element. A data element was also coded with the attribute of “mandatory” if most respondents required it; else, it was coded with the attribute of “conditional” and reasons for the conditional nature were abstracted from the data.

3.3.2.1 Information requirements for condition 1: evidence of a psychiatric problem

There was broad consensus among the respondents about the need for information about current problems:

Table 1: data elements --current problems

Data Element	Cardinality	Notes
Current symptoms	Mandatory	Describe a few symptoms-quantify if possible
Current function	Mandatory	Complete a brief standardized questionnaire or describe some limitation in function-quantify if possible
Substance use	Mandatory	Some respondents suggested including even if substance use is not problematic

Urgency	Mandatory	Generally this was interpreted as providing evidence one way or the other about risk of harm of the patient to himself or others (suicidal thoughts or the potential to harm others). Generally this was not thought to capture severe alteration in function; that should be captured under data re: current function; some respondents stated that this should “not be a ticky box” but should include meaningful information
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There was also broad consensus about the need for any information about past problems, although for the most part the need was identified as conditional:

Table 2: data elements-past problems

Data Element	Cardinality	Notes
Family history	Conditional	For all respondents this was requested if deemed relevant by the referral source
Medical history	Conditional	For some respondents this was deemed as needed due to the type of practice; for other respondents this was requested if deemed relevant by the referral source

Social history	Conditional	For some respondents this was deemed as needed due to the type of practice; for other respondents this was requested if deemed relevant by the referral source
Laboratory results	Conditional	For some respondents this was deemed as needed due to the type of practice; for other respondents this was requested if deemed relevant by the referral source
Treatment history	Conditional	For some respondents this was deemed as needed due to the type of practice; for other respondents this was requested if deemed relevant by the referral source

Notes: treatment history could include information such as medications used/ results, copies of previous psychiatric consults, records of inpatient assessment/ treatment.

3.3.2.2 Information requirements for condition 2: referral question

There was consensus on the need for a referral question but less so around the need for information about the expectations from the referral; as such, this was reflected in the cardinality (mandatory or conditional) assigned to each data element:

Table 3: data elements-referral question

Data Element	Cardinality	Notes
What are your treatment recommendations for this patient AND/OR What is your diagnostic impression of this patient?	mandatory	The referring source could be presented simply with a choice of questions. There was some indication that the referral source should be able to elaborate on the question in order to answer the implied question “why see this patient now? E.g. Please see for treatment recommendations-patient has not responded to several medications E.g. I think this patient has diagnosis X but has not responded to treatment-what is the diagnosis?
What are your expectations in referring this patient to psychiatry?	Conditional	For some respondents this would be required information in terms of workflow decisions regarding disposition of the referral.

3.3.2.3 Information requirements for condition 3: support of workflow

Again there was broad consensus about the need for data to support workflow:

Table 4: data elements-support of workflow

Datum	Cardinality	Notes
Is patient aware of this referral?	conditional	Some respondents indicated that this is a problem area i.e. patients are contacted about possible appointments but deny knowledge the referral source has in fact sent referral
Is this a consult for a third party?	mandatory	For most respondents this was critical information in determining disposition of the referral
Contact information	mandatory	Although all respondents talked about the need for accurate and up to date contact information, there was no broad consensus about specific types of information under Contact information-data elements could include addresses, telephone numbers, next of kin/ parents-as such the specific data elements under contact information were deemed as conditional

Demographic information	mandatory	Although all respondents talked about the need for demographic data there was no broad consensus about specific types of information under Demographic information- data elements could include date of birth, billing information, aboriginal status, current living arrangements if in foster care-as such the specific data elements under demographic information were deemed as conditional
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3.4 Data validation

The tabulated data elements representing the minimum information requirements for an appropriate e-referral to psychiatry were validated internally by using tools with NVivo, and externally by checking the results against the extant literature and by requesting commentary from respondents that agreed to provide feedback about the provisional results.

3.4.1 Internal validation

Tools available within NVivo were used to audit the results and check for internal validity. First, all sources were checked to ensure that the textual data were all assigned to codes. This was done by visual inspection using NVivo's "coding stripes." After inspection no data appeared to be uncoded.

Next, the results were checked to ensure that there was consensus among the respondents in terms of support for the conditions of appropriateness and information requirements. This was done using NVivo's "matrix query" tool. This tool was used to check the number of respondents who discussed a condition or information requirement for any given corresponding code; the results were presented as a small table or "matrix." The following results were generated:

Table 5: Number of respondents vs. conditions of appropriateness

Code	Number of Respondents
Psychproblem	7
Psychquestion	7
Workflow	7

Table 6: Number of respondents vs. Psychproblem and sub-codes

Code	Number of Respondents
Psychproblem	7
Current	7
symptoms	4
function	6

substance	3
urgency	6
past	7
famhist	6
medhist	6
sochist	2
treat	7
lab	3

Table 7: Number of respondents vs. Psychquestion and sub-codes

Code	Number of Respondents
Psychquestion	7
expectations	7
question	5

Table 8: Number of respondents vs. Workflow and sub-codes

Code	Number of Respondents
Workflow	7
3 rd _party	3
Contact	2
Address	4
Tel_num	3
Demographic	7
Ab_status	1
dob	7
Living_arr	3
name	2
phn	4
Patient_aware	2

The audit confirmed that there was broad consensus for the conditions and the general information requirements to support these conditions; as such these were deemed mandatory. There was less consensus around more specific information requirements; as such these were deemed as conditional.

3.4.2 External validation-check against literature

A few articles that discussed audits of appropriateness of conventional referrals to psychiatry were found. These articles described the audit criteria in terms of expected information within the letters of referral in varying detail. These articles were used to provide one means of validation of the data elements derived from the field study. First, Moselhy talked about an audit of referral letters in Saudi Arabia. He looked at a number of expected elements in letters of referral. The following were found to be consistent with the data elements determined by the field study:

- Basic demographic information, including age, gender, marital status
- Presumed diagnosis, mental state, symptomatology-consistent with evidence of a current psychiatric difficulty
- “Reason of referral”
- Past psychiatric history, treatment given, life events and difficulties, consistent with evidence of past problems
- Family history of psychiatric difficulties
- Past medical history
- Degree of urgency

Moselhy (Moselhy & Salem, 2009) also mentioned religion but this was not identified as a required element by the study.

Ras (Ras J et al., 2011) examined the appropriateness of referral letters to a state psychiatric facility in South Africa. Although he conceded that many of the referrals

seemed appropriate because most of the referred patients were either accepted into hospital or for secondary care, he lamented that many letters missed vital information such as a presumed diagnosis (consistent with evidence of a psychiatric problem), lack of a reason for the referral (consistent with the need for a psychiatric question) as well as a lack of information about treatment history, substance abuse and other medical conditions—all consistent with some of the data elements derived from the field study. Ras did not talk about any missing elements that were not captured by the field study. (Ras J et al., 2011)

Cubbin (Cubbin S et al., 2000) talked about the appropriateness of urgent referrals to an outpatient clinic. Appropriateness (in terms of justification for an urgent referral) was assessed strictly by an expert's opinion using a visual analogue scale. Although specific data elements were not discussed, Cubbin did describe inappropriate referrals as containing little clinical information to guide the consultant; this seemed to be consistent with the data elements supporting the condition of describing a psychiatric difficulty.

Finally, Al-Amri (Hasan S. Al-Amri & Al-Gelban, 2002) also looked at referral letters to a psychiatric hospital in Saudi Arabia. He audited letters for the following content:

- General information
- Chief complaint
- History of present illness
- Medical history
- Past psychiatric history
- Relevant personal information
- Mental status
- Physical examination
- Lab investigation
- Medical diagnosis

- Medical treatment
- Formulation
- Psychiatric diagnosis
- Psychiatric treatment
- Cause of referral
- Eligibility of writing (*presumably legibility of writing*)

Although these terms were presented without additional explanation, by any reasonable interpretations of their meanings they seemed broadly consistent with many of the data elements derived from the field study.

Overall the extant literature on appropriate referrals to psychiatry seemed to validate the findings of the study by virtue of general consistency between data elements discussed in the articles and data elements derived by the field study.

3.4.3 External validation-comparison to available referrals to psychiatry

Two referral forms ("BC Mental Health "; "Outpatient Referral Form "), both in the public domain, were found for psychiatric services in British Columbia and were also used for external validation of the results of the field study. Both of these forms requested similar information to the results of the field study. It was not clear from the forms, however, how the need for various types of information would be enforced.

3.4.4 External validation-request for comments by the respondents

The respondents were invited to submit commentary about the results of the field study. Upon follow up, some respondents were not available due to relocation. Four respondents were eventually contacted; three respondents provided comments about the results of the field study. The three respondents who commented all unequivocally

endorsed the results as valid as presented in the information model subsequently described (Figure 4).

3.5.5 External validation-results

Overall, a comparison of the results of the field study to external sources and comments from three respondents seemed to validate the results of the field study at one level. Specifically, the information requirements to support the conditions around demonstrating a psychiatric problem and including a reason for the referral were validated. In addition the need for contact information and demographic information was validated in general; based both on the internal validation and the comparison with external sources there seemed to be less consensus around the need for specific types of information that should be included with contact and demographic information. As a result it was concluded that an information model for an appropriate *referral* to psychiatry must have a mandatory framework of information requirements, including information that demonstrates a psychiatric problem, a reason for the referral, contact and demographic information; more specific types of information seemed to depend on the context of the needs of various clinics. The concept of an *e-referral* that has a framework of mandatory data elements along with some conditional data elements—all potentially enforceable by an IT solution-- was used to construct the final information model for this project.

3.5 Information model --an appropriate e-referral to psychiatry

After validation of the results an information model for an appropriate e-referral to psychiatry was developed (Figure 4). The model included the mandatory data elements as determined by the field study and as subsequently validated. The model also included the conditional data elements as suggested by the results of the field study as well as conditional data elements suggested by external sources. This model was used to address the remaining research questions.

3.6 A model of typical workflow with conventional referrals

All the respondents were asked about typical workflow based on referrals as received. All respondents (7/7) indicated that they received referrals mostly in the form of letters. When explored, most respondents indicated that typical workflow involved contacting either or both the referral source or referred patient in order to obtain more information or to clarify many aspects of the referral such as the reason for the referral and the patient's contact information. In addition, all respondents indicated that once there was sufficient information the disposition of the referral was decided, typically by some kind of committee. It was possible to identify several key junctures in the workflow in terms of initial steps in dealing with the referral, contacting patients or referral sources in order to obtain more information and then finishing with the final decision about disposition. These junctures were coded under the *workflow_model* hierarchy. There seemed to be general consensus about the typical junctures in the workflow. This was validated by a matrix query in NVivo:

Table 9: Workflow code vs. number of respondents

Code	Number of Respondents
Workflow_model	7
Decide	5
Obtain_from	6
Obtain_what	5
Obtained_by	3
Received_by	6

Once validated a flow chart that reflected the general pattern of workflow as described by the respondents was developed (Figure 5).

3.7 Final results of the field study

The information model for an appropriate e-referral to psychiatry (Figure 4) and the model of typical workflow (Figure 5) were the final results of the field study. These were used to address some of the research questions as discussed in the following chapters.

Chapter 4

Results of the Environmental Scan and Gap Analysis

4.1 Environmental Scan-Overall Results

An environmental scan for current e-referral deployments was performed continuously during the course of this study. The scan was completed on February 5 2016. The scan was conducted by using open-ended and flexible methodology. Specifically, as literature was gathered for review any references to current e-referral deployments were noted. In addition, several on-line searches were performed using a variety of search terms. Any leads about current e-referral deployments gleaned from the literature or on-line searches were investigated further. The scan was not limited to current deployments as such; in addition resources such as HL7 ("HL7/ FIHR referral request,") and openEHR ("openEHR request for service,") were queried for any published standards pertaining to e-referrals. The environmental scan was concluded both to ensure a timely preparation of this report as well as due to the impression that no new information pertaining to e-referral deployments was forthcoming by the time the scan was concluded.

