Doctor of Nursing Practice Quality Improvement Project: Free Medical Clinic Diagnostic Testing Process Improvement

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Abstract

Title: Free Medical Clinic Diagnostic Testing Process Improvement

Background/Significance: Missed or delayed diagnostics can have an impact on a patient's care and can have medical-legal consequences for health organizations and personnel alike (Callen et al., 2012). Kwan et al. (2019) report that deficient laboratory testing processes can be attributed to safety concerns for patients. According to the National Association of Free & Charitable Clinics (2022c), in quality standard 4, section D, an audit measure identifies the need for tracking systems for diagnostic studies. Organizations, healthcare personnel, and patients can be negatively affected without a process for care coordination with diagnostic testing.

Methods: A literature search was conducted for articles published from 1986 to 2022 utilizing CINAHL, PubMed, and Google. After the literature review, articles had themes related to electronic medical records versus paper, standardization of processes, policies for diagnostic testing, and diagnostic testing processes. A valuable interventional guide was the Agency for Healthcare Quality and Research's *Improving Your Laboratory Testing Process* guideline that assisted with project design. Utilizing the Plan, Do, Study, Act model, a diagnostic testing process was designed and implemented for improved care coordination with diagnostic testing in a free clinic setting.

Conclusion: A lack of diagnostic testing processes can lead to negative outcomes for patients and healthcare personnel. Using a literature review and adaptations of a well-designed guideline, a proposed process was derived in the unique setting of a free clinic. With the successful implementation of a diagnostic testing process, measurements of staff satisfaction, review of documentation, and proper documentation placement will be conducted. After the successful implementation of the diagnostic testing process, a policy will be created.

Doctor of Nursing Practice Quality Improvement Project: Free Medical Clinic Diagnostic Testing Process Improvement

Inadequate care coordination as it relates to diagnostic imaging and laboratory work is problematic for patients and healthcare professionals. Missed or delayed diagnostics can impact a patient's care and have medical-legal consequences for health organizations and health personnel (Callen et al., 2012). The problem of care coordination associated with diagnostic imaging and laboratory work is compounded when clinicians who order, monitor, and follow up on the testing are offering their services in a free clinic setting on a voluntary, time-limited basis. This quality improvement (QI) project aims to implement a process at a free clinic to improve care coordination as it relates to diagnostic testing.

Background and Significance

In the political landscape of the United States, health insurance and access to care has long been a contentious issue impacting patients nationwide. Although the uninsured population decreased as a result of the Affordable Care Act (ACA), the issue persists. After the ACA implementation, the number of uninsured in America was approximately 10 percent (Mitchell & Shan, 2020). Although 10% may seem relatively small, the number of uninsured citizens is quite large. Tolbert et al. (2020) estimate that 28.9 million persons aged 0-64 were uninsured in 2019. During the coronavirus disease of 2019 pandemic, the concern of the uninsured in America was exacerbated. According to Anderson (2021), as a result of job losses related to the virus, approximately 5.4 million more Americans lost their insurance. In addition to the uninsured, undocumented immigrants add to the total uninsured population. Approximately 11 million undocumented persons reside in America, with approximately 53% or 5.8 million being uninsured (Migration Policy Institute, 2022). To further increase the uninsured population, refugees must be addressed; in 2021, 11,454 persons were granted asylum in the United States (Baugh, 2021). Refugees receive housing and health care support

for a period of one year after their arrival. (Centers for Disease Control and Prevention, 2022). As one might expect, refugees' access to health care is only a minor part of their challenges when migrating to a new country. With the uninsured, undocumented immigrants, and refugees, there is a need for an alternative healthcare delivery system that is supported by kind healthcare professionals across the nation through the operation of free clinics.

As uninsured, undocumented, and refugee persons residing in the United States lack traditional access to care through insurance, a substantial effort is undertaken by free clinics across the country. *Free clinics* are community-based entities that offer healthcare access to the uninsured or underinsured at little to no cost through volunteers (The Free Clinics, 2019). According to NAFCC (n.d.), free and charitable clinics are either free or provide a minimal charge if that fee is waived for essential services. Dependent on the clinic, free and charitable clinics may charge the uninsured or underinsured but at a greatly reduced rate. Federally Qualified Health Centers (FQHCs) are similar to free clinics serving the underserved and uninsured population but utilize a sliding scale method of payment and allow for the processing of care through private insurance (Centers for Medicare & Medicaid Services, 2022). Within the FQHCs system are programs catered to migrants, persons within the public housing system, homeless, and rural populations (Centers for Medicare & Medicaid Services, 2022, February). FHQCs serve the uninsured and underinsured but also process some form of payment for services, free clinics cater further towards the idea of free care for those in need.

