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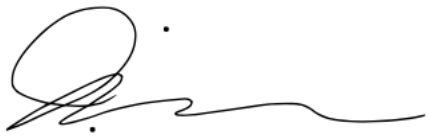
Signature:  Date: 1/13/2020

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PRE-CONSULTATION COMMUNICATION BETWEEN PRIMARY AND SPECIALTY CARE PROVIDERS

By

Jordan Connelly

A scholarly project

submitted in partial fulfillment

of the requirements for the degree of

Doctor of Nursing Practice in the Department of Health Sciences

Colorado Mesa University

Grand Junction, Colorado

Spring, 2020

COMMITTEE APPROVAL

PRE-CONSULTATION COMMUNICATION BETWEEN PRIMARY AND SPECIALTY CARE PROVIDERS

Jordan Connelly

The final copy of this thesis/dissertation has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the Department of Nursing. It has, therefore, been approved as meeting the requirements for the Degree of Doctorate of Nursing Practice.

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ABSTRACT

PRE-CONSULTATION COMMUNICATION BETWEEN PRIMARY AND SPECIALTY CARE PROVIDERS

The U.S. health care system is inundated with inefficiencies, which can often be attributed to poor communication between providers. Specifically, absent or insufficient pre-consultation communication leads to poor patient outcomes. This manuscript addresses communication inadequacies between primary and specialty care providers by introducing a system-wide communication platform strategy in a large urban safety-net hospital system. Theoretical frameworks used to organize and guide the project are the Donabedian model, and Imogene King's Theory of Goal Attainment. Plan-Do-Study-Act cycles are used to identify system needs and objectives, and to create a standardized policy that guides providers on the purpose and use of pre-consultation communication. The policy introduction is disseminated throughout the system to foster knowledge sharing. Stakeholder goal attainment is calculated to measure success.

Keywords: pre-consultation communication, Donabedian model, Theory of Goal Attainment, Plan-Do-Study-Act

CLEARANCE LETTER FROM IRB

TO: Jordan Connelly

FROM: Cheryl K. Green, PhD
Director of Sponsored Programs

SUBJECT: IRB Determination of Human Subject Research

DATE: October 30, 2019

STUDY: Protocol 20-10: Pre-Consultation Platform Implementation QI Project

The Colorado Mesa University Institutional Review Board (IRB) also known as the Human Subjects Committee has reviewed your request for determination of human subject research and based on your answers, your project is deemed to not be research involving human subjects as defined by 45 CFR 46.102(e).

No further IRB review is necessary unless modifications to your project meets the definition of research involving human subjects as defined by federal regulations. Should you wish to conduct this type of research on this project in the future, then please submit an applicable IRB protocol application (i.e., Exempt, Expedited/Full) for IRB review and approval.

IRB Number: 20-10. This number is your protocol number and should be used on all correspondence with the IRB regarding this study.

Determination Date: October 30, 2019

If you have any questions, please feel free to contact me at irb@coloradomesa.edu. Best wishes on your project.

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SECTION 1

PROBLEM STATEMENT AND PURPOSE

The healthcare system is complex and ripe with inefficiencies that lead to negative consequences for patients and providers (Bell et al., 2012; Bentley et al., 2008; Lin, 2012; Murray, 2002; Zuchowski et al., 2015). One underlying cause of inefficiency is inadequate or absent communication between primary and specialty care providers surrounding referral decision-making (Bentley et al., 2008; Lin, 2012; Murray, 2002). The purpose of this project is to address communication inadequacies between primary care and specialty providers by introducing system-wide pre-consultation communication options. Pre-consultation is communication that occurs between primary and specialty care providers prior to the official referral request.

Background

The inefficiencies of the United States (U.S.) healthcare system are well documented (Garber & Skinner, 2008; World Health Organization [WHO], n.d.). The U.S. spends more on healthcare than all other developed countries, and life expectancy is not congruent with spending (Garber & Skinner, 2008; Organization for Economic Cooperation & Development [OCED], 2019). In the U.S., care is often fragmented, costly, wasteful, and sometimes void of efficacy and value (Garber & Skinner, 2008).

Over half of U.S. healthcare expenditures accrued are due to waste (PricewaterhouseCoopers Health Research Institute, 2008). The Institute of Medicine recognizes these inefficiencies and calls for patient-centered, timely, and efficient care (Agency for Healthcare Research & Quality [AHRQ], 2015).

One underlying cause of health care inefficiencies is poor communication between health care providers (Bell et al., 2012; Lin, 2012). Poor communication between primary and specialty care leads to poor outcomes for patients, as shown in Table 1.1 (Lin, 2012). Specifically, pre-consultation communication between primary and specialty care is inadequate (Forrest et al., 2000; Zuchowski et al., 2015). Patient referrals are a common and important component of quality health care (AHRQ, 2017). Nationally, physician referrals to other physicians have increased by 92% over a 10-year timespan (1999 to 2009) (Barnett et al., 2012). The increasing frequency of referrals in the presence of poor pre-consultation communication creates an environment for a harmful impact on patient care at the national level (Foy et al., 2010).

Table 1.1
Description of Outcomes of U.S. Healthcare Inefficiencies Due to Poor Provider Communication

Inefficiency	References
Reduced access to timely care & treatment, long specialist wait times	Gandhi et al., 2000; Murray, 2002; Zuchowski et al., 2015
Rejected referrals	Lin, 2012; Zuchowski et al., 2015
Increased costs	Lin, 2012
Increased fragmentation of care	Chew-Graham et al., 2008; Lin, 2012

Increased duplication in testing & treatment	Gandhi et al., 2000; Murray, 2002
Increased hospitalizations	Lin, 2012
Increased risk of malpractice suits	Gandhi et al., 2000
Primary & specialty provider frustration	Lin, 2012; Mehrotra et al., 2011; Murray, 2002; Zuchowski et al., 2015
Patient frustration with siloed care	Murray, 2002; Zuchowski et al., 2015
Poor patient outcomes	Bell et al., 2012; Gandhi et al., 2000; Murray, 2002; Zuchowski et al., 2015

Two common themes surrounding the effects of poor provider communication found within the literature are reduced access to care and increased waste and cost, both of which lead to poor patient and provider outcomes (Bell et al., 2012; Gandhi et al., 2000; Murray, 2002; Zuchowski et al., 2015). Poor primary care-specialty provider communication leads to reduced access to timely care and treatment as a result of referral rejections, delays in care, and long wait times (Gandhi et al., 2000). Bell and colleagues (2012) found that 8.5% of referrals were prematurely initiated and 3% were unnecessary. Forrest and colleagues (2006) found a 17% referral rejection rate in their study of 83 practices across 30 states.

Lack of formal communication pathways between providers leads to longer wait times, rejected referrals, and delayed treatment (Lin, 2012; Murray, 2002). Communication pathways in the referral process improve access to care and reduce delays in care (Keating et al., 1998). Between 2016 and 2018, the Joint Commission

reviewed 2,429 sentinel events, and noted that over 8% of those events were due to delays in treatment (Joint Commission, 2019). There were 6.2% more sentinel events from 2016 to 2018 than from 2013 to 2015 (Joint Commission, 2019). Delays in care were in the top five types of sentinel events, although rates were slightly improved in 2018 compared with 2017 (Joint Commission, 2019).

Healthcare inefficiencies lead to waste and drive up costs (Bentley et al., 2008). In 2017, the U.S. spent $3.5 trillion on health care, 20% of which was related to physician services (Center for Medicare & Medicaid Services, 2018). Over half of US health care expenditures are accrued due to waste (PricewaterhouseCoopers' Health Research Institute, 2008). Poor primary-specialty provider communication leads to increased fragmentation of care, increased hospitalizations, and increased unnecessary duplication of testing and treatment (Lin, 2012). The Cleveland Clinic implemented a communication tool into their electronic health record (EHR), aiming to reduce the heavy burden of healthcare costs, adverse effects of avoidable phlebotomy, and patient frustration (Procop et al., 2014). They found it prevented around 12,000 potentially wasteful and harmful duplicate tests, and $183,586 in savings over two years (Procop et al., 2014). Healthcare inefficiencies manifested as inappropriate referrals produce waste, lead to provider frustration, and decrease access to care (Zuchowski et al., 2015). Provider frustration was associated with terminating practice, and therefore further added to the problem of reduced access to care (Rabatin et al., 2016).

Problem Statement and Gap in Clinical Practice

The healthcare system is ripe with inefficiencies due to communication deficits (Bell et al., 2012; Bentley et al., 2008; Lin, 2012; Murray, 2002; Zuchowski et al., 2015).

Communication deficits between primary and specialty care lead to waste, poor patient outcomes, and frustration (Bentley et al., 2008; Lin, 2012; Murray, 2002; Zuchowski et al., 2015). Key stakeholders for this project identified healthcare inefficiencies at their urban safety net hospital (B. Neuhalfen & T. Freudig, personal communication, March 11, 2019).

Pre-consultation communication options in some hospital systems are insufficient or absent (Forrest et al., 2000; Lin, 2012; O'Malley & Reschovsky, 2011; Stille et al., 2006). There is no formal pre-consultation pathway for providers at the urban safety net hospital where this project will be conducted. Improved communication between primary and specialty care has been shown to improve patient care and provider satisfaction, thus highlighting a gap in clinical practice in some health care systems (Forrest et al., 2000; O'Malley & Reschovsky, 2011; Stille et al., 2006). The proposed intervention is to introduce pre-consultation options into an urban health care system. This project has the potential to improve care and satisfaction for referred patients and improve provider satisfaction within this system (Forrest et al., 2000; O'Malley & Reschovsky, 2011; Stille et al., 2006).

Study Purpose

The purpose of this project is to address communication inadequacies between primary care and specialty providers by introducing system-wide pre-consultation communication options. Providers will be notified and trained on how and when to utilize the pre-consultation option. Changes, if any, in the referral pre-consultation utilization and referral rejections rates will be monitored. The project will be completed by a DNP student attending Colorado Mesa University (CMU), working closely with health system stakeholders and CMU faculty. The project is intended to

be replicable and transferable for the individual or group trying to create system-level quality improvement changes. Advanced practice registered nurses (APRNs) have an opportunity to impact communication at the system-level in order to impact health care systems and patient care (AHRQ, 2017). Table 1.2 defines terms used to describe the problem statement, clinical gap, and project's purpose.