During the course of the environmental scan two key references were identified. First, Naseriasl and colleagues (Naseriasl et al., 2015) provided an excellent, relatively up to date survey of current deployments around the world. In addition, Liddy's scan of the situation in Canada (Liddy), available from the COACH website, provided a current view of the situation in Canada. Apart from providing a comprehensive summary in one reference, the information contained in each reference correlated well with the results of

the search overall and imparted confidence that no new e-referral deployments would be found. Intriguingly, although each reference was published recently when leads in the references were investigated further there was evidence that the environment for e-referrals is decidedly “in flux;” this will be discussed further in a subsequent section (4.1.1).

In addition, within the scope of resources available for this study some administrators for some e-referral deployments were contacted for additional information. One administrator from Manitoba agreed to an interview; this is described in a subsequent section (4.1.2).

The ultimate aim of the environmental scan was to identify e-referral deployments that published or otherwise made available standards for the content of e-referrals. At the end four sets of standards were accessed and used for the gap analysis; the final results of the environmental scan will be described in a subsequent section (4.1.3).

It is acknowledged that there was a limitation to the results of the environmental scan for e-referrals. Some sites required paid subscription or specific authorization in order to access some information pertaining to specific e-referral deployments. While it was not clear whether these sites had published standards for the information content of e-referrals nonetheless these sites were not accessible within the resources available for this project and as such represent a potential limitation to the results.

4.1.1 Environmental Scan-Themes

Although not the intended aim of the environmental scan, some interesting themes emerged during the course of the scan. These themes were noted as they seemed germane to the overall discussion about e-referrals for this research project.

First, it was less than clear whether many (if not most) e-referral systems insisted on some information content in the actual e-referral. Despite searching there was a paucity of explicit references to information content for e-referrals; instead, there were implicit references to unstructured information content. For example, the new National Health Service e-referral system seemed to focus on the functionality for the patient to make the appointment with the specialist, with only a reference to the “appointment letter” sent by the referring physician to the specialist. (“NHS e-referral ”) By way of contrast, the e-referral system developed by the San Francisco General Hospital seemed to rely upon the ability of the referring and specialist physicians to communicate electronically ahead of the actual referral in order to sort out information needed to proceed with the appointment. (“SFGH e-referral ”) Certainly there did not seem to be any consensus about the need to ensure information content in a submitted e-referral. If anything, the consensus seemed to revolve around a need for efficiency although overall this was a poorly described organizing concept.

Second, at best the current situation for the actual deployment and use of e-referrals seemed to be in flux. This was evident after further investigation into two systems. First, the “Choose and Book” system as described in Naseriasl’s recent paper (Naseriasl et al., 2015) was changed last summer to the “NHS e-Referral Service.”

("NHS e-referral ") This was not investigated any further. In addition, the e-referral system in Manitoba was just recently put on hold due to lack of use (personal communication-please see below) despite a description in a relatively recent reference. (Liddy) Although these two changes were noted incidentally during the conduct of the environmental scan it does raise a question about the reliability of any relatively recent information about e-referral deployments.

Finally, and perhaps not surprisingly, current e-referral systems seemed to vary widely with each other with respect to several parameters. There were some references to the relatively slow adoption of e-referrals even in jurisdictions that had arguably pioneered the use of such systems. This was certainly the case for Denmark. ("Medcom e-referral report,") Although a bit dated this report mentioned that some referring physicians still preferred "paper methods" for submitting referrals despite a system that had operated for several years. On the other hand, some references talked about an enthusiastic use of an e-referral system, albeit in a geographically limited jurisdiction. (Fischer et al., 2010; "SFGH e-referral ") E-referral systems also seemed to be at various levels of development and "maturity." At one end, Denmark represents a mature system; on the other end, Alberta is just starting to use e-referrals for a limited number of clinical conditions. ("Alberta netcare e-referral ") Intriguingly, Alberta did publish information pertaining to appropriate reference language to be used in some e-referrals. ("Alberta reasons for referral,") If nothing else this inconsistent landscape raised the potential for a number of research questions around the development and deployment of e-referrals.

4.1.2 Environmental Scan-Interview with an Administrator

The administrator of one system agreed to an interview as part of the environmental scan for e-referrals.

On November 13, 2015, Ms. Administrator of Manitoba eHealth was interviewed by telephone for 30 minutes. Ms. Administrator² was made aware of the nature of this research project and she consented to be mentioned and referenced in the report for this project.

Ms. Administrator was gracious and helpful in addressing many questions. To start she identified herself as the administrator of the e-referral project known as “Bridging Generalist to Specialist Care” in Manitoba. She indicated as well that the impetus for the project was in terms of a business decision—primarily, this involved the perceived need to track referrals in order to manage the deployment of specialist services in the province.

Ms. Administrator also described briefly the functionality of the system. The e-referral system was designed in-house (Manitoba eHealth owns the code) to be used either with existing electronic medical record systems or it could be accessed by a web portal. In some cases it had the functionality of autopopulating some fields (e.g. patient demographic data).

² Ms. Administrator is a pseudonym; in keeping with ethical guidelines the actual name of the individual is not mentioned in this report.

Ms. Administrator was asked about information requirements for the specific e-referral system. In turn she indicated that embedded within the system were clinical guidelines or “pathways” that guided a referring physician in terms of assessing the appropriateness of the referral and, to some extent, the information needed to complete the referral. Ms. Administrator also indicated that these pathways were derived by expert consensus (generalist and specialist physicians were surveyed). She described one pathway around low back pain as an example. Ms. Administrator was not aware of any pathways specific for mental health.

Ms. Administrator indicated that within the process of development specialists could insist that certain types of information be included with specific types of referrals. She indicated further that the functionality of the system included drop-down lists that were intended to assist the referring physician in completing the referral; she further stated that there was a limited ability to “tweak” the drop down lists dependent upon the context of the referral. Ms. Administrator stated that adding new types of referrals was a “challenge” and as such there was a mixture of mandatory and optional questions to be completed by the referring physician. Finally, Ms. Administrator indicated that all submitted referrals had the capacity for “free form text” although she was not aware of any data around rates of use of this function.

Finally, Ms. Administrator indicated that some referring physicians printed the “pathways” as a reference to be used with associated referrals. Apart from that comment it was less than clear how the pathways were integrated into any electronic health record work flow.

On November 27 2015 Ms. Administrator graciously provided an update:

“I also wanted to let you know that we did recently make the difficult decision to suspend the eReferral system as there have been challenges associated with the functionality resulting in low utilization of the service. We recognize the value of an eReferral system so the need for an electronic referral solution remains within our strategy.” (Personal communication)

Ms. Administrator provided some important context to understand and interpret the results of this study; her contribution is gratefully acknowledged.

4.1.3 Environmental Scan-Final Results

At the end of the environmental scan four sources of published standards³ for information content in e-referrals were identified:

1. HL7-The HL7.org organization had a number of proposed standards⁴; the most complete seemed to be the module published in the Fast Healthcare Interoperability Resources section ("HL7/ FIHR referral request,"); the most recently submitted resource was chosen. Accompanying documentation indicated that this standard was to be used as a module in building a clinical document; as such, for the purpose of the audit the HL7 website was queried for standards pertaining to data elements corresponding to the results of the field study.

³ Due to unclear copyright rules the actual standards are not reproduced in the text of this report. The standards are available for inspection per the cited references. For the purpose of this report, elements in each standard will be discussed in a manner that respects copyright.

⁴ HL7.org has also published a v3 class diagram for a Billable Clinical Service referral; pending clarification of copyright restrictions this standard will not be discussed.

2. openEHR-this organization published a “referral request” ("openEHR request for service,") that could function as a request for consultation. As this appeared to be “modular” the website was also queried for additional data elements.
3. eHealth Ontario -after registration this agency permitted access to published standards for e-referrals, including information content ("eHealth Ontario e-referral ").
4. National E-Health Transition Authority (NEHTA)-based in Australia, after registration this agency permitted access to published standards for e-referrals including information content ("NEHTA e-referral ").

These four sources were used in conducting the gap analysis by comparing their published standards to the information needs as determined by the field study; the results of the gap analysis are presented below.

4.2 Gap Analysis-Results

The gap analysis proceeded along several lines of inquiry. First, each gathered standard was checked to verify that, in fact, it could be used to submit a request for consultation. Next, each standard was checked against the information requirements to support the three criteria for an appropriate e-referral to psychiatry, namely that each standard had data elements that could be used, modified or constrained in such a way so to meet the information requirements for each condition of appropriateness; clearly missing data elements were noted. Finally, each gathered standard was assessed for its suitability to produce an appropriate e-referral to psychiatry based on the lines of inquiry in the gap analysis.

Due to unclear rules around copyright for each standard, individual data elements in each standard were neither mentioned nor reproduced in the text of this report.

4.2.1 Gap Analysis-Verification of case use

Each audited standard had a clear statement about intended use and made a specific reference for use in the case of referral for consultation. No audited standard mentioned any exclusions for any use case. As such each audited standard was verified for potential use in the special case of referral for psychiatric consultation.

4.2.2 Gap Analysis: Audit for specific data elements

As the gathered information models were audited by comparison to the results of the field study a code was developed in order to tabulate the results. The availability of the comparison data elements in the audited information models were represented in the tabulated results according to following codes:

1. **Y: definitely present;** this code entailed no apparent need to modify, constrain or adapt a data element.
2. **P: possibly present;** this was a broad code and entailed data elements that could be constrained, made mandatory or modified to correspond with the empirically derived data elements.
3. **N: not present;** this code entailed data elements that were clearly missing and in addition it did not seem possible to adapt the audited information model without organizational support.

4.2.2.1 Gap Analysis: The referral must provide evidence of a psychiatric problem

The gathered standards were assessed for data elements that could be used, modified or constrained to correspond with the data elements tabulated in Tables 1 and 2.

The results were tabulated as follows:

Table 10: Audit of data elements in gathered standards for current problem

Datum	HL7	openEHR	eHealth Ontario	NEHTA
Current symptoms	p¹	p¹	p¹	p¹
Current function	p¹	p¹	p¹	p¹
Substance use	p²	p²	N	N
Urgency	Y	Y	N	N

Notes:

1. Many of the standards had generic data elements in which to describe the problem(s) and reason for referral; as the cardinality was not always specified then it was deemed possible to constrain/ modify/repeat these elements in order to correspond with the comparison data elements. In addition there was capacity to attach documentation that, conceivably, could be prepared according to the results of this study so again these were deemed as possible.
2. There was no indication in these standards that this data element could not be included in a clinical document so it was deemed possible.

Table 11: Audit of data elements in gathered standards for past problems

Datum	HL7	openEHR	eHealth Ontario	NEHTA
Family history	p¹	p²	Y	N
Medical history	Y	p²	Y	Y
Social history	N³	p²	Y	N
Laboratory results	Y	p²	Y	Y
Treatment history	Y	p²	Y	N

Notes:

1. There appeared to be several ways to integrate this as a data element.
2. The “modular” nature of this standard seemed to allow construction of a clinical document for a particular context so all data elements were deemed possible.
3. Despite extensive searching there did not appear to be a suitable data element.