Compared to the abundance of care settings for the insured in the United States, those underinsured or uninsured face reduced access to care. According to the National Association of Free & Charitable Clinics (NAFCC) (2022c), 1,400 free clinics and pharmacies across the nation serve approximately 1.8 million people annually. The number of persons treated at a free clinic is substantial but only represents approximately less than 10% of the uninsured population. Although not all-inclusive, at the state level in Michigan, at least 63 free clinics

are operating as of 2022 (Free Clinics of Michigan, 2023). According to Free Clinics of Michigan (FCOM) (n.d.), the free clinics are operated in 28 counties, with a majority of counties having one free clinic and higher populated urban regions with multiple free clinics. For instance, in the highly populated urban setting of Genesee County, where Flint, Michigan is located, there are five free clinics; within the metro Detroit, Michigan, Oakland and Macomb counties alone have a combined 10 free clinics serving vulnerable populations (Free Clinics of Michigan, n.d.). The majority of free clinics lie in higher populated, urban regions of Michigan.

Challenges are more prevalent for the uninsured in rural regions compared to those in urban regions. 13 metropolitan counties and 57 non-metropolitan counties of Michigan have qualified rural census tracts (Michigan Department of Health and Human Services, 2020). The rural setting in the state of Michigan is quite common, and the uninsured rate is high. According to the Centers for Medicare & Medicaid Services (2022), 13% of persons living in rural regions in the United States are uninsured. Along with rural settings Michigan now has 261 Health Professional Shortage Areas (HPSAs) for primary care, which makes the situation worse in this rural setting (HRSA, 2020). Shiawassee County, a rural setting, has one free clinic serving the rural population (Free Clinics of Michigan, n.d.). Within Shiawassee county, there is one FQHC further assisting in serving the rural population (Health Resources and Service Administration, n.d.). Free clinics focus primarily on episodic care but maintain a chronic care model for their respective returning patients with more complex health concerns. Complex presentations, such as a patient with shoulder pain or Diabetes Mellitus, require further coordination that may not be completed during a 30-minute session in a free clinic setting. This type of care coordination would require further follow-up with diagnostic testing.

Care coordination becomes a key concern for the patients and the free clinic staff when complicated cases are present. *Care coordination* is defined as "Deliberately organizing patient care activities and sharing information among all of the participants concerned with a patient's care to achieve safer and more effective care" (Agency for Healthcare Research and Quality, 2018a, para 1). More specifically, applying care coordination to this project; care coordination is the ordering of, tracking of, documentation of, and communication of diagnostic studies between the patients, health professionals, and the charting system. According to the Agency for Healthcare Research and Quality (2018), a well-made, focused care coordination plan can improve outcomes for all involved, including providers. Sometimes in a free clinic setting, a patient with shoulder pain or Diabetes Mellitus may be required to receive further diagnostic testing to treat their ailment. In a rural mid-eastern Michigan free clinic setting, these patients must obtain their diagnostic testing in another setting; the testing site must process and relay the results, then the provider must review the results and communicate them to the patient and other health professionals within the free clinic. The process is compounded as the voluntary staff at the clinic have alternative responsibilities after the clinic that they must focus on. Calen et al. (2012) point out that the amount and time involved with follow-up places a burden on physicians. Within the free clinic site, multiple communication pathways exist without a process inefficiency with care coordination can occur. Complexity with care coordination is intensified by the immense variations of forms of diagnostic testing.

To further understand the complexity of challenges with care coordination, specifically with diagnostic testing, diagnostic testing needs clarification. *Diagnostic testing* can be divided into laboratory testing and diagnostic imaging studies. Laboratory testing includes blood panels, general laboratory testing, respiratory specimens, genital specimens, stool specimens, urine specimens, and other tests such as an aerobic culture (see Appendix B

for laboratory testing details). Whereas diagnostic imaging includes X-rays, computerized tomography scans (CT), magnetic resonance imaging (MRI), and other imaging studies (see Appendix C for further diagnostic imaging details). NAFCC (2022c) reports that 79% of the association's clinics offer onsite laboratory services. The ability to conduct onsite laboratory services improves care coordination for diagnostic studies and concordantly reduces costs for those free clinics. The project site does not have onsite diagnostic testing available but adjacently located, a rural, small community hospital offers diagnostic testing to the project site at a reasonable rate. The nation's foremost association for free clinics, the NAFCC (2022b), provides quality standards to quantify and qualify care received in their association member's free clinics.