Table 1.2
Definition of Terms

Term	Definition
Communication	Interaction between a sender & receiver intended to transfer information (Miller, 1966).
Communication Platform	A standardized formal avenue for communication (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).
Electronic Consultation	Formal professional dialogue or advice that occurs between providers solely electronically versus in person (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).
Electronic Health Record (EHR)	A database that contains patient medical records accessible by authorized individuals involved in patient care; has the benefit of embedding clinical decision-making tools (Office of the National Coordinator for Health Information Technology, 2017).
Electronic Referral	A referral request initiated through the EHR in anticipation of an in-person consultation (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).
Embed	To make part of something else (Merriam-Webster, n.d.a).
Inappropriate Referrals	Referrals that should not have been initiated (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019; Bell et al., 2012; Forrest et al., 2006).
Introduce	To formally announce & bring forth (Merriam-Webster, n.d.b).
Pre-consultation	Communication that occurs between primary & specialty care providers prior to the official referral request (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).

Pre-consultation Exchange	Communication between primary care & specialist provider prior to or in lieu of a specialist referral visit (Sewell et al., 2013).
Pre-consultation Platform	The standardized formal avenue for pre-consult communication (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).
Primary Provider	A provider that manages the overall health of an individual over time as a point of entry into the health system (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).
Referral Rejection Rate	The number of referrals that are rejected over a period of time (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).
Specialist Provider	A provider that has extensive knowledge & practice within a medical specialty (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).
System-wide	Throughout an established group or network working as a whole (Merriam Webster, n.d.c)

SECTION 2

SYSTEMATIC INTEGRATED LITERATURE REVIEW

Poor communication between providers causes health care inefficiencies and leads to negative patient outcomes and provider frustration (Bentley, Effros, Palar and Keeler, 2008; Lin, 2012; Murray, 2002). Communication breakdown is often present in the patient referral process (Bentley, Effros, Palar and Keeler, 2008; Lin, 2012; Murray, 2002). Improving the ability to pre-consult prior to referral requests improves communication and patient-centered care (Foy et al., 2010; Greenberg, Barnett, Spinks, Dudley and Frolkis, 2014; Sewell, Guy, Kwon, Chen and Yee Jr., 2013). A systematic integrated literature review was conducted in order to uncover solutions to system inefficiencies related to poor pre-consultation communication.

The Cumulative Index for Nursing Allied Health Literature (CINAHL) and MEDLINE were searched to identify articles related to solving pre-consultation communication problems. Search terms and characters included: (pre-consult AND (referral communication AND (introduce OR implement)) OR (preconsult* exchange) OR (referring physician AND (communicat* AND) (consult*)) OR (medical neighborhood AND (referral)) OR (doctor to doctor communication AND refer* AND

(primary secondary)) OR (Referral network AND provider to provider communication AND (question*)) OR pre-consult* OR preconsult*.

Inclusion criteria were articles from academic journals that (1) were published between 1968 and 2019, (2) discussed the method or introduction of a provider-to-provider communication platform, (3) were available in English, and (4) were peer reviewed. Exclusion criteria were articles that (1) focused on communication other than provider-to-provider communication, (2) were not available in English, (3) were not peer reviewed, (4) were meta-analyses, (5) focused on electronic consultation or post-consultation communication, or (6) did not discuss the method or introduction of a provider-to-provider communication platform. The publication initiation date was chosen in relation to when EHRs first emerged in the U.S. health care setting (Evans, 2016).

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines informed the article retrieval process. The article retrieval process is depicted in Figure 2.1. The initial search yielded 341 articles. Thirty-seven articles were excluded because they were written in languages other than English. Fifty-one articles were eliminated because they were duplicates. The abstracts of 253 articles were reviewed. Two hundred thirty articles were excluded for reasons identified in Table 2.2.

Table 2.2.

Exclusion of Articles Following Abstract Reviews (N=290)

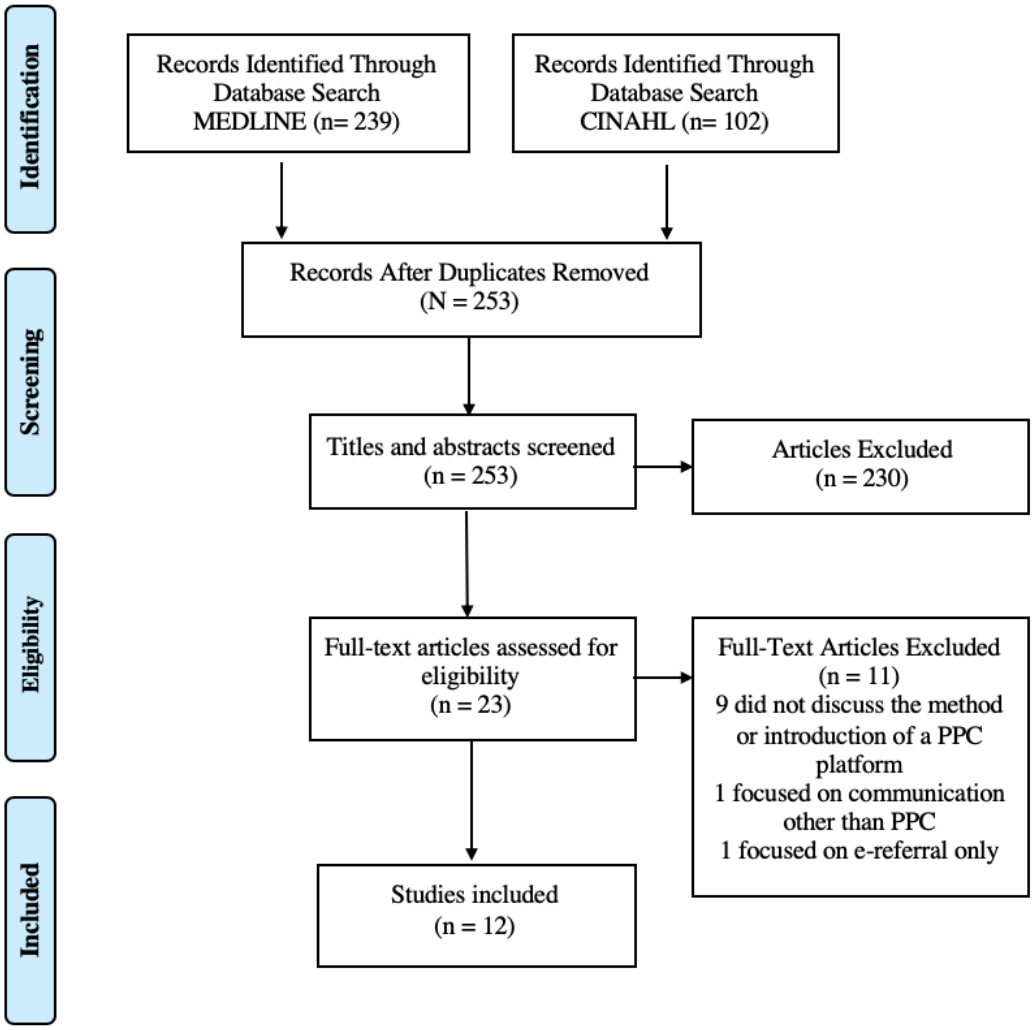
n of Articles Excluded	Reasons for Exclusion
93	Focused on pre and post-consultation intervention outcomes unrelated to a communication platform.

41	Focused on provider-patient communication rather than provider-to-provider communication.
9	Discussed e-consultation without pre-consultation.
7	Discussed the problem of poor pre-consultation communication, but not the communication or implementation method.
4	Discussed communication after formal referrals were made rather than before.
76	Focused on topics unrelated to pre-consultation communication.

Note. n = number.

The full text of 23 articles were read in full. Eight articles were excluded because they did not discuss the method or introduction of a provider-to-provider communication platform. One article was excluded because it focused on provider-patient communication rather than provider-provider communication. One article was excluded because it only focused on electronic referral. Twelve articles were included in the final analysis. Figure 2.1 depicts the attrition diagram.

Figure 2.1
Summary of Article Selection Process



Note. The attrition diagram by the PRISMA model. PPC= provider-to-provider communication; Adapted from Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analysis: The PRISMA statement. *Peer-Reviewed Weekly Medical Journal, 6*(7). doi: 10.1371/journal.pmed1000097

Table 2.3 details the purpose, design, and findings from each of the 13 articles included in the analysis. The systematic integrated literature review revealed three themes, (1) the frequency of pre-consultation communication (FPC) (n=4), (2) the pre-consultation communication method (n=6), (3) the outcomes of pre-consultation (n=8). Some articles addressed more than one theme while others addressed only one theme.

Table 2.3
Summary of Articles

Authors	Purpose	Design	N	Findings	Themes
McPhee, Lo, Saika, & Meltzer (1984)	To evaluate communication method & referral outcomes.	Prospective cohort study	N=449 patient referrals, N=27 referring providers	Direct provider-to-provider communication occurred 9% (n=39/430) of the time. 80% (n=24/30) of referring providers received consultation results following direct contact with specialists prior to referring versus 54% (n=145/271) who did not directly contact the specialist.	FPC, OPC

Sewell, Telischak, Day, Kirschner & Weissman (2014)	To understand provider perspective of pre-consultation exchange.	Prospective Cross-sectional survey	N=451 provider responses; 69.4% primary care physicians & 30.6% specialty physicians	28% (n=127) frequently used pre-consultation exchange, & 40% (n=178) were occasional users.	FPC
Won and Rosenkrantz (2017)	To assess informal communication between referring	Retrospective cohort study	N=300 patient charts N=1,345 notes	Clinical interpretations were unchanged 66.1% (n=111) of the time. Clinical interpretations changed 4.2% (n=7) of the time, led to an acuity	OPC

	providers & radiologists.			upgrade 5.4% (n=9) of the time, acuity downgrade 8.3% (n=14) of the time, & a change in management 16.1% (n=27) of the time. Only 8.9% (n=15) of radiologists documented addenda after informal communication including those necessitating a change in patient management.	
Klobuka, Lee, Buranosky & Heller (2019)	To explore communication preferences	Descriptive: Cross-	N=95 Diagnostic Radiology	Residents felt that increased access to a radiologist would make it	OPC, PCM

between referring providers & radiologists.	Sectional Survey	(N=24) and IM residents (N=72)	easier to ask questions (99%, n=71/72), 79% (n=57/72) of which felt would reduce duplication of testing & incorrect testing. Internal medicine residents agreed that having a telephone directory of radiologists would improve work-flow (99%, n=71/72). 42% (n=10) of radiology residents felt increased communication would decrease work-flow.