4.2.2.2 Gap Analysis: The referral must ask a psychiatric question

The gathered standards were assessed for data elements that could be used, modified or constrained to correspond with the data elements tabulated in Table 3. The results were tabulated as follows:

Table 12: Audit of data elements in gathered standards for referral question

Datum	HL7	openEHR	eHealth Ontario	NEHTA
What are your treatment recommendations AND/OR what is your diagnostic impression?	p¹	p¹	p¹	p¹
What are your expectations in referring this patient?	N²	N²	N²	N²

Notes:

1. Given the generic nature of these elements as published it seemed possible to constrain or modify them so they were deemed possible.
2. Although conceivably this could be captured in the generic elements capturing a description of the referral, given that some respondents in the field study indicated this as a critical flag and that there did not seem to be a corresponding discrete data element in the published standards then this was deemed as not present.

4.2.2.3 Gap Analysis: The referral must support workflow

The standards were assessed for data elements that could be used, modified or constrained to correspond with the data elements tabulated in Table 4. The results were tabulated as follows:

Table 13: audit of data elements in gathered standards for workflow support

Datum	HL7	openEHR	eHealth Ontario	NEHTA
Is patient aware of this referral?	N ¹	N ¹	N ¹	N ¹
Is this a consult for a third party?	N ¹	N ¹	N ¹	N ¹
Contact information	Y	P ²	Y	Y
Demographic information	Y ³	Y ³	Y ³	Y ³

Notes:

1. Although conceivably these could be captured in the generic elements containing a description of the referral, given that some respondents in the field study indicated these as a critical flags and that there did not seem to be corresponding discrete data element in the published standards then these were deemed as not present.
2. It was not clear from the website to what extent this could be a specific data element; overall it seemed to merit a code of possible.
3. The sub-codes for this data element were clearly present in all the audited standards; for brevity they were tabulated under just “Demographic information.”

4.2.3 Gap Analysis: Final Results

A few themes emerged upon inspection of the tabulated results of the gap analysis. First, on the whole all the gathered standards seemed to have the capacity to conform for the most part to the empirically derived information model derived from the

field study. That said it is acknowledged that a “possible” correspondence for some data elements does not imply a practical or straightforward implementation as such; there may in fact be organizational or other enterprise concerns that would impede a straightforward use of these published standards for an e-referral to psychiatry as informed by the results of the field study.

Second, arguably the more “mature” or developed standards (NEHTA and eHealth Ontario) seemed to be the poorest fits for the empirically derived information model. The reasons for this observation were not immediately evident from the gap analysis.

Finally, it was noted that some key items identified in the field study did not seem to be represented at all in the gathered standards. The implications of these themes will be discussed further in subsequent sections.

Chapter 5

Discussion and Conclusions

5.1 Introduction

The empirically derived results of the field study, environmental scan and gap analysis were used to address the research questions as outlined in section 2.1. The results of this study were also assessed in terms of some of the broader concerns about e-referrals that were raised in the introduction to this study. Finally, conclusions were formulated based on the results of the empirical research and discussion.

5.2 Addressing the research questions

The empirically derived and validated information model for an e-referral to psychiatry, based on the respondents' notions of appropriateness, was used as the basis to address the research questions (section 2.1) posed at the outset of the field study.

5.2.1 Question 1: What are the minimum criteria that must be satisfied in order for a referral to psychiatry to be deemed as appropriate?

The respondents in the field study were remarkably clear and in agreement about three conditions for the appropriateness of any referral to psychiatry irrespective of the means of delivery of the referral (electronic or otherwise):

1. The referral must provide evidence of a psychiatric problem.
2. The referral must ask a psychiatric question.
3. The referral must contain information that supports efficient workflow at the specific clinic.

Although these conditions seemed straightforward in terms of operationalizing a notion of appropriateness in the context of referring to psychiatry nonetheless they merited some further interpretation in terms of assessing their reasonableness as criteria.

First, the idea that a referral must provide evidence of a psychiatric problem seemed to address the respondents' concerns that patients should *not* be referred for consultation around a crisis. Put another way, most psychiatric illness typically is chronic and impairing for a patient. (Schinnar, Rothbard, Kanter, & Jung, 1990) This is captured in the phrase "persistent and severe" as stated specifically by some of the respondents. Furthermore, "persistent and severe" would mean that the psychiatric illness is chronic ("persistent" and not necessarily self-limited) and impairing to the point of causing the patient ongoing distress or impairment in day to day function ("severe"); it was not meant to imply that any given patient's psychiatric illness be at a sufficient threshold of chronicity or severity in order to trigger an appropriate request for psychiatric consultation. In contradistinction, a crisis—typically defined as an inability to cope with an acutely stressful situation—typically would demand entirely different care (Johnson et al., 2005) and as such would not be characterized as "persistent and severe." Given that psychiatric illness is typically chronic and impairing then manifestly this would seem to be a reasonable criterion for assessing the appropriateness of a referral to psychiatry, namely that the patient does have an illness within the scope of psychiatric expertise.

Second, the notion that any appropriate referral to psychiatry must ask a psychiatric question seemed to be reasonable when interpreted in another context, namely the requirements for appropriateness in requests for *cognitive consults* in general. There

seemed to be some support in the literature (C. B. Forrest, 2009) that requests for consultation can be classified either as:

1. Cognitive consults—a request for an opinion about a patient;
2. Procedural consults—a request for a patient to undergo a particular procedure or service.

Clearly, a psychiatrist would provide a cognitive consult. Manifestly then there would be a need for a focus in such a consult by addressing the question “an opinion about what?” In the case of psychiatry this would seem to be a question about diagnosis or treatment for the most part. Even if this is arguably self-evident, there was also some support in the literature that requests for such cognitive consults often lacked the focus of a question for the consultant. (Hasan S. Al-Amri & Al-Gelban, 2002; Ras J et al., 2011) At the end this criterion also seemed to be reasonable in terms of assessing the appropriateness of a referral to psychiatry.

Finally, the third criterion seemed reasonable just in terms of the data provided by the respondents in the field study. As discussed in the results section, all respondents indicated that any referral must contain sufficient information in order to decide on the next steps in the consultative process. Such steps might include decisions about the disposition of the request for consultation based on consideration of the specific mandate of the clinic and in a recursive way this could only be assessed once enough information has been obtained. Moreover a key word in this criterion is “efficient.” Many respondents saw the need to obtain more information as inefficient. It followed then that a referral with sufficient information eliminates this need to chase after additional information and

in turn would support efficient workflow at the given clinic and justify it as a reasonable criterion in the context of this study.

Overall, the three criteria for assessing the appropriateness of referrals to psychiatry seemed to be justified and reasonable.

5.2.2 Question 2: Given the minimum criteria for an appropriate referral to psychiatry, then what are the minimum information requirements needed to satisfy the criteria for an appropriate referral to psychiatry?

Again, the respondents provided clear data to answer this question and the results are summarized in Tables 1-4 and Figure 4. Given the validation of the results and the confidence in the criteria for appropriateness linked to these data elements then indeed the results as tabulated seemed to be the minimum information requirements for a referral to psychiatry. Even so there were few points of discussion arising from an inspection of the results.

First, the overall impression was that the minimum data set as derived from the field study presented, so to speak, the need for “a lot of information.” In response, it is submitted that the idea of a minimum data set must be defined according to the needs of the stakeholders—as in the case of this study—even if the minimum data set still seemed to entail a relatively large amount of information.

In addition it was noted that some of the data elements were deemed as conditional and would be included only if triggered by a particular need, based either on the clinical presentation or the workflow need of a specific clinic. As such the minimum information requirements should be regarded as a scheme for a reference set of data

elements that would or could be used in generating a referral to psychiatry that contains the requisite information under a given set of conditions.

Overall the minimum information requirements for an information model to support an appropriate referral to psychiatry seemed to be well established by the validated results of this study. The implications of the seemingly large amount of information required and the notion of the requirements as a reference set of data elements will be discussed below.

5.2.3 Question 3: Given an information model based on the minimum information requirements for an appropriate referral to psychiatry then what does this imply for IT implementation in terms of delivering an appropriate e-referral to psychiatry?

There was surprisingly little evidence adduced during the course of the study that addressed this question in particular. That said some notion about preferred IT implementations in the context of this study could be inferred from the data provided by the respondents.

In essence all the respondents seemed to imply that they preferred to receive *information-complete* (i.e. a document that has all the required information) referrals that would facilitate taking the next steps in terms of deciding on the disposition of the referral. This inference seemed justified based on a number of considerations in the data, including explicit statements about inefficient workflow (no respondent saw any inherent value in contacting the referral source for more information), the actual templates for proposed referral forms submitted by respondents (these were intended to be information-complete documents) and that as a theme all respondents talked about referrals as complete and stand-alone documents. At the end it seemed reasonable to conclude that

the main design requirement for the respondents in the study would be to ensure that any IT implementation for an e-referral would deliver an information-complete clinical document with no routine need to query the referral source for additional information. Intriguingly the implied requirement that in this particular context an e-referral system should deliver an information-complete document was an outcome that varied from reports in the literature about reportedly successful e-referral systems; this will be discussed further in a subsequent section.

Conceivably, there are a number of potential solutions for an IT implementation that would deliver an information-complete document. For example, at a minimum integrity checks could be included within the e-referral system to ensure that all relevant fields are completed before submission of the document. These integrity checks would either be inherent to the system in the case of mandatory fields, or included according to context for conditional fields. In this sense the information model as a reference set of data fields could be constrained according to context. At a different level of abstraction, the context for the e-referral clinical document would be determined at a systemic level either by the nature of the referral (e.g. child and youth vs geriatric referral) or by knowledge of the intended destination for the document (referring to a specific clinic would in turn automatically generate constraints on the information elements). Although any in depth examination of design considerations were not within the scope of this study nonetheless this type of thought experiment demonstrated that delivering an information-complete clinical referral document was at least feasible. As such, it was reasonable to conclude that within the context of this study the primary design requirement was for an

e-referral to be delivered as a complete clinical document with no anticipated need to solicit any further information.

5.2.4 Question 4: How well do current standards meet the needs for appropriate e-referrals to psychiatry?

This question was addressed by assessing the results of the environmental scan/gap analysis in terms of the information requirements identified by the field study and in terms of the implied design consideration as discussed above.

First, at best there seemed to be limited capacity in the gathered standards to include all of the information requirements as determined by the field study. There seemed to be more scope for including the required data elements in the standards that functioned as “building blocks” for a clinical document (HL7 and openEHR). The standards already intended for implementation as such (eHealth Ontario and NEHTA) had less apparent scope to include the requisite data elements. It was also less than clear how the gathered standards could be adapted—if at all—to include the required data elements. Certainly HL7 and openEHR have published processes for using and adapting these standards for a particular context; even so it was not clear whether the process of using these standards would work in this instance as testing these standards (HL7 and openEHR) was not within the scope of this study. It was more evident that the eHealth Ontario and NEHTA standards could not be readily adapted to include the data elements as determined by the field study. There were two reasons that justified this conclusion. First, as published both the eHealth Ontario and NEHTA standards were intended to be used “as is,” with no published indication of any means to adapt them for a particular use. In addition, the eHealth Ontario standard proposed a business case and resultant IT

solution that did not seem invested in delivering an information-complete document; this is discussed further below, but in terms of assessing the ability of the gathered standards to support the information content of an appropriate e-referral in the context of this study clearly the business case for the eHealth Ontario model did not support delivering information-complete documents and as such supported the conclusion that this standard in particular could likely not be adapted for use in the context of this study. Overall, it seemed to be the case that current standards were at best problematic in terms of supporting the information content for appropriate e-referrals to psychiatry.

In addition, the gathered standards were also problematic in terms of supporting the IT design requirement of delivering an information-complete clinical document as discussed above. Arguably, the HL7 and openEHR standards could be developed in such a way as to produce an information-complete document irrespective of the method of delivery; as this process of development was not assessed (out of scope for this study) this proposition could not be assessed any further. It was clearer that the other two standards, and the eHealth Ontario standard in particular, would not support an IT implementation based on the primary design requirement determined by this study. The eHealth Ontario standard's business case centered on the capacity of the system to exchange messages in order to fulfill the information requirements of the referral. As described by the published use cases in the standard these messages could be generated automatically (machine to machine), information could be requested by the recipient of the referral, or the messages could be exchanged through a "referral service" or directly between referral source and recipient. Regardless, the implication was that the standard was not intended to deliver information-complete documents as such. It therefore seems

reasonable to conclude that current standards overall would not meet the needs of an appropriate e-referral within the context of this study either for information content or IT implementation.

5.2.5 Question 5: What does an appropriate e-referral to psychiatry offer in terms of potential benefits to the current practice of referring to psychiatry?

In order to address this question an appropriate e-referral was defined in the context of this study, namely that an appropriate e-referral would meet the conditions of appropriateness and would contain the required information as implied by the conditions. Proceeding on this basis there seemed to be some potential but immediately realizable benefits as well as some possible or speculative benefits.

First, it seemed clear that receiving an information-complete referral would improve the efficiency of the process. Indeed this was addressed directly by the respondents in the study. Many respondents lamented that much time was in effect wasted by the need to pursue needed information from the referral source or even the subject of the referral. The potential for this improvement in efficiency was illustrated in Figure 5. The shaded area represents the “wasted” effort of obtaining information that, ideally, should have been delivered in the referral document. It was evident that an information-complete referral document would eliminate the work-flow steps in the shaded area *almost entirely*. In asserting this it is acknowledged that there may be unforeseen situations that still require the need to solicit additional information; given that the need as described by the respondents involved soliciting information that should be contained in the referral document then it is a reasonable assertion that the workflow steps in the shaded area of Figure 5 would be bypassed for the most part with exception

of uncommon and unforeseen circumstances—in other words efficiency would be realized by the assertion that the steps in the shaded area of Figure 5 would be eliminated *almost entirely*. In turn, efficiency would be realized further by a more rapid decision and disposition of the referral.

It was not clear whether efficient processing of the referral as facilitated by an appropriate clinical referral document would necessarily translate into improved patient care or better outcomes overall. It was tempting to speculate that a faster disposition of the referral would lead to reduced wait times for the appropriate resource but any discussion around this point was confounded by a number of considerations. Primarily, wait times are determined by a number of variables (Carriere & Sanmartin, 2010), including the availability of the appropriate resources in the first place. As these variables were not assessed within the scope of this study this point will not be addressed at all except to make the point that adding efficiency at the start of the process may in turn generate efficiencies (or just unmask inefficiencies) in other parts of the referral process.

Conceivably an information-complete referral document may impart some other, less tangible, benefits. As a thought experiment two scenarios were considered. First, an information-complete referral may allow a timelier disposition to an appropriate treatment resource. Consider, for example, the case of a youth suffering primarily from substance use disorders. While these are certainly diagnosable psychiatric conditions (Schinnar et al., 1990), within the context of this study it may be the case that the youth could be referred directly to an appropriate resource rather than await an assessment by a psychiatrist who might, in fact, recommend such a resource. In this case an information-complete referral document would have facilitated a timelier triage to treatment; as

discussed above this would be a speculative but plausible benefit from an appropriate e-referral.

In addition it might be the case that an appropriate e-referral could lead to improved job satisfaction for the psychiatrists. As discussed by some of the respondents and elsewhere there is often a tension for the psychiatrists due to the often implicit wish on behalf of the referral source for the psychiatrist to assume care as part of the referral. (Creed et al., 1990) An appropriate e-referral with data elements that addressed expectations for the referral would, at least conceivably, help to manage this tension for the consultant psychiatrists.

Overall, it seemed to be the case that an appropriate e-referral to psychiatry would confer benefit in terms of efficiency of workflow at the least, and more speculatively for other aspects of the referral process.

5.2.6 Primary result: What is an appropriate e-referral to psychiatry?

Based on the overall, validated results of this study this main question for the project can be answered with confidence. An *appropriate referral* to psychiatry within the context of this study satisfied three conditions; namely-

1. The referral must provide evidence of a psychiatric problem;
2. The referral must ask a psychiatric question;
3. The referral must contain information that supports efficient workflow at the specific clinic; by including sufficient information to meet these conditions. An *appropriate e-referral* to psychiatry within the same context must deliver an

information-complete clinical document that is in accordance with the appropriateness and information requirements as outlined above.

The notion of context is key to understanding this conclusion. The need to acknowledge context is simultaneously a potential limitation to this study as well as result of this study; this is discussed further below.

5.2.7 Addressing the research questions: summary

After consideration of the research questions with respect to the findings of this study, some conclusions were formulated:

1. It was possible to generate a set of minimum criteria that operationalized the notion of appropriateness for an e-referral to psychiatry.
2. It was possible to develop a discrete reference set of minimum information requirements needed to satisfy the criteria for appropriateness.
3. A primary design requirement was the need to deliver an information-complete document.
4. Current standards did not seem well suited for an appropriate e-referral to psychiatry.
5. An appropriate e-referral would confer some benefits; at a minimum an appropriate e-referral would impart efficiency to the workflow around processing a referral.

It is acknowledged that these conclusions are valid only in the context of this study.

These conclusions and the notion of context will be discussed further in considering the results of this study within the scope of current knowledge about e-referrals.

5.3 Limitations to this study

Upon critical review there seemed to be three main limitations to this study. First, as discussed in detail below the development of e-referrals seemed highly dependent on context. While this was a key (if unanticipated) result of the project it also served to illustrate a main limitation of this project. In an ironic fashion one of the key results of this study—the sensitivity of the development of e-referrals to multiple contexts—also indicated that some of the results of this study cannot be generalized with any degree of confidence. Specifically, the information model for an appropriate e-referral to psychiatry was regarded as valid only in the context of this study with no apparent ability to generalize to contexts outside of this project. While it may be the case that with time some aspects of the information model may in fact have more generalized application, it is acknowledged that for now that the information model for an appropriate e-referral to psychiatry is not readily generalized for use in other contexts.

Second, the field study itself was conducted with a relatively small number of respondents drawn from a limited pool of organizations. While there was a remarkable degree of consensus among the respondents it is nonetheless acknowledged that a greater number of participants in the study conceivably could have resulted in less consensus and hence less valid results. Perhaps of greater concern, the limited pool of organizations may have skewed the results by virtue of providing only limited opportunity to assess the information needs and implied design requirements for e-referrals to psychiatry in a variety of contexts. This concern is partially mitigated by acknowledging that the results were valid only for a given context; if anything, this concern underscores the limitation to the generalizability of the results.

Third, it is acknowledged that the results of this study have a subjective nature inasmuch as they were developed according to the responses of one type of group, namely the end- users of requests for referrals. It is possible (if not likely) that the referral sources—typically primary care physicians—would have a different perspective about the information requirements for an e-referral to psychiatry. Conceivably, the difference in perspective might pivot about the perceived usability of the results. Whereas the respondents were clear that the information required was the minimum to be regarded as usable from their perspective, primary care physicians might in fact have concerns that the information requirements as outlined in this study are onerous when examined within the context of workflow at a busy primary care clinic. It is possible, then, that the information requirements might be modified after additional consultation with both referral sources and recipients.

Finally, it is acknowledged that the information model would not be sufficient to proceed to an actual design for an e-referral system for psychiatry without further consultation. Although out of scope for this study, further consultation with all stakeholders—referral sources (typically primary care physicians), psychiatrists and administrators (both for psychiatric offices as well as IT systems) -- would need to provide input about the best means of procuring and curating the required information. Conceivably, the information model developed in this project could be integrated into an existing electronic health record system in such a way that the required fields could be autopopulated or otherwise available to the consultant but as stated above this level of development is out of scope for this project and as such is acknowledged as a limitation.

5.4 Addressing gaps in the knowledge about e-referrals: using the results from this study

At the outset of this study several gaps in the current knowledge about e-referrals were identified (section 1.5). The results of this research project were used as a case study in order to address the gaps in the current knowledge of e-referrals both in terms of answering questions as the results of the study allowed as well as highlighting directions for further research in e-referrals.

5.4.1 How can the appropriateness of a referral (electronic or otherwise) be defined or assessed in an operationally useful way?

It was clear that within the context of this study this question could be answered. Indeed, a key result of this study was the determination of three criteria for determining the appropriateness of a referral to psychiatry. This was accomplished by consulting with the recipients of referrals- psychiatrists and administrators. As such, this study suggests that this question can be answered by stating: *“the appropriateness of a referral can be assessed by developing criteria derived by consulting with the end users of the referral.”* It was less clear whether the actual criteria developed in this study could be generalized in such a way that would also address this question in terms of content as well as process. While acknowledging that the results are valid within the narrow scope of this study—that is, valid for a given set of circumstances as described in the study—it is tempting to consider a more generalized set of criteria for assessing the appropriateness of any referral. In this respect, the criteria developed in this study could be adapted in a more generalized way as follows:

1. Any referral must demonstrate that the referred patient has a medical problem within the scope of the expertise of the consultant.
2. Any referral must ask a question or request a procedure that is within the scope of the expertise of the consultant to provide an opinion or intervention.
3. Any referral must support workflow for the consultant.

These generalized criteria could be tested by surveying stakeholders in different clinical disciplines for commentary and assessing for degree of consensus. In addition, the information requirements implied as a result of applying these criteria to referrals to various medical specialties could also be tested for consensus about required data elements in specific cases. Given that there is scope for additional research, this case study did at least demonstrate that criteria for judging the appropriateness of referrals can be operationalized and used to assess information requirements by consulting stakeholders.

5.4.2 What is known about the process for developing and implementing e-referrals?

The results of this study seemed to provide support for suggestions in the literature that an e-referral should be developed in consultation with stakeholders and should have the capacity for delivering sufficient clinical information. Beyond that observation this study also suggested that the development of an e-referral is specific, perhaps highly specific, to any given context and thus development of any e-referral would need to account first for the business cases of multiple stakeholders before deployment (please see the discussion in section 5.5). This study was not able to address the organizational impact of developing and implementing an e-referral.

5.4.3 How can e-referrals improve the quality of medical referrals?

This study suggested that one possible way of improving the quality of medical referrals was to implement an IT solution that enforced the delivery of information-complete referrals. This tentative conclusion paralleled the suggestion by Fischer (Fischer et al., 2010) that the quality of referrals was improved by enforcing the inclusion of appropriate clinical data, albeit by different means. At the same time, there were suggestions in the literature that e-referrals could improve the quality of referrals not by delivering an information-complete document but by including the capacity for some sort of dialogue between the referral source and consultant. (Chen et al., 2010; Kim-Hwang JE et al., 2011) It was not within the scope of this study to address which of these is the better option. Indeed, assessing for the best option overall might be a moot question insofar as the appropriate focus for investigation might instead be the context for developing the e-referral that in turn informs the specific IT solution; this is discussed further below.

5.4.4 How can e-referrals facilitate better outcomes for patients and organizations?

This study seemed to provide insight into one aspect of this question. Again, within the context of this study there was reason to believe that an appropriate e-referral—understood to be an information-complete clinical document—would impart efficiency at an organizational level in terms of facilitating a timelier disposition of the referral and, possibly, timelier care for the patient. This was evident from the results of the field study. In addition, the interview with the administrator also suggested that at

least in theory e-referrals could impart benefits at an organizational level in terms of tracking referrals in order to make decisions about deploying medical resources.

At the end of the study it was still not clear how e-referrals could improve clinical outcomes for patients. Presumably, better clinical outcomes would accrue both from quicker access to care as well as improved triage of patients to the right clinical resource. In turn, patients would need to wait less time for recommendations for treatment. This would certainly be a consideration for referrals around life-threatening conditions when time is “of the essence” such as treatment for cancer. Given that psychiatric conditions are usually not life-threatening then the benefit of quicker disposition of referrals and perhaps quicker access to care remained unclear.