Pannell & Tyrrell-Price (2017)	To assess primary-specialty method of communication & characteristics of method results.	Prospective cross-sectional quality improvement project	N=80 providers	57.1% (n=16) of providers returned phone calls, with an average return call time of almost 6 hours. Phone conversations lasted an average of 4 minutes and 22 seconds. Searching for information in the EMR took 1 minute 47 seconds on average. The EMR was accessible at any time, whereas provider availability for a phone call required more strategy.	PCM

Chew-Graham, Slade, Montana, Stewart, & Gask (2008)	To evaluate primary-to-secondary care referral frustrations.	Nested qualitative study within a RCT	N=17 mental health team leaders and consultant psychiatrists.	Providers described the perceived fragmentation of care associated with lack of provider-to-provider direct communication. They sometimes alleviated this problem by communication via the phone.	PCM, OPC
Safford (2018)	To discuss service agreements between primary & specialty care.	Expert Opinion	n/a	A service agreement that facilitates 'a warm handoff' and informal primary-specialty provider communication was recommended.	PCM

Cohen (1998)	To describe a cardiology consultation.	Expert Opinion	n/a	This was a description of effective cardiology consultations. Suggesting the ability to ask questions directly via telephone.	PCM
Feurstein, Sheppard, Cheifez, & Ariyabuddhiphongs (2016)	To discuss implementation of a medical neighborhood.	Focus group	UNK	A patient navigator may be used to help streamline communication between primary & specialty care, but the team felt this role may unfeasibly increase cost.	PCM, OPC

Sewell, Guy, Kwon, Chen, & Yee (2013)	To determine appropriateness of pre-consultation in an urban safety net hospital.	Retrospective cohort study	N=413 patient charts	13.6% (n=56) were deemed appropriate for pre-consult management based on predetermined inclusion & exclusion criteria. In all but one of the appropriate pre-consults, the specialist was able to answer questions without seeing the patient in person, & in one case, the specialist indicated the patient should be referred to a different specialty. The quality of communication	OPC

				directly impacted the ability to determine appropriateness of pre-consult exchange. Reasons for pre-consultation requests deemed inappropriate were disease severity, acuity, or complexity.	
Price, Sewell, Chen & Sarkar (2016)	To evaluate pre-consultation safety.	Retrospective cohort study	N=266 patient referrals	32% (n=86) of the patient referrals were managed via pre-consultation exchange. Five referrals were coded as at least moderate harm, but harm was deemed unrelated to	FPC, OPC

				the e-referral process. In these cases, harm was associated with normal disease progression, & required a higher level of acute care unrelated to immediate specialist referral. E-consults were concluded to be relatively safe.	
Scheibe et. al. (2015)	To evaluate the use of Health Information Technology in the referral process in a	Retrospective cohort study	N=2,105 patient referrals	Up to 74% of referrals utilized pre-consultation exchange, with the average response time being 1-4 days. Pre-consultation exchange	FPC, OPC

	safety net hospital.	was defined as any provider-to-provider communication prior to, or surrounding, the decision to refer. 61% (n=156) of referrals were appropriate for pre-consultation exchange. 25% (n=39) of those referrals were managed via pre-consultation exchange, thus avoiding unnecessary specialist visits.

Note. IM= Internal Medicine; PCE = Pre-consultation exchange; RCT = randomized controlled trial; UNK = unknown; FPC= Frequency of pre-consultation communication; OPC= Outcome of pre-consultation communication; PCM=Pre-consultation communication method.

Providers value pre-consultation communication, specifically readily available open avenues for communication, closed-loop communication, and "warm handoffs" with other providers, yet many providers do not use pre-consultation communication on a regular basis (Cohen, 1998; McPhee et al., 1984; Safford, 2018; Sewell et al., 2014; Won & Rosenkrantz, 2017). The analysis of articles revealed the FPC, with direct communication occurring as little as 9% of the time (McPhee et al., 1984), and as often as 84% of the time (Scheibe et. al., 2015). Pre-consultation communication has clear benefits for patients, providers, and the healthcare system as a whole. Direct communication improves care, increases closed-loop communication, allows for a change in management that otherwise may not have occurred, increases overall efficiency of patient care with correct diagnostics and treatment, and decreases duplication (Chew-Graham et al., 2008; Klobuka et al., 2019; McPhee et al., 1984; Pannell & Tyrell-Price, 2017; Won & Rosenkrantz, 2017).

The analysis of articles revealed several PCMs. Methods included (1) telephone contact (Cohen, 1998; McPhee et al., 1984; Safford, 2018; Sewell et al., 2014; Won & Rosenkrantz, 2017), (2) "warm-handoffs" (Safford, 2018), (3) patient navigators (Feuerstien et al., 2016) and (4) direct contact with the use of electronic messaging via email or e-referral (Pannell & Tyrrell-Price, 2017; Price et al., 2016; Scheibe et al., 2015; Sewell et al., 2014). Direct contact with the use of a telephone was the most common PCM (Cohen, 1998; McPhee et al., 1984; Safford, 2018; Sewell et al., 2014; Won & Rosenkrantz, 2017). Articles revealed that as much as 87% of usage was conducted via telephone, and 70.7% of providers used pre-consultation for the purpose of answering quick clinical questions (Sewell et al., 2014). Providers desired the ability to directly

discuss quick clinical questions with specialists and felt that a specialist telephone directory would reduce health care inefficiencies (Sewell et al., 2014).

The second most common PCM was electronic messaging or e-referral (Pannell & Tyrrell-Price, 2017; Price et al., 2016; Scheibe et al., 2015; Sewell et al., 2014). The use of either electronic or telephone communication for pre-consultations may have resulted in delays in care, as specialists' response times varied (Pannell & Tyrrell-Price, 2017). Two of the articles discussed communication between primary providers and radiologists, which may not be fully transferable to the primary-specialty communication interface because job duties and workflow between primary care and radiologists vary (Klobuka et al., 2019; Won & Rosenkrantz, 2017). Radiologists typically used electronic one-way communication via the EHR to communicate their findings and impressions with the primary provider. These articles are not a direct reflection of primary-(non-radiology) specialty pre-consultation given that they involve a radiologist, but the direct communication platforms in the radiology setting may be comparable to the primary-specialty (non-radiology) pre-consultation setting.

Three articles discussed the concept of a formal standardized pre-consultation (Price et al., 2016; Scheibe et al., 2015; Sewell et al., 2013). Pre-consultation can be used to ask a quick clinical question with or without an intent to refer a patient, to electronically request a referral, and to manage a pre-consultation workup. The method of implementation in the three articles was via EHR as part of the e-referral, whereby each pre-consultation was funneled through as an e-referral regardless of intent to refer (Price et al., 2016; Scheibe et al., 2015; Sewell et al., 2013). Almost 3,000 patient charts were included in the three articles, thus providing more data than data supporting either

of the other two themes. Between 13% and 74% of referrals were deemed appropriate for pre-consultation, the vast majority of which helped to avoid unnecessary in-person specialist visits (Price et al., 2016; Scheibe et al., 2015; Sewell et al., 2013). Of note, pre-consultation can be used for quick clinical questions as well as true intents to request a referral with accompanying communication. Of the three studies that included pre-consultation use, none of them discussed providers' intents in use (Price et al., 2016; Scheibe et. al., 2015; Sewell at al., 2013). All three studies associated the quality of communication and specific pre-consultation inclusion and exclusion criteria with the ability to determine appropriateness, and avoided up to 32% of unnecessary specialist visits (Price et al., 2016).

The analysis of articles revealed OPC. The ability to communicate directly to ask clinical questions lead to improved patient care in the form of corrected diagnoses, acuities, and management (Won & Rosenkrantz, 2017), as well as decreased duplication of testing (Klobuka et al., 2019). Closed loop communication was much more likely to occur after direct pre-consultation communication (McPhee et al., 1984). Providers felt that lack of direct communication lead to fragmentation of care (Chew-Graham et al., 2008). A portion of patient referral requests were safe and appropriate for pre-consult management (Price et al., 2016; Sewell et al., 2013). Pre-consult management reduced unnecessary referrals to specialists by answering clinical questions (Scheibe et. al., 2015; Sewell et al., 2013).

Some pre-consultation details were not discussed in the article analysis. Pre-consultation integration was described fairly well. However, the PCMs, the processes of PCM implementation, and theoretical frameworks were rarely, if ever, explicitly

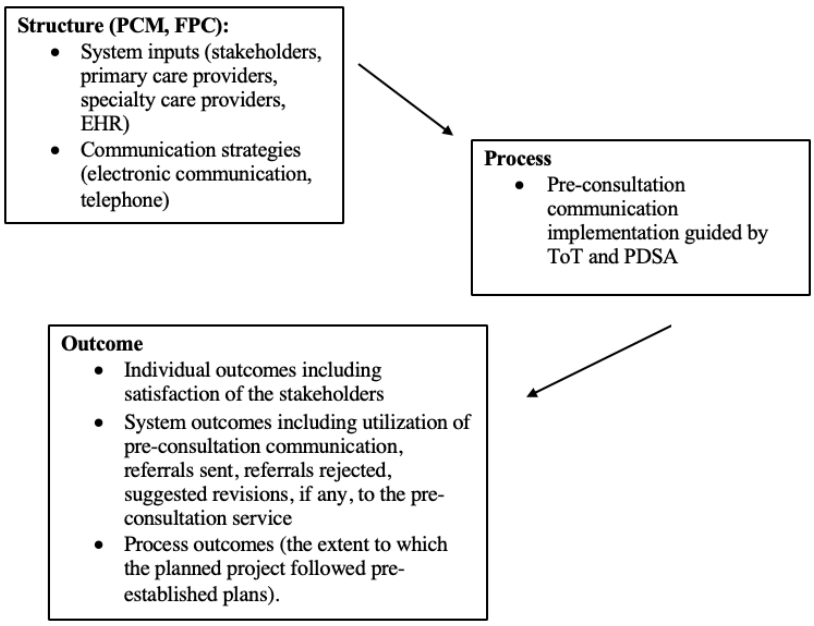
discussed (Price et al., 2016; Scheibe et. al., 2015; Sewell et al., 2013; Sewell et al., 2014). Further, the intent in use of pre-consultation was rarely delineated (Price et al., 2016; Scheibe et. al., 2015; Sewell et al., 2013; Sewell et al., 2014). While only one article distinguished between how many pre-consultation users communicated via telephone versus electronically, and how many accessed pre-consultations for specific various reasons, 451 providers participated in the study (Sewell et al., 2014). Three of the articles were descriptive designs developed from expert opinion (Cohen, 1998; Feuerstein et al., 2016; Safford, 2018). Studies with higher levels of evidence would strengthen the research. The nature of pre-consultations largely involves communication and personal provider satisfaction. This may explain the presence of studies with level four evidence and smaller amount of existing knowledge.