5.4.5 What is the impact of particular technical deployments on the potential benefits of e-referrals?

This study suggested a surprising insight into addressing this question. Accounting for the results of the study overall, including the results of the literature review, field study and environmental scan, this seemed to be an invalid question. If anything the results of this study suggested that a particular technical deployment should be informed by the putative benefits of developing an e-referral and the question should be re-stated as: *what is the impact of the potential benefits of e-referrals on developing particular technical deployments (of e-referrals)?* Nonetheless it is likely the case that e-referrals have been developed within existing systems of care and in those cases the development of the e-referral was also likely not informed strictly by the potential benefits of an e-referral. In that sense this remained a valid question but it could not be addressed within the scope of this study and will not be discussed further.

This research project, as a case study, seemed to contribute to the overall knowledge about e-referrals. There was, however, a recurrent theme in terms of understanding the results of the study, namely the effect of context in understanding and interpreting the results. This is discussed in the next section.

5.5 Addressing the role of context in the research study

In the course of assessing the results of the study and integrating them into the current knowledge about e-referrals there was a recurrent theme, namely the need to account for context in interpreting the results and possibly applying the results in a more generalized way. This was an intriguing and unanticipated result of the research project. Ahead of any discussion about how accounting for context could affect the generalizability of the results of this study it is worthwhile to review briefly the how the need to acknowledge context was evident during the course of this project by discussing some instances in this study.

First, even while acknowledging that the results of this study were valid overall under a given set of circumstances the actual results of the field study—the information model for an appropriate e-referral to psychiatry—were context sensitive in their own right. Specifically, each respondent who represented a different clinic talked about the need for certain types of information unique to a given situation. This was manifested in the results as some data elements were deemed to be conditional. As a result the information model was conceptualized as a reference set of data elements that would be constrained or adapted depending upon a triggered need. As such there seemed to be

context sensitivity for the results at a granular level, namely the needs of the individual respondents.

In addition, the results of the field study (the information model as a reference set of data elements and the need for an information-complete clinical document) seemed sensitive to context when compared to results of the literature review and environmental scan. This context sensitivity seemed apparent in at least two ways.

First, there seemed to be the need to establish and acknowledge the *business cases* as a context for any e-referral under development. In the field study this was not addressed specifically, but it could be inferred reasonably that the respondents made a business case for e-referrals to contain sufficient clinical information in order to facilitate workflow. Put another way, the respondents seemed invested in receiving information-complete documents that would facilitate decisions in the workflow for the clinics. In this respect the business case for the field study seemed to center on the need to receive appropriate clinical information with what that implied for workflow.

In contrast, there were at least two examples of e-referrals developed under different business case contexts. First, the eHealth Ontario e-referral seemed to flow from business cases that emphasized needs such as facilitating existing referral patterns, leveraging extant electronic health record resources, tracking referrals, matching referred patients to available resources and ensuring that the standard would be “agnostic” to any specific vendor solution. (“eReferral Provincial Reference Model- eHealth Ontario,”). Apart from a basic form, information requirements were met by incorporating the capacity for messages as means of providing needed clinical information. The business cases for the eHealth Ontario standard did not seem to emphasize the clinical content of

the e-referrals as a primary concern. As a result it seemed to be a poor fit for the needs of e-referral to psychiatry as described in this study.

In addition the administrator for Manitoba eHealth confirmed explicitly that the business case for that system entailed primarily the need in that jurisdiction to track referrals and use the data to make decisions about deploying medical resources. That said the administrator did confirm that the Manitoba e-referral system incorporated some means of ensuring clinical appropriateness by incorporating “pathways” that acted in essence as clinical decision support to guide the referral source about the decision to submit the referral in the first place. In any event, as described the business case for the Manitoba system did not address primarily the need to include clinical information and this was confirmed by the administrator who was not aware of any published guides for information content in the e-referrals. The e-referral system was deployed on the basis of the business case as described above; perhaps tellingly it was suspended due to low rates of use.

The context sensitivity for the different business cases was evident when comparing the implied design requirements for e-referrals. As discussed above the design requirement of the eHealth Ontario system entailed the capacity for exchanging messages between referral source and the recipient of the referral. The Manitoba system entailed capacity to autopopulate forms and track referrals, with clinical content as a secondary consideration. In contrast, the results of the field study implied a design requirement for an IT implementation in that context to deliver an information-complete clinical document with no perceived need to facilitate additional communication. It is submitted, then, that e-referral development is highly sensitive to the business cases established up

front. Indeed, this would also seem to be a critical aspect in the development of e-referrals, namely the need to consult with and determine the multiple business cases—including the *clinical* business case—for the various stakeholders typically involved in deploying an e-referral system.

There also seemed to be context sensitivity, resulting in rather different types of actual or implied IT deployments, in terms of organizational considerations. This was evident when comparing the results of this study to the apparently successful deployment of an e-referral system at the San Francisco General Hospital (SFGH). ("SFGH e-referral") By way of review the published information about the SFGH indicated that specialists were hired to review referrals and, as needed, perform additional triage by clarifying the information in the referral or even the need for the referral. The work of the specialists in the SFGH was arguably similar to the work as described by the administrator respondents who spent a great deal of time soliciting additional information and clarifying the reason for the received referrals. Although the work seemed similar, certainly the attitude about the need for such work was decidedly different between the SFGH and respondent organizations. Whereas the SFGH hired specialists specifically for that type of work, the administrators interviewed for the field study indicated that they in essence performed the work of soliciting additional information almost by default and at an organizational level they did not wish to do such work in order to improve efficiency. The contrast could not be clearer: one organization embraced the need to solicit additional information whereas one organization wished to abandon the same need. The difference in the design requirements was also evident --the SFGH incorporated the capacity for messaging and in contrast again the results of the field study implied a different IT solution altogether. The

organizational differences between the respondents to the field study and the SFGH system were not explored in detail. It is nonetheless reasonable to assume that the different attitudes about the need to solicit additional information in processing referrals does in fact reflect as yet unknown organizational differences between the two subjects of the comparison. It is also submitted, then, that the development of e-referrals is also highly sensitive to organizational context.

Overall it seemed to be a result of this study that the development of e-referrals is highly dependent upon context at many levels of abstraction. The implication of this result will be discussed in the concluding remarks that follow.

5.6 Contributions of this study to the body of knowledge about e-referrals

After accounting for the concluding results and the limitations of this project, this study contributed to the body of knowledge about e-referrals in the following ways:

1. This project addressed one large gap in the knowledge about e-referrals as it seemed to be the first empirical study pertaining to the development of an appropriate e-referral to psychiatry. While the results of the field study did not seem to be readily generalizable to other contexts, nonetheless it was a pioneering study. If nothing else, as a pioneering effort this study offered value by presenting a validated information model for an appropriate e-referral to psychiatry that could be used as a basis of comparison in future studies.
2. This project also contributed to the knowledge about e-referrals by presenting a methodology for determining the appropriateness and resultant information requirements for referrals to specialists. Although conducted as a study for the

particular case of referrals to psychiatry, there was no reason to believe that the methodology as described in this study could not be used in the cases of other types of referrals. This is underscored by considering that the respondents in the study unequivocally validated the results of the study derived by the methodology as described in the report of this project.

3. Finally, this study contributed to the knowledge about e-referrals by using the results as a case study to address some of the identified gaps in that knowledge. Although not conclusive enough to be included as final results, using this project as a case study did allow for insight into the nature of some of the gaps in knowledge. In particular, this study was able to address meaningfully the gap in the knowledge of the process for developing e-referrals. Upon review of the literature, results of the field study, gap analysis and discussion of context sensitivity there was a convincing argument that e-referrals should be developed at a *conceptual level* before proceeding to technical deployment. In asserting this, it is understood that starting at a conceptual level would entail development at the most basic level of abstraction, namely a determination of the needs of the stakeholders (likely as reflected in multiple business cases) that in turn would inform the design requirements for information needs or capacity for communication in a subsequently deployed e-referral system.

5.7 Final remarks- next steps

While this study seemed to contribute to the body of knowledge about e-referrals, clearly there is much yet to be learned. If nothing else this study served to highlight the

need for ongoing research into e-referrals on many levels. In particular, this study identified a need to investigate the development of e-referrals at a conceptual level. Moreover, given the disparate types of e-referrals deployed there would seem to be a pressing need to investigate the effects of various types of context if there is any chance for arriving at generally applicable principles for the development of e-referrals. Finally, although this study hinted at putative benefits from e-referrals, clearly there is a need to research outcomes of e-referral deployments in order to guide future development of such systems.

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Appendix 1: Figures

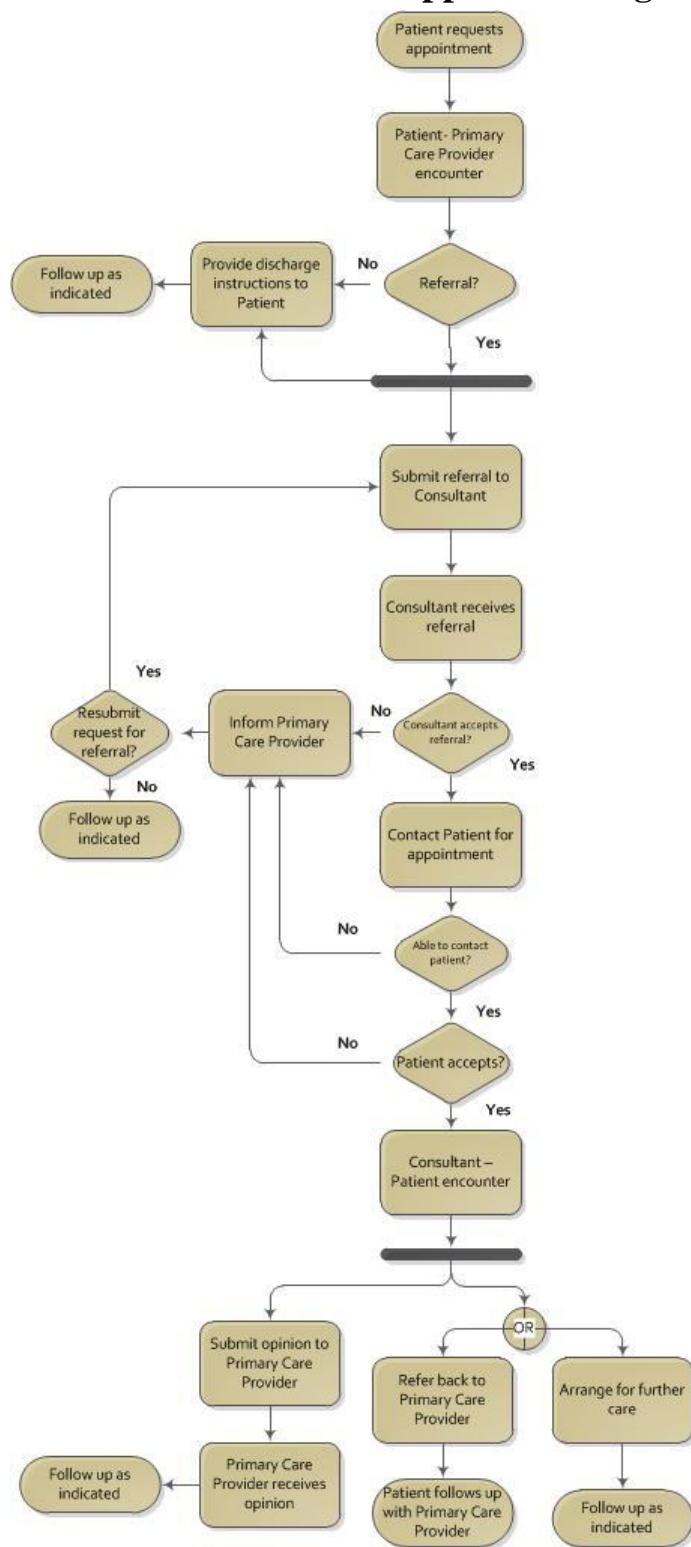
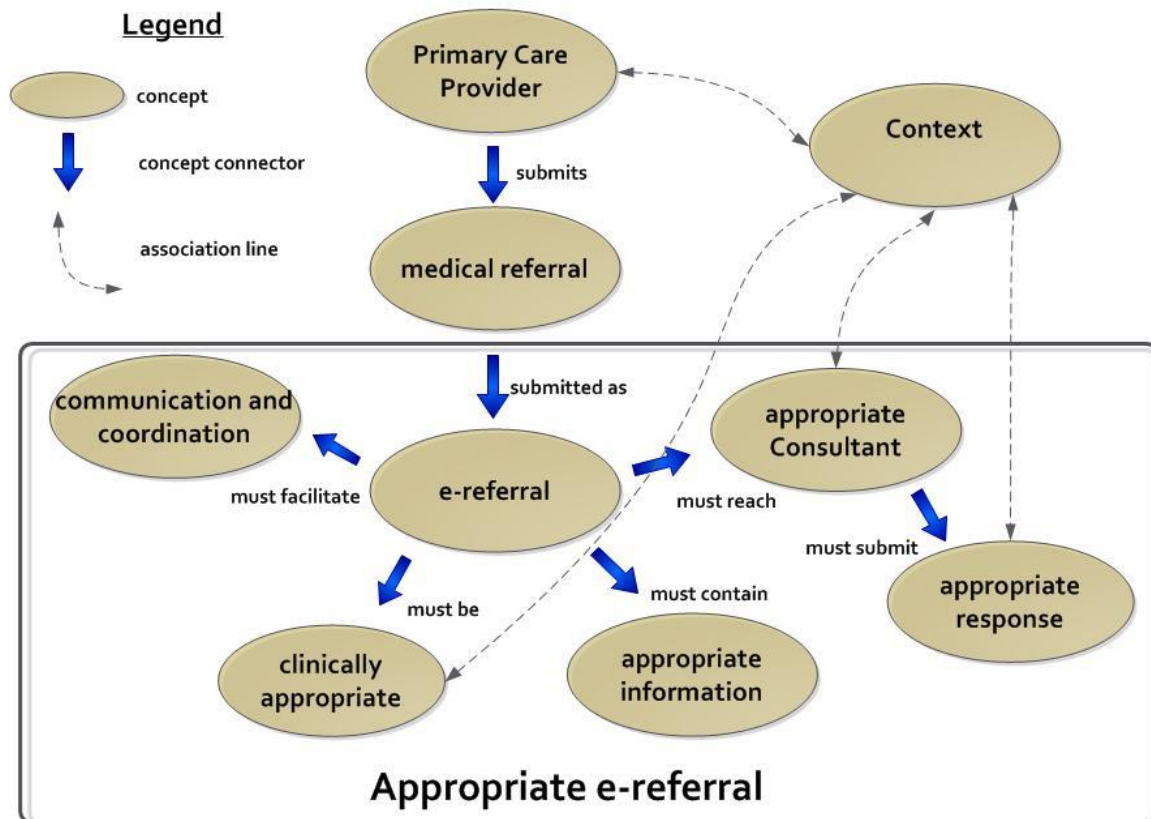


Figure 1: Activity diagram for the conventional medical referral process



Notes: The association lines indicate the concepts that might be particularly sensitive to context factors such as (but not limited to) physician remuneration models, physician experience, available resources, and expectations of the referral (advice, further care from the consultant).

Figure 2: Concept map for an ideal e-referral

Nodes

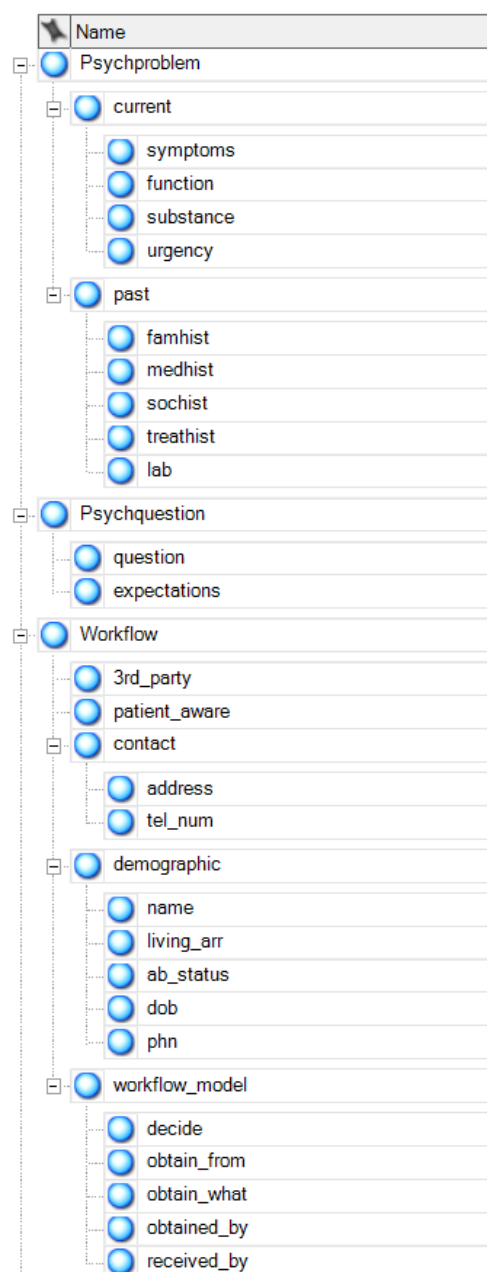


Figure 3: Screen capture-final coding hierarchy for information requirements for an appropriate e-referral to psychiatry

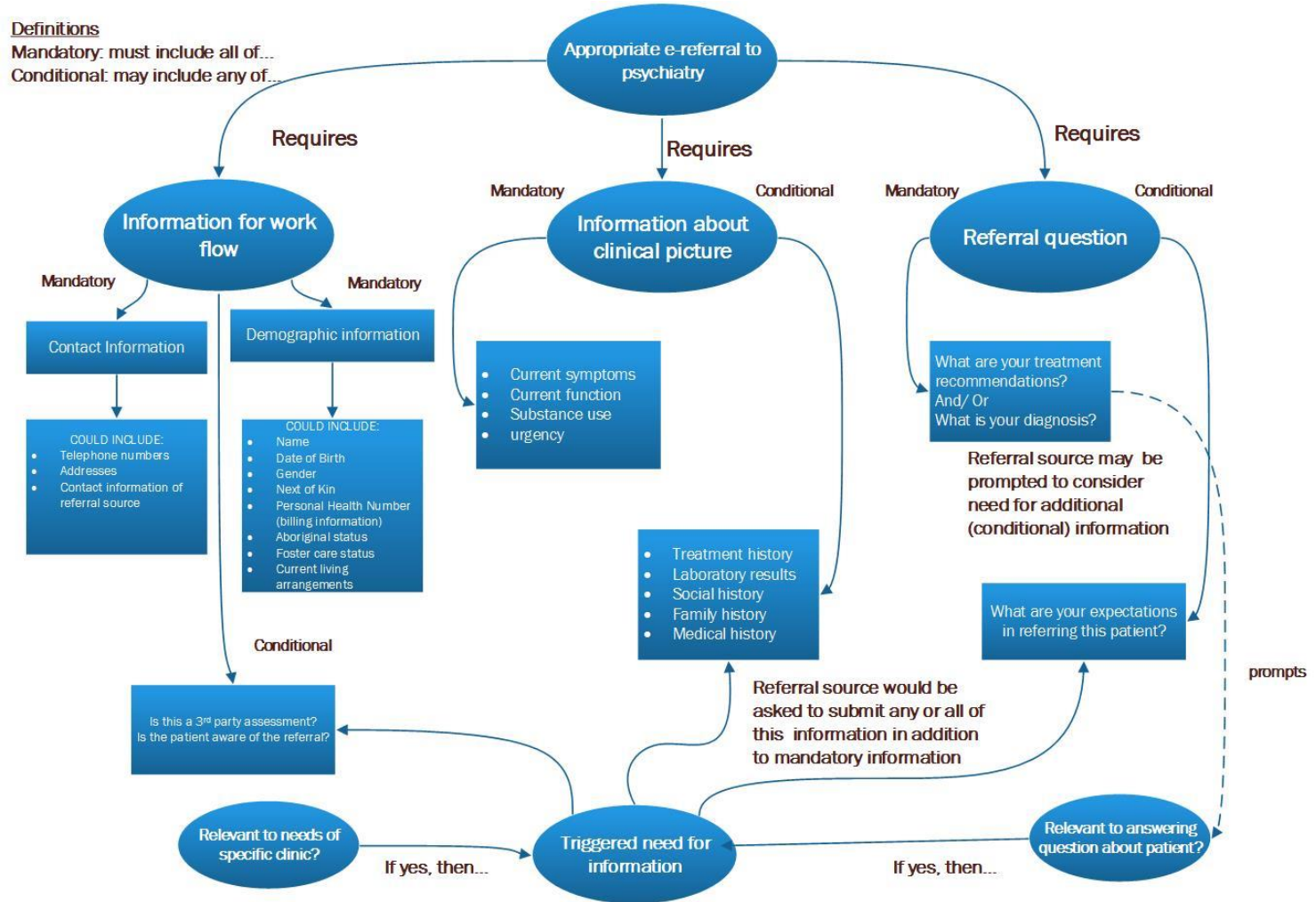


Figure 4: Concept model-information requirements for an appropriate e-referral to psychiatry