SECTION 3

THEORETICAL FRAMEWORK

The organizational framework used for this project was the Donabedian model. The Donabedian model suggests that structure (PCM and FPC) and process influence the optimization of outcomes (OPC) (Donabedian, 1988). Figure 3.1. displays the organizing framework adapted to this project.

Figure 3.1
Depiction of the Donabedian Model



Note. Concept map of the Donabedian model. PCM=Pre-consultation method; FPC=frequency of pre-consultation communication; EHR=electronic health record; ToT=training of the trainers; PDSA= Plan-Do-Study-Act. Adapted from Donabedian, A. (1988). The quality of care: How can it be assessed? *Journal of the American Medical Association*, *260*(12), 1743-1748. doi:10.1001/jama.1988.03410120089033

Structure

Structural measures lay the foundation for the health care setting and describe the context of health care delivery (Donabedian, 1988). Structure affects process and outcomes (Donabedian, 1988). Structural measures specific to this project include stakeholders, primary care and specialty care providers in the health system, the EHR used by the health system, the PCM and FPC.

Multiple PCMs discovered in the literature included (1) telephone contact (Cohen, 1998; McPhee et al., 1984; Safford, 2018; Sewell et al., 2014; Won & Rosenkrantz, 2017), (2) warm-handoffs (Safford, 2018), (3) patient navigators (Feuerstien et al., 2016) and (4) electronic messaging via email or e-referral (Pannell & Tyrrell-Price, 2017; Price et al., 2016; Scheibe et al., 2015; Sewell et al., 2014). Structure (PCM) affects outcomes such as an improved perception of workflow efficiency (Klobuka et al., 2019), and a perceived reduction in fragmentation of care (Chew-Graham et al., 2008).

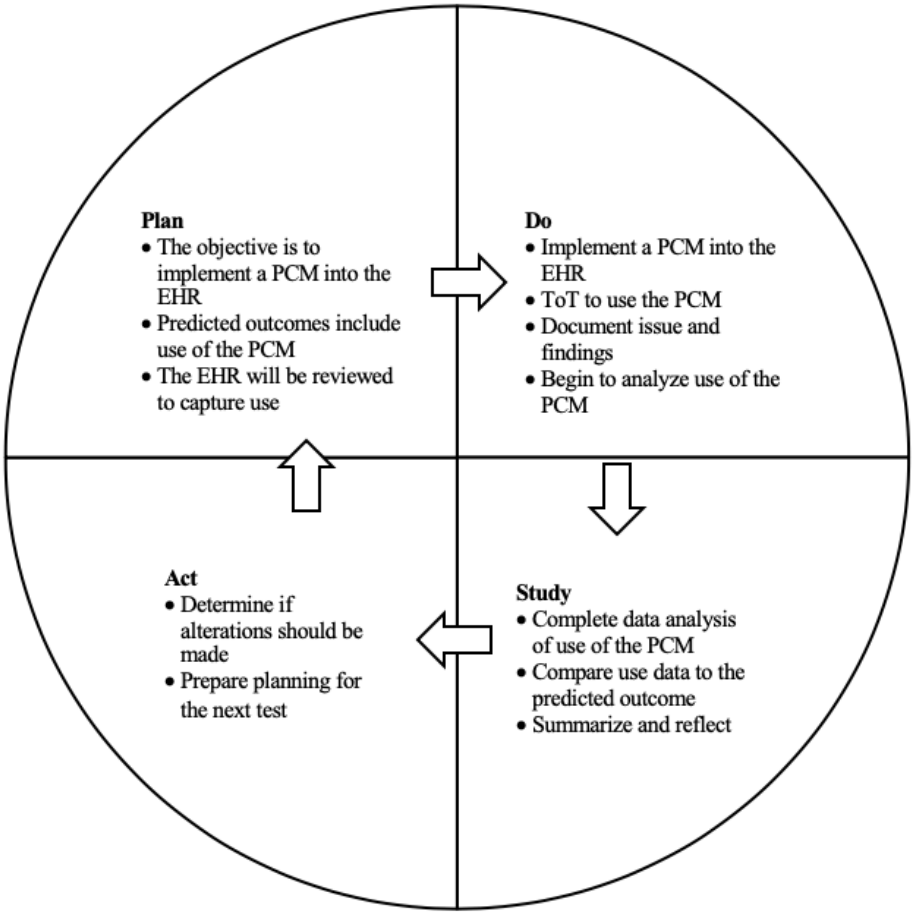
FPC is a structural factor that affects outcomes on an individual level. The analysis of articles revealed the frequency of communication, with direct communication occurring as little as 9% of the time (McPhee et al., 1984), and as often as 84% of the time (Scheibe et al., 2015). Process (FPC) affects outcomes such as closed loop communication (McPhee et al., 1984), and reduction of unnecessary referrals (Scheibe et. al., 2015).

Process

Process measures describe the actions and practices of health care (Donabedian, 1988). Process measures include pre-consultation communication implementation guided by training of the trainer (ToT) and plan-do-study-act (PDSA). The PCM implementation tool is the aggregate unit of analysis using PDSA cycles and ToT.

The PDSA Model will be used to implement and evaluate the integration of the PCM into the health care system as a quality improvement (QI) project (Institute for Healthcare Improvement, n.d.). Figure 3.2 depicts the application of the PDSA Model within the context of this QI project (Institute for Healthcare Improvement, n.d.).

Figure 3.2
Depiction of the Plan-Do-Study-Act model

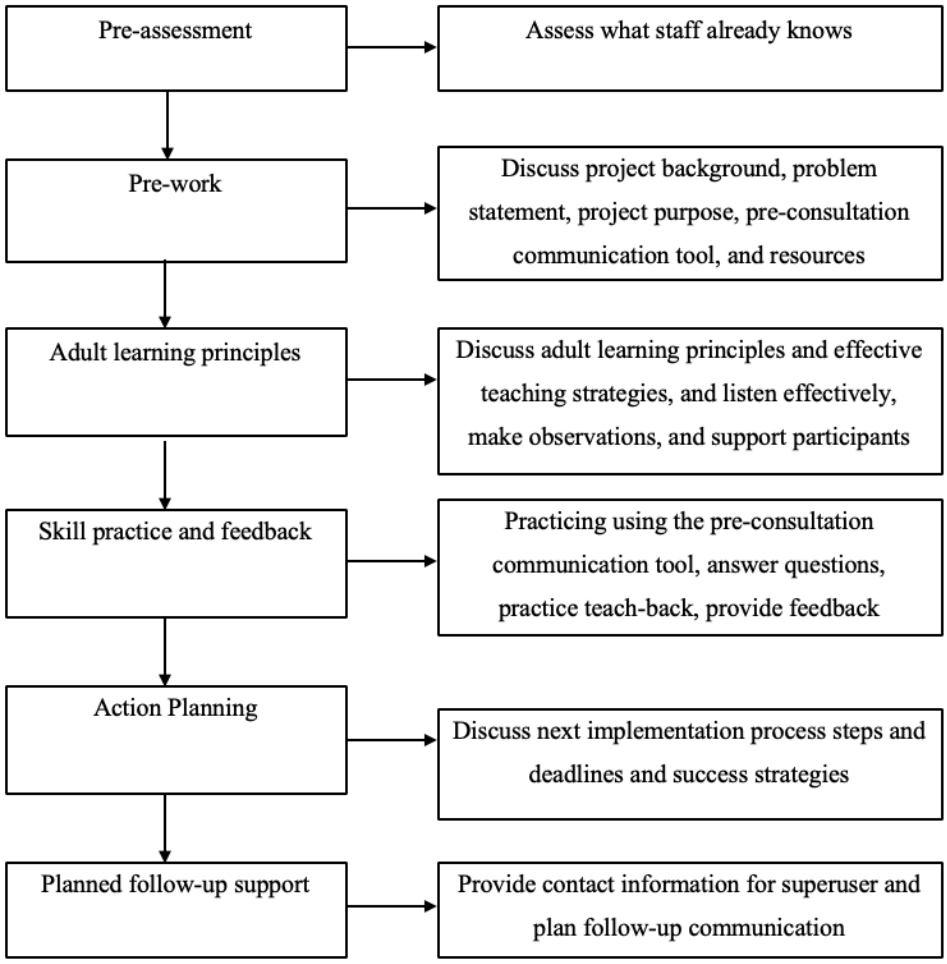


Note. The Plan-Do-Study-Act model was used to implement and evaluate the integration of the PCM into the urban health care system as a Quality Improvement project.

Implementation of a PCM within a health care system requires system-wide provider training. Leadership will be trained in a top-down approach whereby a ToT will be used to disseminate knowledge. The purpose of the ToT model is to efficiently

streamline the training process by preparing master trainers to train staff (CDC, n.d.). Master trainers are then able to simultaneously train staff in their individual settings rather than requiring one intensive mandatory training session (CDC, n.d.). Figure 3.3 depicts the application of the ToT model within the context of this project.

Figure 3.3
Concept Map of the ToT Model



Note. Concept Map of the ToT Model. Adapted from Center for Disease Control. (n.d.). Understanding the Training of Trainers Model. Retrieved from https://www.cdc.gov/healthyschools/professional_development/documents/17_279600_TrainersModel-FactSheet_v3_508Final.pdf

The ToT model allows for the efficient transfer of knowledge and has been used in many large and small health care settings to disseminate information (Kalisch et al.,

2013; Marks et al., 2013; Wittenberg et al., 2018). Research shows that ToT consistently improves care (Kalisch et al., 2013; Marks et al., 2013; Wittenberg et al., 2018). On a nationwide scale, the National Cancer Institute implemented a training course for nurses using the ToT Model, and participants in turn made system-wide changes in 34 different states (Wittenberg et al., 2018). The ToT model will be operationalized in this specific project by training leaders who will then train providers in each specialty and primary care clinic. This will allow for a more efficient transfer of knowledge to avoid the long inefficient process of one individual training all providers.

Outcomes

Outcomes are the effects of health care's structure and process on the individual or system (Donabedian, 1988). Individual outcome measures in this project include stakeholder satisfaction. System outcomes include utilization of pre-consultation communication, and the impact, if any, on referrals sent and referrals rejected following pre-consultation communication. Process outcomes include stakeholders' and pre-consultation users' suggested revisions to the implementation process and the extent to which the planned projected followed the pre-established plan.

King's Goal Attainment Theory

Imogine King's goal attainment theory was used as a conceptual framework for this project. The primary stakeholders of the urban health system served as the project facilitator's (PF) client. King suggested that goals are attained through the interaction between the individual (the urban health system's primary stakeholders), the interpersonal system (the PF and the stakeholders' collaboration), and the social system (the urban health care system) (King, 1999). These three systems interacted

collaboratively to set a goal, determine an achievement plan, and ultimately attain the goal (King, 1999). The individuals (primary stakeholders) identified a health care inefficiency caused by insufficient communication between primary providers and specialty providers. The stakeholders determined they would like to improve pre-consultation communication within a year. The interpersonal system included a collaborative transaction between the PF and the stakeholders to foster communication to align goals and formulate a procedural plan. The social system (the urban health system) fosters and prioritizes interpersonal collaboration and communication, thus creating an environment for communication improvement goals to thrive.

This project will ultimately serve to advance nursing at the organizational level. Theories and models were used in this project to help maneuver the environment in such a way that health was promoted. The Donabedian model, PDSA cycles and ToT were used to create an environment in which enhanced communication between providers could take place in order to ultimately affect health outcomes. King's theory of goal attainment was used as a conceptual framework congruent with the discipline of nursing. This health care system depends on provider-to-provider communication and organizational policies. Extensive assessment of the organization, therapeutic relationship-building with stakeholders and leadership, the careful use of models and theories in the project design, evaluation of evidence-based practice in the context of the system as a whole, and the analysis of structure, process, and outcomes through the Donabedian model all demonstrate advanced nursing practice.

SECTION 4

METHODS

The purpose of this project is to address communication inadequacies between primary care and specialty providers by introducing a system-wide pre-consultation communication platform. This project will be conducted in an urban safety-net health system using the Donabedian model, PDSA cycles, and ToT. A safety-net health system is one that provides care to a substantial number of patients without insurance or with Medicaid (Sutton et al., 2016). The overall goal of this project is to improve communication between primary care and specialty care providers. The time series design will be used to implement and evaluate the pre-consultation service. Table 4.1 describes the elements of the time series design adapted to this project. Project data will be evaluated approximately every three weeks to monitor changes, if any, from baseline.

Table 4.1

Time Series Design Description

Time Series Label	Description
T 0-1	Baseline data from previous year
T 1	Intervention Implementation date
T 2, T 3, T 4, etc.	3-week interval post implementation data

Note. T=time.

Structure: Setting and Sample

The setting for this project will be in an urban safety-net health system in a western state. This health system includes a 525-bed hospital that cares for 30% of the city's population annually (Denver Health, 2019). The volume seen at this hospital is approximately 930,000 patient visits annually (Denver Health, 2019). There are 24 outpatient specialty clinics, eight public health clinics, and 10 primary care clinics. The health system serves 207 public schools through its school-based clinics (Denver Health, 2019). There are over 7,000 employees (Denver Health, 2019). The EHR used by all employees involved in direct patient care is EPIC. This health system fosters the concept of a medical neighborhood in which providers work collaboratively to provide patient-centered quality care (B. Neuhalfen and T. Freudig, personal communication, September 4, 2019). The PF conducted years of her doctoral studies at this urban health system. The PF experienced first-hand the health care inefficiencies caused by poor provider-to-provider communication. More specifically, the PF witnessed the negative outcomes associated with the lack of pre-consultation options.

The PF identified primary stakeholders including the program administrator of the medical neighborhood and a nurse educator during the spring of 2019. Secondary stakeholders were identified as chiefs of the following services: medical, surgical, women's health, orthopedics, and family medicine including primary care, pediatrics, and internal medicine. Tertiary stakeholders were identified as all primary and specialty care providers.

A needs assessment was conducted with primary stakeholders along with the input from other health system leaders. Appendix A references the strengths-weaknesses-opportunities-threats (SWOT) analysis performed prior to this proposed project. Major strengths included a system-wide general desire to improve communication, foster relationship building and collaboration, and promote a patient-centered medical home and medical neighborhood. The National Committee for Quality Assurance (NCQA) is an accreditation and recognition body that works to foster patient-centered care by improving collaboration and communication between primary and specialty care. The health system currently holds national recognition from the NCQA for its patient centered medical home and strives to promote actions like communication improvement efforts seen in this project. This project serves as a part of the health system's larger plan to improve overall communication between primary and specialty care providers. Major weaknesses included varying provider objectives and roles leading to buy-in barriers, and longstanding discontent with the referral process leading to provider burnout.

The stakeholders reported approximately 4,429 patients were referred each month (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019). The referral rejection rate was 6.19% between January and August 2019, with a rate as high as 7.4% for the month of January (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019). The stakeholders believed that inefficient pre-consultation communication hindered rejection rate improvement (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019). Reasons for rejected referrals included (1) referring to the incorrect specialty, (2) referring when not clinically appropriate, (3)

duplicate or erroneous referring, (4) referring without sufficient patient information (e.g. test results were needed), (5) referring outside institutional referral guidelines, or (6) referring when the patient was already receiving appropriate care (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019).

Stakeholders performed a mixed-methods survey of their system's providers (N=54) to establish a baseline need for improved pre-consult communication. Fifty-five percent (n=30) of providers reported unhappiness with the current practice and supported the introduction of a pre-consultation pathway (B. Neuhalfen & T. Freudig, personal communication, September 4, 2019). Currently, primary care providers can only ask questions or dialogue with specialists prior to referral if they have established relationships with specialists (B. Neuhalfen & T. Freudig, personal communication, March 11, 2019). There is no formal pre-consultation pathway for providers (B. Neuhalfen & T. Freudig, personal communication, March 11, 2019). Stakeholders concluded that the absence of a pre-consultation communication pathway led to inappropriate referrals, delays in care, and patient and provider dissatisfaction (B. Neuhalfen & T. Freudig, personal communication, March 11, 2019).

Process: Procedures and Ethical Considerations

Procedures. The PDSA Model will be used to introduce a pre-consultation platform into the urban health system. Initially, the pre-consultation platform will consist of developing or modifying a system-wide policy for the use of an on-call specialist list and chat feature that currently exists but is rarely used by providers for pre-consultation. Implementation will continue, if time allows, with embedding the on-call specialist list into the EHR. An approximate timeline of proposed procedures is described in Table

4.2. It is possible that the timeline will need to be modified due to system, provider, and/or stakeholder schedules. At least one PDSA cycle is planned. Additional PDSA cycles will continue as time allows. All deviations from the proposed timeline will be evaluated and considered in light of project findings.

Table 4.2

Timeline of Proposed Procedures

PDSA Step	Timeline	Procedures	Person(s) Responsible
C1: Plan	Prior to week 1	1. Needs assessment completed. 2. Systematic integrated literature review completed. 3. Articulation of project problem, purpose, theoretical framework, methods, & design. 4. CITI training & IRB application completed. 5. System policies on provider-to-provider communication identified (if they exist).	PF
C1: Do	Week 1-5	1. Modify existing policy or create new policy on pre-consultation provider communication via on-call specialist list and secure chat feature. Follow health system's process for policy adoption or modification. 2. Notify health system staff of the new or modified policy via a system-wide email.	PF, Primary Stakeholders

C1: Study	Week 5	Administer a one-question survey to primary stakeholders asking them to assess their perception of goal attainment.	PF
C1: Act	Week 6	Determine if alterations to the policy or the process of its introduction should be made based on the goal attainment survey.	PF
C2: Plan	Week 7	1. Plan for the introduction of a pre-consultation communication option in the form of an embedded on-call specialist list into the EHR. 2. Meet with hospital IT to discuss the introduction of a pre-consultation communication option and a proposed start date.	PF, Primary Stakeholders, IT
C2: Do	Week 8-10	Develop training materials for utilizing pre-consultation platform.	PF, Primary Stakeholders
C2: Do	Week 10-14	Create a pre-consultation communication option by embedding the on-call specialist list into the EHR with an estimated go-live date 4 weeks after the start date.	PF, IT
C2: Do	Week 14-18	Train the trainers (stakeholders) on use of the pre-consultation communication option. The pre-consultation communication option guidelines will be available in 3 different teaching forms (a paper document, an email, and a PowerPoint).	PF, Primary & Secondary Stakeholders

C2: Do	Week 14	Administer a one-question survey assessing stakeholder readiness to train providers (Appendix B) in the use of the pre-consultation communication option.	PF, Primary & Secondary Stakeholders
C2: DO	Week 14-18	Training of PCPs and medical specialists on use of pre-consultation communication option.	Primary & Secondary Stakeholders

Note: C= cycle; EHR= electronic health record; IT= information technology; PDSA= Plan Do Study Act; PF= project facilitator; ToT= Training of the Trainer; CITI= Collaborative Institutional Training Initiative.

Ethical Considerations. Protection of human subjects was considered. Institutional Review Board (IRB) training was completed with Collaborative Institutional Training Initiative (CITI) modules for social and behavioral research. A request for determination of human subject research was submitted. The IRB determined that this project did not constitute research involving human subjects. Appendix D references the IRB letter. This project was deemed a quality improvement project. This project is ethical in that it provides an opportunity for stakeholders, in conjunction with the PF, to assess baseline pre-consultation communication practices among system providers, implement new or modified provider pre-consultation communication strategies, and evaluate the impact of those strategies on health system outcomes (Silva & Ludwick, 2006).