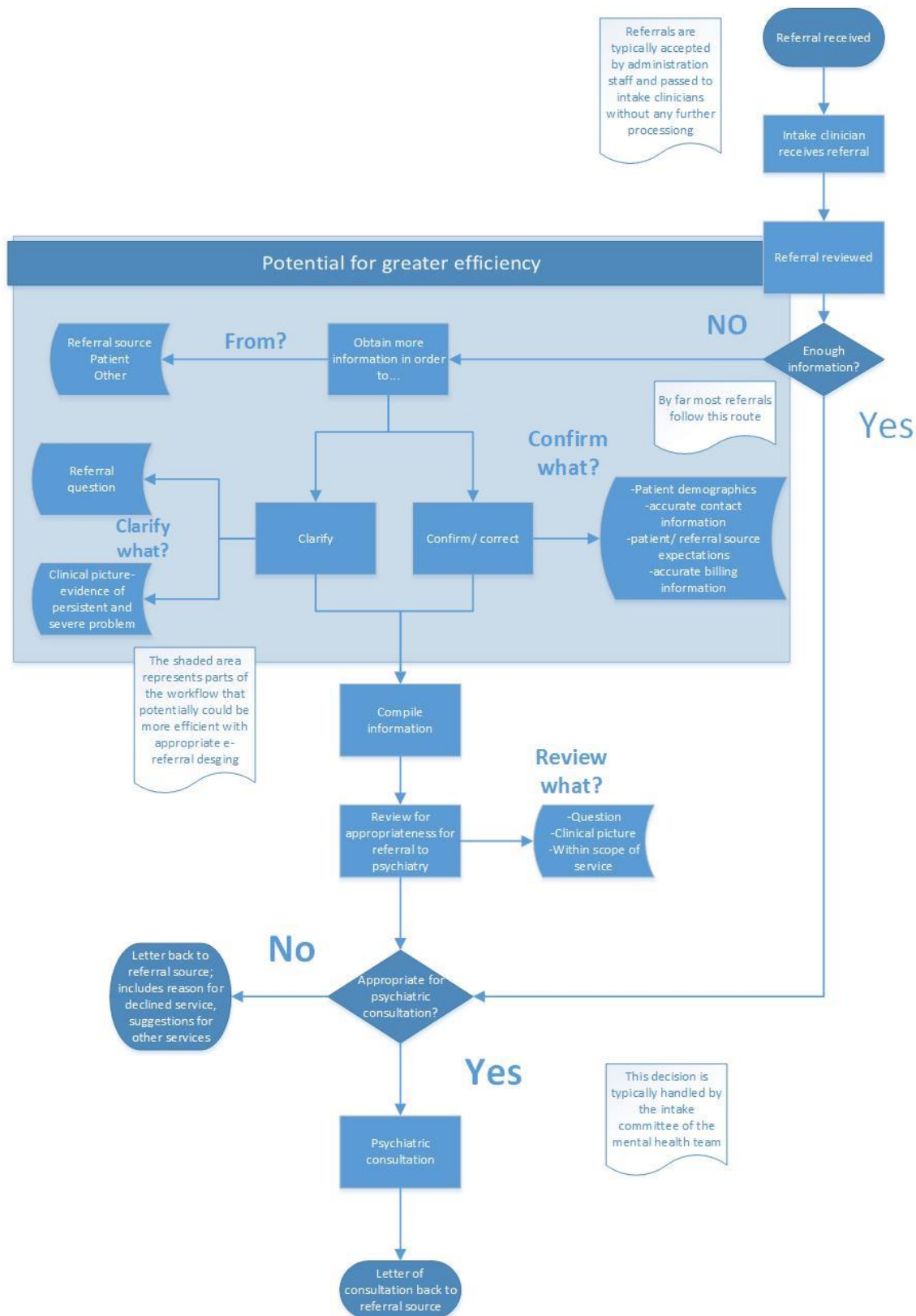


Figure 5 Model of typical workflow with conventional referrals

Appendix 2: Letters of Invitation

Dear Dr. _____;

I would like to invite you to participate in a research project called:
 “What is an appropriate e-referral for psychiatry?”

My name is Scott Prior, and I am currently a Master of Science candidate in the Department of Health Information Science at the University of Victoria. In the interest of full disclosure I will say that I am also a psychiatrist, but I am in a different role for this project-I am the primary researcher for a project that is looking at the use of information technology to submit referrals to psychiatrists.

By way of a brief overview, information technology is increasingly used in health care, especially in the form of electronic health records. As offices become “paperless” more and more communication will be handled electronically. One type of communication increasingly used is the electronic medical referral, or *e-referral*. Like all technology, e-referrals have the potential to improve many aspects of the referral process, yet there is little research on how e-referrals should be designed and deployed in order to ensure that they are appropriate for use. I would appreciate your help in determining the design considerations for an appropriate e-referral to psychiatry.

As a psychiatrist in active practice you have first-hand experience and knowledge around receiving and using referrals. As such, I would appreciate the opportunity to interview you about what you would like to see in e-referrals and how they can support your needs by ensuring they are appropriate on all levels. If possible, I would also appreciate the opportunity to see how referrals work in your practice, including a sample of typical referrals **(with no identifying information included)** and how they are handled in your practice. **Please note-submitting a sample of referrals is strictly optional, and I would still be pleased to hear your views whether or not you are able to provide a sample of referrals.**

This project is intended strictly to meet thesis requirements; there is no external funding or commercial interests involved in this project. I will share the results of my research freely upon request.

I would be pleased to discuss participation in my project in more detail. I can be contacted at:

Primary researcher: Scott Prior	email xxx@xxx	‘Phone xxx-xxx-xxxx
Supervisor: Dr. F. Lau	email xxx@xxx	‘Phone xxx-xxx-xxxx

Thank you for receiving this letter and considering my request-please feel free to contact me for any additional information or questions.

Dear Madam/ Sir;

I would like to request your help with a research project called:

“What is an appropriate e-referral for psychiatry?”

My name is Scott Prior, and I am currently a Master of Science candidate in the Department of Health Information Science at the University of Victoria. In the interest of full disclosure I will say that I am also a psychiatrist, but I am in a different role for this project-I am the primary researcher for a project that is looking at the use of information technology to submit referrals to psychiatrists.

By way of a brief overview, information technology is increasingly used in health care, especially in the form of electronic health records. As offices become “paperless” more and more communication will be handled electronically. One type of communication increasingly used is the electronic medical referral, or *e-referral*. Like all technology, e-referrals have the potential to improve many aspects of the referral process, yet there is little research on how e-referrals should be designed and deployed in order to ensure that they are appropriate for use. I would appreciate your help in determining the design considerations for an appropriate e-referral to psychiatry.

As someone who has first-hand experience in administering referrals I would appreciate the opportunity to speak with you about the work and process involved in handling a referral. This type of information would be used to design e-referrals so they are appropriate to your current and future needs. The interview would be brief--less than an hour--and would only include questions about the information and process you would like to see in order to make e-referrals appropriate for use.

This project is intended strictly to meet thesis requirements; there is no external funding or commercial interests involved in this project. I will share the results of my research freely upon request.

I would be pleased to discuss participation in my project in more detail. I can be contacted at:

Primary researcher: Scott Prior	email xxx@xxx	‘Phone xxx-xxx-xxxx
Supervisor: Dr. F. Lau	email xxx@xxx	‘Phone xxx-xxx-xxxx

Thank you for receiving this letter and considering my request--please feel free to contact me for any additional information or questions.

Appendix 3: Consent Forms

What is an appropriate e-referral for psychiatry?

You are invited to participate in a study entitled “**What is an appropriate e-referral for psychiatry?**” that is being conducted by Scott Prior.

Scott Prior is a Masters student in the department of Health Information Science at the University of Victoria and you may contact him if you have further questions by calling him at xxx-xxx-xxxx or by email at xxx@xxx

As a graduate student, I am required to conduct research as part of the requirements for a Master of Science (M.Sc.) degree. It is being conducted under the supervision of Dr. F. Lau. You may contact my supervisor at xxx-xxx-xxxx.

Purpose and Objectives

The purpose of this research project is to determine the best way to design and implement an electronic medical referral (e-referral) to psychiatry. As physicians move to using electronic medical records, referrals to specialists will be handled electronically. It is important to determine some basic needs, such as minimum information requirements and the workflow that needs to be supported, in order to ensure that e-referrals to psychiatry will be appropriate both clinically and appropriate for the process of the referral. Based on this research, a model for an e-referral to psychiatry will be developed and checked against the expectations of the participants in this research.

Importance of this Research

Research of this type is important because there is yet little information on the best way to develop and implement e-referrals, especially to psychiatry. Moreover, there are many problems with the conventional referral process; simply moving to a way of submitting conventional referrals by electronic format does not ensure that anything will be improved. This research will be used to develop evidence-base guidelines for best practices in e-referrals to psychiatry.

Participants Selection

Psychiatrists will be asked to help in this research.

You are being asked to participate in this study because you are able to contribute key knowledge that will help in the development of e-referrals. If you agree to participate your knowledge of the medical aspects of referrals will help to determine key information needs for e-referrals.

What is involved?

If you consent to voluntarily participate in this research, your participation will include a brief, in-person interview that will be at most 1 hour in length. You will be asked to comment on relevant aspects of referrals in your experience. You will also be invited to submit sample letters of referral in paper format that are stripped of any identifying information. In addition, you will be invited to look at and comment the information model for an e-referral that results from this research. You may choose to participate in any or only some aspects of this research. The researcher (Scott Prior) will take field notes, and there will be no other record made of the interview. Specifically, all information will be recorded on paper, and there will be no electronic recording of any kind made at any point in the research.

Inconvenience

Participation in this study may cause some inconvenience to you, including the need to adjust your schedule in order to accommodate an interview.

Risks

There are no known or anticipated risks to you by participating in this research.

Participants will be asked to participate in interviews in such a manner that the interview will not interfere with clinical duties or affect your income.

Benefits

The potential benefits of your participation in this research are primarily long-term outcomes and include more appropriate referrals to psychiatry and a more efficient referral process.

Voluntary Participation

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be handled by the following rule:

If you withdraw BEFORE data analysis, all records of the interview will be destroyed and your data WILL NOT be included in the data analysis.

If you withdraw AFTER data analysis, all records of the interview will be destroyed but your data WILL have been incorporated into the data analysis.

Regardless, data analysis will not identify any participants. If you withdraw at any time you will not be asked for any further information.

Researcher's Relationship with Participants

The researcher may have a relationship to potential participants as the researcher-Scott Prior-is a practicing psychiatrist. To help prevent this relationship from influencing your decision to participate, the following steps to prevent coercion have been taken:

The researcher will look for participants primarily among psychiatrists with whom he does not have a close working or personal relationship.

The researcher will NOT make repeated calls to potential participants.

On-going Consent

To make sure that you continue to consent to participate in this research, I will check with each participant about consent, and obtain verbal consent, before any subsequent interviews or contact for research purposes. All verbal consent will be recorded on a separate, stand-alone paper record.

Anonymity

In terms of protecting your anonymity the following procedures will be used:

No participants will be identified in the data analysis. The data analysis will look for themes and only report themes. Psychiatrists who submit sample letters will be instructed about making them fully anonymous.

Confidentiality

Your confidentiality and the confidentiality of the data will be protected by the following procedures:

All paper records will be kept in a locked cabinet in a secure office. The data will be entered into a computer secured by a password known only to the researcher.

Limits to Confidentiality

Given the relatively small community of psychiatrists it may happen that you become aware of others participating in this research, or that others (including non-participants) become aware that you are or have participated in this research. The following protocol will be used to mitigate or prevent any limits to confidentiality:

1. The interviews will be conducted under circumstances that you deem acceptable.
2. If you elect to submit sample letters of referral, then you will be instructed on how to make them anonymous and be given the means to submit them to the primary researcher under separate cover.
3. The interview will NOT ask for any views or opinions that could be regarded as sensitive, controversial or personal in nature; the interview will be restricted to professional opinion only.
4. The primary researcher will at all times act in an ethical manner and not divulge the names of any participants for any reason.

Dissemination of Results

It is anticipated that the results of this study will be shared with others in the following ways:

The thesis will be available on-line. It is anticipated that a scholarly paper will be written and submitted for publication.

Disposal of Data

Data from this study will be disposed of as following:

All paper records (notes of interviews and sample referral letters) will be shredded at the conclusion of research (when the thesis is submitted). The shredding will be done by the primary researcher, and documented appropriately (date, time, and place). It is not anticipated that any primary data will be used for future research.

There will be no electronic records of any primary data (interviews or samples of referral letters).

Contacts

Individuals that may be contacted regarding this study include

Dr. F. Lau (Supervisor), Health Information Science, University of Victoria, ph. xxx-xxx-xxxx

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study, that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

Name of Participant

Signature

Date

A copy of this consent will be left with you, and a copy will be taken by the researcher.

What is an appropriate e-referral for psychiatry?

You are invited to participate in a study entitled “**What is an appropriate e-referral for psychiatry?**” that is being conducted by Scott Prior.

Scott Prior is a Masters student in the department of Health Information Science at the University of Victoria and you may contact him if you have further questions by calling him at xxx-xxx-xxxx or by email at xxx@xxx

As a graduate student, I am required to conduct research as part of the requirements for a Master of Science (M.Sc.) degree. It is being conducted under the supervision of Dr. F. Lau. You may contact my supervisor at xxx-xxx-xxxx.