Outcomes: Data, Instrumentation, Planned Analysis, and Potential Significance

Planned Data Collection and Analysis. The planned data to be collected in this project and the analysis plans are shown in Table 4.3. The levels of analysis and planned statistics are identified for each datum. After the policy is either created or modified, primary stakeholders will gauge their perception of goal attainment via a one-question Likert scale survey. Appendix E references the survey. Success will be measured as an answer of strongly agree by all primary stakeholders. In conjunction with PDSA cycle 2, baseline data will be de-identified and aggregated by primary stakeholders and reported to the PF. The stakeholder training materials will be developed in conjunction with primary stakeholders and formatted for a handout, email, or PowerPoint for secondary stakeholders to distribute to tertiary stakeholders. Appendix C references the guideline for pre-consultation communication platform (PCCP) utilization. The PF will administer

a one-question survey to the secondary stakeholders as part of the ToT process asking secondary stakeholders to assess their readiness to train providers in the use of the PCCP. The PF will use a 5-point Likert scale where 1 = strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. Stakeholders must score 4 or 5 on the Likert scale in order to teach providers how to use the PCCP. Appendix B references the one-question survey.

The PF will meet with the stakeholders approximately every three weeks during the project period to gather the aggregated data on the PCCP utilization and referral rejection rates if time allows. Upon completion of the PDSA cycle(s), the number of rejected referrals for PCCP users and non-users will be determined. The relationship, if any, between PCCP use and referral rejection will be examined via correlation analysis.

Table 4.3
Planned Data Collection and Analysis

Datum	Level of Measurement	Planned Statistics
PDSA C1		
Stakeholder perception of goal attainment via a survey	Ordinal	Frequencies, Percentages
Baseline PDSA C2+		
Stakeholder readiness to train providers in the use of the PCCP via Likert scale.	Ordinal	Frequencies, Percentages
Total # of referrals sent during the 12 months prior to project start date	Ratio	Frequencies, Percentages

Total # of referrals rejected during the 12 months prior to the project start date	Ratio	Frequencies, Percentages, Rate
Every Three Weeks PDSA C2+		
# of times PCCP is used during PDSA cycle	Ratio	Frequencies, Percentages
PCCP users by provider type (PCPs [MD, DO, NP, PA, medical specialists)	Ratio	Frequencies, Percentages, Rate
# of referral requests that were sent	Ratio	Frequencies, Percentages
# of referral requests that were rejected	Ratio	Frequencies, Percentages, Rate
# of rejected referral requests where PCCP was used	Ratio	Frequencies, Percentages, Rate
Completion of Total PDSA Cycle(s)		
# of rejected referrals for PCCP users	Ratio	Frequencies, Percentages, Rate, Correlation

# of rejected referrals for PCCP non-users	Ratio	Frequencies, Percentages, Rate, Correlation

Note. PCCP=pre-consultation communication platform, #=number, PDSA= plan-do-study-act, PCP= primary care provider, MD= doctor of medicine, DO= doctor of osteopathic medicine, NP= nurse practitioner, PA= physician assistant, C2+= cycle 2 & greater, C1= cycle 1.

The PF will enter all aggregated data into an Excel spreadsheet using a double-entry technique. Errors in data entry will be corrected by the PF during the double-entry process. The spreadsheet will be maintained on the PF's personal computer and will be password protected. Ordinal level data will be analyzed by frequencies and percentages. Ratio level data will be analyzed by frequencies, percentages, and rates and correlations where applicable. Project success (e.g. successful introduction of the PCCP) will be defined as consistent use of the PCCP by primary care and medical specialist providers. Consistent use is defined as a rate of greater than zero at each 3-week interval.

This project addresses a gap in clinical practice and aims to improve communication shortcomings between primary care and specialty care providers in an urban health system. It has the potential to improve care and satisfaction for the roughly 4,429 patients referred each month within this health system, as well as improve provider satisfaction. The systematic approach taken to solve health care inefficiency yields a transferable process that can be used to address future problems.

SECTION 5

RESULTS

The project process laid the foundation for the project results. The process evaluation revealed one major deviation in the planned interventions that impacted the project. In week one, the on-call specialist list was embedded into the EHR, where IT previously indicated it would not be possible. Because of this, PDSA cycles 1 and 2 occurred simultaneously. This allowed for a single ToT in lieu of multiple ToT sessions with each additionally implemented tool. While this created a heavy workload on the frontend, it led to a more seamless training that included all of the available PCCP tools. Table 5.1 describes the timeline of the planned intervention as compared to the timeline of the actual intervention.

Table 5.1

Timeline of the Planned Intervention and Actual Intervention

Timeline of PI	PI	Timeline of AI	AI
Prior to Week 1	1. Needs assessment completed. 2. Systematic integrated literature review completed. 3. Formation of project problem, purpose,	Prior to Week 1	1. Needs assessment completed. 2. Systematic integrated literature review completed. 3. Formation of project problem, purpose,

	theoretical framework, methods, & design completed. 4. CITI training & IRB application completed. 5. Identify system policies on provider-to-provider communication (if they exist).		theoretical framework, methods, & design completed. 4. CITI training & IRB application completed. 5. System policies on provider-to-provider communication identified and modified to address a provider-to-provider pre-consultation platform.
Weeks 1-5	1. Modify existing policy or create new policy on pre-consultation provider communication via on-call specialist list and secure chat feature. Follow health system's process for policy adoption or modification.	Week 1	1. Planned for the introduction of a pre-consultation communication option in the form of an embedded on-call specialist list into the EHR. 2. Met with hospital IT to discuss the introduction of a pre-consultation

	2. Notify health system staff of the new or modified policy via a system-wide email.		communication option and a proposed start date. 3. Created a pre-consultation communication option by embedding the on-call specialist list into the EHR with an estimated go-live date 3 weeks after the start date.
Week 5	Administer a one-question survey to primary stakeholders asking them to assess their perception of goal attainment.	Week 2-3	1. Created a new policy entitled Pre-consultation Between Services for Outpatient Patients, adapted from an existing guideline (Appendix I). 2. Developed training materials for utilizing pre-consultation platform (a PowerPoint, one-page paper

			document, and an email [Appendices F, G, and H]).
Week 6	Determine if alterations to the policy or the process of its introduction should be made based on the goal attainment survey.	Week 4	1. Notified health system staff of the new or modified policy via a system-wide email. 2. Administered a one-question survey to primary stakeholders asking them to assess their perception of goal attainment (Appendix E). 3. Determined if alterations to the policy or the process of its introduction should be made based on the goal attainment survey.
Week 7	1. Plan for the introduction of a pre-consultation	Week 5	1. Administered a one-question survey assessing stakeholder

	communication option in the form of an embedded on-call specialist list into the EHR. 6. Meet with hospital IT to discuss the introduction of a pre-consultation communication option and a proposed start date.		readiness to train providers (Appendix B) in the use of the pre-consultation communication option. 2. Train the trainers (primary and secondary stakeholders) on use of the pre-consultation communication option occurred. The pre-consultation communication option guidelines were available in 3 different teaching forms (a paper document, an email, and a PowerPoint [Appendices F, G, and H]).
Week 8-10	Develop training materials for utilizing pre-consultation platform.	Week 6-8	Training of PCPs and medical specialists on use of pre-

		consultation communication option occurred.
Week 10-14	Create a pre-consultation communication option by embedding the on-call specialist list into the EHR with an estimated go-live date 4 weeks after the start date.	
Week 14-18	Train the trainers (stakeholders) on use of the pre-consultation communication option. The pre-consultation communication option guidelines will be available in 3 different teaching forms (a paper document, an email, and a PowerPoint).	
Week 14	Administer a one-question survey assessing stakeholder readiness to train providers (Appendix B) in the use of	

	the pre-consultation communication option.
Week 14-18	Training of PCPs and medical specialists on use of pre-consultation communication option.

Note: PI= planned implementation; AI= actual implementation; EHR= electronic health record; IT= information technology; PDSA= Plan Do Study Act; PF= project facilitator; ToT= Training of the Trainer; CITI= Collaborative Institutional Training Initiative.

Measurable Outcomes

Project outcome measurements were chosen based on King's theory of goal attainment. The primary stakeholders completed the one-question Likert scale goal attainment survey following the end of the Plan and Do portion of the first and second PDSA cycle. The primary stakeholders (n=2) both specified they strongly agreed, thus indicating their goal was attained. Appendix E references the Goal Attainment Survey. Prior to the ToTs meeting with the secondary stakeholders, the secondary stakeholders completed the one-question Likert scale readiness to train survey. All secondary stakeholders (n=22) specified they strongly agreed, thus indicating they were ready and willing to train their staff on the use of the PCCP. Appendix B references the Readiness to Train Survey. Likert scales have long been used in research to measure subjective data (Willits, Theodori, & Luloff, 2016; Croasmun & Ostrom, 2011). While the Likert scale may introduce bias, it has been found to be a valid and reliable tool in research for

evaluating subjective information (Croasmun & Ostrom, 2011). Project objectives were met based on the overall aim of goal attainment.

SECTION 6

DISCUSSION

The purpose of this project was to address communication inadequacies between primary care and specialty providers by introducing system-wide pre-consultation communication options. The literature review supported the use of pre-consultation methods to improve patient outcomes (Klobuka et al., 2019; Scheibe et. al., 2015; Sewell et al., 2013; Won & Rosenkrantz, 2017). The literature review did not reveal methods of implementation. Additional research was conducted to prompt and justify the use of the Donabedian model, PDSA cycles, ToT, and King's goal attainment theory as the theoretical frameworks and methods that guided the project. The majority of the research consisted of cohort studies, and more randomized controlled trials would have further informed the project.

Planned implementation varied from actual implementation, and those findings were evaluated in the process evaluation. One possible cause of the deviation was the complexity of the large hospital system with a large number of clinics and employees. Any change to the EHR affected all employees that had access to the EHR for patient care. The unexpected concurrent implementation of PDSA cycles one and two was largely beneficial in that the policy and training included all of the available pre-consultation options, thus eliminating the need to addend and retrain as new options became available. This caused a heavy workload in the beginning of the project, which

was feasible, however completion of the simultaneous PDSA cycles in eight weeks hinged upon timing flexibility that may not always be possible in the future.

Limitations of the new tool surrounded the inability to track usage at the time of implementation. The initially proposed outcomes measurement plan included usage and its relationship to referral rejection rates. Given the inability to track usage, this data could not be collected as planned, thus affecting the ability to understand patient outcome trends and how they related to the literature.

Project Significance

The project demonstrated actual significance and future potential significance. Actual significance included a clinically significant difference. The PF was able to create a pre-consultation communication platform in a large hospital system. The PF was able to create training material and operationalize Training of the Trainer to support training of all providers in the system. Imogene King suggested that goals are attained through the interaction between the individual (the urban health system's primary stakeholders), the interpersonal system (the PF and the stakeholders' collaboration), and the social system (the urban health care system) (King, 1999). The primary stakeholders indicated their goal of improving pre-consultation communication was met, which was clinically significant. This finding was consistent with the literature whereby improved provider-to-provider communication avenues leads to improved satisfaction (Forrest et al., 2000; O'Malley & Reschovsky, 2011; Stille et al., 2006). The project advances nursing practice by addressing a gap in clinical practice at the organizational level, demonstrating a transferable process, and operationalizing DNP core competencies to create a clinically significant outcome. Table 6.1 describes DNP core competencies addressed in this project.

Table 6.1
DNP Essentials Operationalized in this Project to Advance Nursing Practice

DNP Essential	DNP Essential Operationalized to Scholarly Project
1; 8	Scientific underpinnings included theories & models (the Donabedian model, PDSA cycles, ToT, and King's Goal Attainment theory) were used to design the project and to identify strengths to modify the environment to promote health.
2	Organizational leadership & interprofessional collaboration for systems-level QI occurred with primary stakeholders & leadership teams by collaborating to identify and achieve a goal.
3	Clinical scholarship and analytical methods for evidence-based practice was demonstrated. Science was evaluated and translated systematically in the integrated literature review. Teaching was systematic through the ToT. The project was documented, peer-reviewed, and disseminated.
4	Information systems were used to improve patient outcomes.
1; 2; 3; 4; 6; 8	This project demonstrated advanced nursing practice. It evaluated, translated, and disseminated research into practice. Models and theories were used in the project design to help maneuver the system environment to

	promote health. Policy and IT were used to enhance outcomes. Ethical reasoning was considered. An extensive assessment of an organization was completed, therapeutic relationship-building with primary and secondary stakeholders, and leadership, regularly occurred. The PF made a clinically significant difference.

Note: DNP= Doctor of Nursing Practice, QI= Quality Improvement, IRB= Institutional Review Board, CITI= Collaborative Institutional Training Initiative. Adapted from Zuchowski et al. (2015). Challenges in referral communication between VHA primary care and specialty care. *Journal of General Internal Medicine*, *30*(3), 305-311. Retrieved from https://link.springer.com/article/10.1007/s11606-014-3100-x

Research shows that poor provider-to-provider pre-consultation communication leads to reduced access to care and increased waste and cost, both of which lead to poor patient and provider outcomes (Bell et al., 2012; Gandhi et al., 2000; Murray, 2002; Zuchowski et al., 2015). Specifically, lack of formal communication pathways leads to longer wait times, rejected referrals, and delayed treatment (Lin, 2012; Murray, 2002). Limitations of the new tool surrounded the inability to track usage at the time of implementation. The initially proposed outcomes measurement plan included usage and its relationship to referral rejection rates. Given the inability to track usage, this data could not be collected as planned, thus affecting the ability to understand patient outcome trends and how they relate to the literature. Timing restrictions led to the project ending before there was time to recognize some of the potential outcomes, whose measurement was planned based on literature findings. In the future, potential significance could include improved care for the roughly 4500 patients referred each

month. Specifically, the PF would aim to potentially reduce referral rejections and specialist wait lists.

This project served as a portion of an overall goal of improving the pre-referral and referral process. The system is invested in sustaining and moving the project forward. Proposed future PDSA cycles include a cycle to work with IT to modify the tools to include a trackable feature. An additional PDSA cycle will include developing a formal new employee and resident training to include the PCCP, as this does not currently exist.

The PF considered what was learned and what could be done differently in the future when taking this process into a new setting or when addressing a new problem. The PF learned how to operationalize DNP core competencies to make a clinically significant change in a system with a theory-based intervention. In the future the PF should hone critical thinking skills to quickly adapt to system changes given the likelihood of changes to occur. Specifically, the PF will better demonstrate principals of Lewin's change theory where the PF will alter behavior to "unfreeze" the original plan to propel the project forward (Lewin, 1951). In addition, the PF will aim to utilize information technology to track tool usage to better understand trends and outcomes data. Dissemination of knowledge occurred. The project was submitted to the National Nurse Practitioner Symposium. The project was presented to the hospital system stakeholders, and to university colleagues.

Summary

The healthcare system is complex and ripe with inefficiencies that lead to negative consequences for patients and providers (Bell et al., 2012; Bentley et al., 2008; Lin, 2012; Murray, 2002; Zuchowski et al., 2015). One underlying cause of inefficiency

is inadequate or absent communication between primary and specialty care providers surrounding referral decision-making (Bentley et al., 2008; Lin, 2012; Murray, 2002). The purpose of this project was to address communication inadequacies between primary care and specialty providers by introducing a system wide PCCP. A transferrable process was applied, based on evidence-based practice through theories and models, to make a clinically significant difference. A PCCP was created in a large hospital system. Training of the trainers was used to train all primary, secondary, and tertiary stakeholders. King's Goal Attainment theory was used to guide measurement of outcomes. Primary stakeholders indicated their goal was attained, which was consistent with the literature. By introducing a PCCP, this project improved satisfaction as evidenced by goal attainment, demonstrated a transferable process that can now be used to solve problems in the future, and has the potential to improve patient outcomes.

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Appendix A

Strengths Weaknesses Opportunities, and Threats Analysis Summary

Strengths	Weaknesses
There is an existing desire between specialty and primary care to have better communication and relationship building.	Not every provider is here for the same reasons (patients, research, education). Priorities may vary, making it difficult to gain buy-in from all types of providers.
There is a general consensus that collaboration and improved communication is the right thing to do.	The appointment center serves a great need for centralized scheduling, but this leads to a lack of clinic to clinic opportunity for strengthening relationships.
There is a general desire to foster a patient-centered medical home (PCMH) and medical neighborhood within the system.	Providers are unhappy with the referral process, which has led to burn-out and tension between primary and specialty care. Some primary care providers even refer outside of the hospital system because of this. This information was deducted from a survey conducted by a primary stakeholder. In the past it has been difficult to disseminate information regarding new process changes.

Opportunities	Threats
The National Committee for Quality Assurance (NCQA) is an accreditation and recognition body that works to foster patient-centered care by improving collaboration and communication between primary and specialty care. Denver Health currently holds national recognition from the NCQA for its PCMH and strives to promote actions that support this movement.	Reimbursement regulations exist that lead to time constraints.
Many systems practice pre-consultation, so Denver Health can capitalize on this opportunity to participate in an avenue to contact peers and colleagues that creates advantages for patient and build interpersonal relationships.	Liability and patient responsibility concerns may hinder the use of pre-consultation.

Note: B. Neuhalfen and T. Freudig, personal communication, March 11, 2019

Appendix B

Willingness to Train Survey

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am ready and willing to train primary care and specialty care providers on pre-consultation option use	◯	◯	◯	◯	◯

Appendix C

Guideline for the Utilization of the Pre-consultation Communication Pathway

Why: The purpose of the pre-consultation communication pathway (PCCP) is to improve provider-to-provide communication by implementing a PCCP into EPIC. Previously primary-specialty provider communication occurred most frequently when a collegial relationship already existed. For those providers who did not have a previously established collegial relationship, they had difficulties contacting specialty care providers. This led to duplication in testing, inappropriate referrals, inefficiency, waste, and dissatisfaction. The PCCP creates a pathway for this communication for all providers that is later accessible in the patient chart.

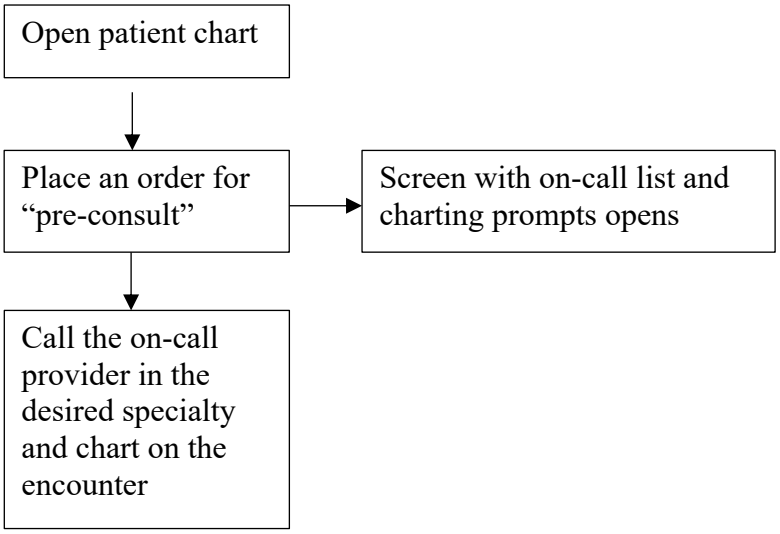
Who: Primary providers who wish to ask specialty providers quick clinical questions about patients prior to a decision to refer a patient.

What: Options for PCCP are a telephone call list or electronic messaging in EPIC with charting capability linked to individual patient charts.

When: The go-live date is set for January 29, 2020.

How: See figure below.

.



Appendix D

Institutional Review Board Request for Determination Form

COLORADO MESA UNIVERSITY

Sponsored Programs
1100 North Avenue • Grand Junction, CO 81501-3122
970.248.1424 (o) • 970.248.1812 (f) • 1.800.982.6372

INSTITUTIONAL REVIEW BOARD (IRB)
CMU Federalwide Assurance Number: 00024298

TO: Jordan Connelly

FROM: Cheryl K. Green, PhD
Director of Sponsored Programs

SUBJECT: IRB Determination of Human Subject Research

DATE: October 30, 2019

STUDY: Protocol 20-10: Pre-Consultation Platform Implementation QI Project

The Colorado Mesa University Institutional Review Board (IRB) also known as the Human Subjects Committee has reviewed your request for determination of human subject research and based on your answers, your project is deemed to not be research involving human subjects as defined by 45 CFR 46.102(e).