Purpose and Objectives

The purpose of this research project is to determine the best way to design and implement an electronic medical referral (e-referral) to psychiatry. As physicians move to using electronic medical records, referrals to specialists will be handled electronically. It is important to determine some basic needs, such as minimum information requirements and the workflow that needs to be supported, in order to ensure that e-referrals to psychiatry will be appropriate both clinically and appropriate for the process of the referral. Based on this research, a model for an e-referral to psychiatry will be developed and checked against the expectations of the participants in this research.

Importance of this Research

Research of this type is important because there is yet little information on the best way to develop and implement e-referrals, especially to psychiatry. Moreover, there are many problems with the conventional referral process; simply moving to a way of submitting conventional referrals by electronic format does not ensure that anything will be improved. This research will be used to develop evidence-base guidelines for best practices in e-referrals to psychiatry.

Participants Selection

Medical office administrators will be asked to help in this research.

You are being asked to participate in this study because you are able to contribute key knowledge that will help in the development of e-referrals. As an administrator your knowledge of the work involved will help to determine key functions of an e-referral.

What is involved?

If you consent to voluntarily participate in this research, your participation will include a brief, in-person interview that will be at most 1 hour in length. You will be asked to comment on relevant aspects of referrals in your experience. You may choose to participate in any or only some aspects of this research. The researcher (Scott Prior) will take field notes, and there will be no other record made of the interview. Specifically, all information will be recorded on paper, and there will be no electronic recording of any kind made at any point in the research.

Inconvenience

Participation in this study may cause some inconvenience to you, including the need to adjust your schedule in order to accommodate an interview.

Risks

There are no known or anticipated risks to you by participating in this research.

Participants will be asked to participate in interviews in such a manner that the interview will not interfere with clinical duties or affect your income.

Benefits

The potential benefits of your participation in this research are primarily long-term outcomes and include more appropriate referrals to psychiatry and a more efficient referral process.

Voluntary Participation

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be handled by the following rule:

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If you withdraw AFTER data analysis, all records of the interview will be destroyed but your data WILL have been incorporated into the data analysis.

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The researcher may have a relationship to potential participants as the researcher-Scott Prior-is a practicing psychiatrist. To help prevent this relationship from influencing your decision to participate, the following steps to prevent coercion have been taken:

The researcher will look for participants primarily among psychiatrists with whom he does not have a close working or personal relationship.

The researcher will NOT make repeated calls to potential participants.

On-going Consent

To make sure that you continue to consent to participate in this research, I will check with each participant about consent, and obtain verbal consent, before any subsequent interviews or contact for research purposes. All verbal consent will be recorded on a separate, stand-alone paper record.

Anonymity

In terms of protecting your anonymity the following procedures will be used:

No participants will be identified in the data analysis. The data analysis will look for themes and only report themes. Psychiatrists who submit sample letters will be instructed about making them fully anonymous.

Confidentiality

Your confidentiality and the confidentiality of the data will be protected by the following procedures:

All paper records will be kept in a locked cabinet in a secure office. The data will be entered into a computer secured by a password known only to the researcher.

Limits to Confidentiality

Given the relatively small community of people who work in the offices of psychiatrists it may happen that you become aware of others participating in this research, or that others (including non-participants) become aware that you are or have participated in this research. The following protocol will be used to mitigate or prevent any limits to confidentiality:

1. The interviews will be conducted under circumstances that you deem acceptable.
2. If you elect to submit sample letters of referral, then you will be instructed on how to make them anonymous and be given the means to submit them to the primary researcher under separate cover.
3. The interview will NOT ask for any views or opinions that could be regarded as sensitive, controversial or personal in nature; the interview will be restricted to professional opinion only.
4. The primary researcher will at all times act in an ethical manner and not divulge the names of any participants for any reason.

Dissemination of Results

It is anticipated that the results of this study will be shared with others in the following ways:

The thesis will be available on-line. It is anticipated that a scholarly paper will be written and submitted for publication.

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Data from this study will be disposed of as following:

All paper records (notes of interviews) will be shredded at the conclusion of research (when the thesis is submitted). The shredding will be done by the primary researcher, and documented appropriately (date, time, and place). It is not anticipated that any primary data will be used for future research.

Contacts

Individuals that may be contacted regarding this study include

Dr. F. Lau (Supervisor), Health Information Science, University of Victoria, ph. xxx-xxx-xxxx

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study, that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

Name of Participant

Signature

Date

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Appendix 4: Interview questions-psychiatry

Thank you for agreeing to participate in this research. I would like to ask some questions about your experience with receiving referrals for your service. These questions deal with your opinion about the quality of the information in referrals, what you need from a referral, and how you or your office handles a referral. You are not obligated to answer any questions, but your opinion is appreciated.

Do you receive referrals for appointments with you?

If so, who refers to you?

Do you receive referrals from physicians? If so, what kinds of physicians?

Do you make any decisions about offering an appointment when you receive and review a referral?

If so, what kinds of decisions?

What would lead you to accept a referral?

If so, do you make any decisions about urgency/ priority?

What would lead you to decline a referral?

If not, do you accept all referrals?

What kind of information do you usually see in a referral?

Demographic?

Reason for referral?

Treatment history?

Past and current medications?

Family history?

Current medical problems?

Expectations communicated in the referral?

Consultation only?

Treatment and follow-up?

What kind of information would you like to see in a referral?

Demographic?

Reason for referral?

Treatment history?

Past and current medications?

Family history?

Current medical problems?

Expectations communicated in the referral?

Consultation only?

Treatment and follow-up?

What information is critical for you to make a decision about accepting or declining a referral?

What information is critical for making a decision about urgency/ priority?

Do you ever attempt to obtain more information before accepting/ declining a referral or seeing a patient referred to you?

If so, how do you obtain more information?

In the event that you decline a referral, how is that decision communicated to the referral source?

What information about a declined referral do you send back to the referral source?

Do you ever re-direct referrals?

In the event that you accept a referral, what happens next?

How is the patient contacted?

Do you notify the referral source that you have accepted the referral?

If not, are there barriers to doing so?

A few questions about the nature of your practice as it applies to referrals...

What kinds of patients are you willing to see?

Age constraints?

What kinds of problems are you willing to consult on?

Are there requests for consult or treatment that you would re-direct?

If so, what are your criteria?

Are there types of problems you would like to see but do not usually receive referrals for?

How do you make referral sources aware of your practice profile?

A few questions about your information processing...

How do you receive referrals?

Letter?

Email?

Telephone?

Other media?

Do you use any form of electronic medical record?

If so do you receive referrals electronically?

If so do you notice any difference between electronic and other referrals?

Please elaborate.

Thank you for speaking with me. Please take a moment and review what I have recorded.

Do you have any other comments or observations that you feel would help me to understand your information and workflow needs with referrals?

Appendix 5: Interview questions-administrators

Thank you for agreeing to speak with me. I understand that part of your work involves acting on referrals for consultation. I would like to ask a few questions about the work involved in acting on a referral.

Please describe the general process of acting on a referral...

What happens when a referral comes to the office/ clinic?

Do you receive and pass on the request for referral?

If not, who receives the referral?

What happens when you are asked to act on a referral?

Who asks you to act on the referral?

How do you contact the patient?

What information in the referral is critical in contacting the patient?

Do you ever contact the referral source?

If so, what information do you send?

How do you make an appointment?

Do you prepare a chart?

What information in the referral is critical in this respect?

Do you contact the patient to remind about appointments?

What happens when a patient presents for an appointment?

What happens if a patient...

Declines an appointment?

Fails to show?

What referral information do you routinely access or need?

What happens if a referral has insufficient/ incorrect information?

Overall what is the most important information in a referral that you require to be able to process it?

Appendix 6: Coding memos- definitions

The final codes used to classify the data from the field study are explained in this section. The codes and explanations are presented in the hierarchy used for the final data analysis (please refer to Figure 4).

Please note: the phrase “any data” is understood to mean that the respondents requested the inclusion of the data element in an e-referral to psychiatry.

Please note: unless indicated otherwise, all codes represent requests for data about the patient referred for psychiatric consultation

<u>Code name</u>	<u>Position in hierarchy</u>	<u>Notes</u>
Psychproblem <i>“psychiatric problem”</i>	Main code	Subsumes any data pertaining to a description of the psychiatric concern
current	Sub- code	Subsumes any data pertaining to a description of current psychiatric concerns
symptoms	Sub- sub- code	Used to code any data pertaining to current psychiatric symptoms
function	Sub- sub- code	Used to code any data pertaining to current problems with day to day function
substance	Sub- sub- code	Used to code any data pertaining to current concerns about drug and alcohol use
urgency	Sub- sub- code	Used to code any data pertaining to a need to indicate that the referral is of a high priority
past	Sub- code	Subsumes any data pertaining to past psychiatric concerns
famhist <i>“family history”</i>	Sub- sub- code	Used to code any data pertaining to psychiatric concerns within the family tree
medhist <i>“medical history”</i>	Sub- sub- code	Used to code any data pertaining to medical concerns

treathist <i>"treatment history"</i>	Sub- sub- code	Used to code any data pertaining to past psychiatric treatments
lab <i>"laboratory values"</i>	Sub- sub- code	Used to code any data pertaining to relevant laboratory results as judged by the referral source
Psychquestion <i>"psychiatric question"</i>	Main code	Subsumes any data pertaining to the reason(s) for the referral
question	Sub- code	Subsumes any data pertaining to the question driving the referral, e.g. 'what is the diagnosis?' or "what is the best treatment?"
expectations	Sub- code	Subsumes any data pertaining to the expectations for the outcome of the referral on behalf of the referral source, e.g. that the consultant will assume care
Workflow	Main code	Subsumes any information provided by the respondents about the information typically requested to support workflow around processing referrals
3rd party <i>"third party"</i>	Sub- code	Used to code any data pertaining to information that the request for referral is made for third party purposes, e.g. for disability assessment
patient_aware <i>"Is the patient aware of the referral?"</i>	Sub- code	Used to code any data pertaining to information that the referred patient is aware that the referral has been submitted
contact <i>"contact information"</i>	Sub- code	Used to code any data pertaining to contact information for the referred patient
address	Sub- sub- code	Used to code any data pertaining to the referred patient's address

tel_num <i>"telephone number"</i>	Sub- sub- code	Used to code any data pertaining to the referred patient's telephone number(s)
demographic	Sub- code	Subsumes any data pertaining to a demographic description of the referred patient
name	Sub- sub- code	Used to code any data pertaining to the referred patient's name(s)
living_arr <i>"living arrangements"</i>	Sub- sub- code	Used to code any data pertaining to the living arrangements of the referred patient, e.g. lives with foster parents
ab_status <i>"aboriginal status"</i>	Sub- sub- code	Used to code any data pertaining to the fact that the referred patient is of first nations ancestry and/ or has status as aboriginal citizen
dob <i>"date of birth"</i>	Sub- sub- code	Used to code any data pertaining to the referred patient's date of birth
phn <i>"personal health number"</i>	Sub- sub- code	Used to code any data pertaining to the patient's medical plan number used for physician billing
workflow_model	Main code	Subsumes any data pertaining to the information provided by the respondents about the workflow around processing conventional (i.e. not electronic) referrals
decide	Sub- code	Used to code any data pertaining to information provided by the respondents about when decisions are made about received referrals
obtain_from	Sub- code	Used to code any data pertaining to information provided by the respondents about who is typically solicited to obtain information needed to process the referral

obtain_what	Sub- code	Used to code any data pertaining to information provided by the respondents about what kind of information is typically solicited in order to process the referral
obtained_by	Sub- code	Used to code any data pertaining to information provided by the respondents about who typically solicits the information needed to process the referral
received_by	Sub- code	Used to code any data pertaining to information provided by the respondents about who typically receives the initial (not yet processed) referral