No further IRB review is necessary unless modifications to your project meets the definition of research involving human subjects as defined by federal regulations. Should you wish to conduct this type of research on this project in the future, then please submit an applicable IRB protocol application (i.e., Exempt, Expedited/Full) for IRB review and approval.

IRB Number: 20-10. This number is your protocol number and should be used on all correspondence with the IRB regarding this study.

Determination Date: October 30, 2019

If you have any questions, please feel free to contact me at irb@coloradomesa.edu.

Best wishes on your project.

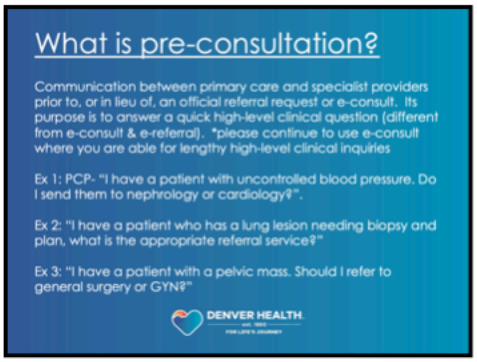
Appendix E

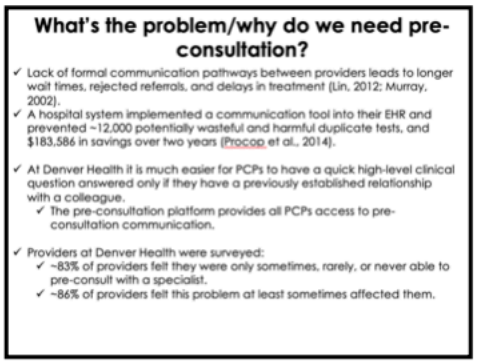
Goal Attainment Survey

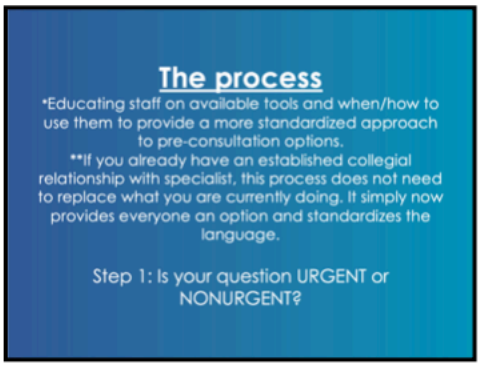
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The PF has helped me (the primary stakeholder) attain my goal.	◯	◯	◯	◯	◯

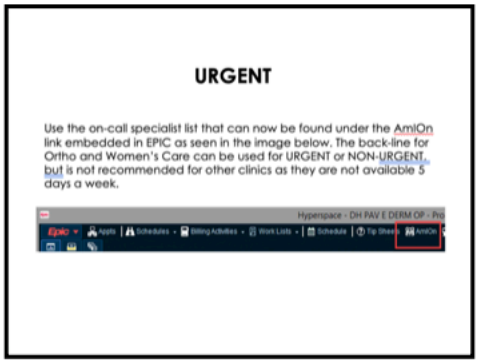
Appendix F

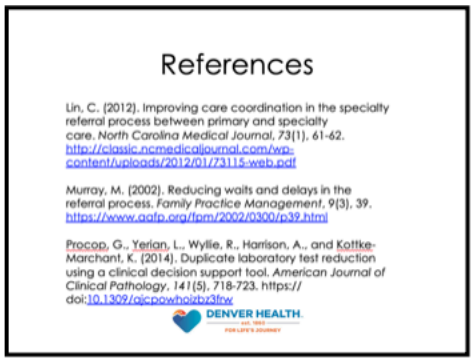
PowerPoint for PCCP Training











Appendix G

One-Pager for PCCP Training

DENVER HEALTH
est. 1860
FOR LIFE'S JOURNEY

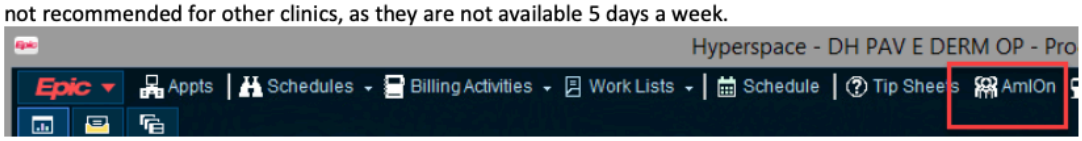
Pre-Consultation

What is pre-consultation? Quick and high-level communication between primary care and specialist providers prior to, or in lieu of, an official referral request or e-consult. Its purpose is to answer a quick clinical question about ADULT patients. Ex: PCP- "I have a patient with uncontrolled blood pressure. Do I send them to nephrology or cardiology?"; "I have a patient with an ankle injury, do I need to obtain an MRI prior to referring?" "I have a patient with a pelvic mass. Should I refer to general surgery or GYN?".

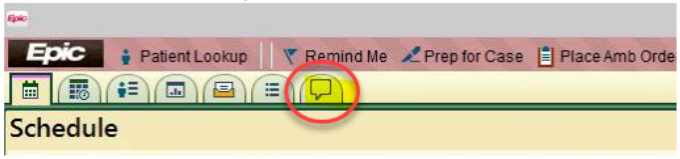
Why do we need pre-consultation? Lack of formal communication pathways between providers leads to longer wait times, rejected referrals, and delays in treatment (Lin, 2012; Murray, 2002). The purpose of this communication pathway is to promote standardized access to communication between providers despite presence of, or lack of, a previously established collegial relationship.

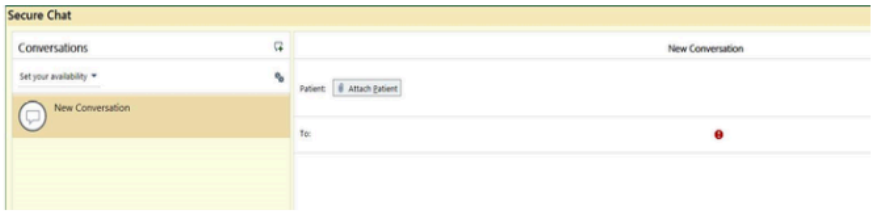
How do I pre-consult with a provider?
Is your pre-consultation question URGENT or NON-URGENT?

URGENT- Use the on-call specialist list that can now be found under the AmlOn link embedded in EPIC as seen in the image below. The back-line for Ortho and Women's Care can be used for URGENT or NON-URGENT, but is not recommended for other clinics, as they are not available 5 days a week.



NON-URGENT- Pre-consultation will largely occur in Secure Chat. See images below on how to access Secure Chat. Inquiry should be sent to the person listed on the on-call specialist list, and the attending should be used whenever possible. Responses are expected within 24-48 business hours. It is recommended that "PRECONSULTATION INQUIRY" be used as a header.





Lin, C. (2012). Improving care coordination in the specialty referral process between primary and specialty care. *North Carolina Medical Journal*, *73*(1), 61-62. http://classic.ncmedicaljournal.com/wp-content/uploads/2012/01/73115-web.pdf; Murray, M. (2002). Reducing waits and delays in the referral process. *Family Practice Management*, *9*(3), 39. https://www.aafp.org/fpm/2002/0300/p39.html

Appendix H

Email for PCCP Training

You may be seeing an increase in Secure Chat messages and correspondences using the terminology ‘pre-consultation’ or ‘pre-consult’. Pre-consultation is quick and high-level communication between primary care and specialist providers prior to, or in lieu of, an official referral request or e-consult. Its purpose is to answer a quick clinical question, for instance, “I have a patient with uncontrolled blood pressure. Do I send them to nephrology or cardiology?”. Please attempt to provide an answer within 24-48 hours. It has been suggested to providers to use “PRECONSULTATION INQUIRY” as a header, so you may see this come through. A quick 1-pager with more information is attached.

Appendix I

Pre-Consultation Between Services for Outpatient Patients Policy

PURPOSE

To establish guidelines for timely pre-consultation between providers at Denver Health and Hospital Authority (DHHA). This Clinical Care Guideline addresses quick high-level pre-consultation questions for specialists by primary care providers. This clinical care guideline does not address hospitalized patients, or patients in the Emergency Department (ED), or Pediatric Emergency Department and Urgent Care (PEDUC).

INCLUSION/EXCLUSION CRITERIA

A. Inclusion:
    a. Outpatient patients at DHHA
    b. Pre-consultations between healthcare providers
B. Exclusion:
    a. Pre-consultation on patients in the ED, PEDUC
    b. In-patients

SCOPE

All providers at DHHA.

DEFINITIONS

Pre-consultation: Quick and high-level communication between primary care and specialist providers prior to, or in lieu of, an official referral request or e-consult. Its purpose is to answer a quick clinical question.

GUIDELINE

A. Pre-consultation inquiry:
   Pre-consultation inquiries are initiated based on urgency.
    a. URGENT inquiry: The on-call specialist list embedded in Epic under 'AmIOn' will be used to contact the desired specialist. The back-line for Ortho and Women's Care can be used for URGENT or NONURGENT inquiries, but is not recommended for other clinics, as they are not available 5 days per week.
    b. NONURGENT inquiry: Pre-consultation will largely occur in Secure Chat. It is recommended for providers to include "PRECONSULTATION INQUIRY" in the header of their message. Responses are expected within 24-48 business hours.

Attachment A:
Consultation Expectations: Outpatient pre-consultation communication

REQUESTOR EXPECTATIONS

1. The requestor must be polite and respectful when interacting with the consulting service.
2. The requestor may utilize the on-call specialist list, Secure Chat, or the clinic back-line according to acuity and appropriateness.
3. The requestor will ensure the answer to their question is not already present in currently available referral guidelines.

PRE-CONSULTATION EXPECTATIONS

1. The consultant must be polite and respectful when interacting with the requesting service.
2. The consultant is expected to respond to Secure Chat messages within 24-48 hours.