Free clinics within the NAFCC must attest to implementing various standards in their practices and may have organization audits conducted (NAFCC, 2022c). The NAFCC provides quality standards related to care coordination as one of the many emphases it considers. According to the NAFCC (2022c), in quality standard 4, section D, an audit measure identifies the need for tracking systems for diagnostic studies. The NAFCC recognizes that safe and effective care is improved if a free clinic utilizes a tracking system. The NAFCC (2022c) advises a clinic should have policies for patients who miss appointments or require follow-up on diagnostic testing results covered by the clinic/pharmacy's policies, procedures, and tracking system. The clinical significance implicated by this quality care measure guides free clinics within the association to place a priority on developing and utilizing a policy, procedure, or process related to care coordination with diagnostic testing.

Problem Statement

Care coordination with diagnostic testing becomes complex when two separate healthcare teams must-cohesively analyze and communicate test results. In a rural Michigan

free clinic, care coordination complexities for diagnostic testing are heightened due to limited operational days and the absence of defined roles, leading to delays in test result communication and adversely affecting patient outcomes. On average, the clinic must coordinate care for diagnostic testing for 30% of the patients they see during clinic sessions. When diagnostic test results are not communicated to the free clinic, and there are delays in reporting the results to the patient, consequently, outcomes for the care-seeking individual can be negatively affected. The care coordination problem is further compounded as results are typically reported during non-clinic hours, and defined roles and responsibilities are not established for staff to coordinate care. These various challenges create a significant need to implement a process established on quality improvement to develop care coordination for diagnostic testing at the free clinic. The project aims to implement a QI process to enhance care coordination with diagnostic testing.

Project Site and Population

The Shiawassee Free Medical Clinic is a volunteer-based, non-profit primary care clinic focused on serving the uninsured (Shiawassee Free Medical Clinic-For the Uninsured, n.d.). The organization cares for patients in either an episodic or primary care format. The clinic operates on the first and third Saturdays from 0700-1030 with scheduled visits and walk-in availability for the respective patients (Shiawassee Free Medical Clinic-For the Uninsured, n.d.). From observation, the number of patients seen varies but anywhere from 15-25 patients attend clinic sessions. As the name may infer, the free clinic does not charge the patients it serves, only serving the uninsured with no billing of Medicaid, Medicare, or any private insurance (Shiawassee Free Medical Clinic-For the Uninsured, n.d.).

The healthcare team consists of two medical doctors, two registered nurses (RN), and two clerks, with a majority of the staff offering their professional health skills on a voluntary

basis. Along with the central staff, there are various intermittent health professionals offering their services intermittently to the clinic. Essentially there are two teams, one provider and one RN, to care for the patients attending the clinic. One RN provides intermittent administrative and clinical services for an hourly rate during the week, and the two clerks are paid hourly for their services during the clinic.

According to Shiawassee Free Medical Clinic-For the Uninsured (n.d.), patients can receive care at the free clinic in Shiawassee County, Michigan, and surrounding counties. Surrounding counties include Genesee, Saginaw, Clinton, Ingham, Livingston, and Gratiot counties (Library of Michigan, 2018). In 2020, the United States Census Bureau conducted a Small Area Health Insurance Estimates survey displaying uninsured rates in the surrounding counties; Shiawassee County had an estimated 2,922 uninsured persons, and all other surrounding counties mentioned had a combined estimated 34,308 uninsured persons (United States Census Bureau, 2020). The clinic setting is in a rural mid-eastern Michigan setting.

An integral part of understanding a clinic's population is understanding its consumers. Unfortunately, the paper charting system the free clinic functions with creates a tremendous time barrier to obtaining demographic information for all patients. From a broader context, 13% of persons living in rural regions in the United States are uninsured (Centers for Medicare & Medicaid Services, 2022, February). The clinic setting is considered a rural region, and the population faces additional challenges. According to MDHHS (2020), rural Michiganders face limited public transportation options. In Shiawassee County, educational attainment estimates of the high school level are estimated at 35.1%, and some college, no degree at 25.6%, making up the largest two percentages of educational attainment (United States Census Bureau, 2021). Of the estimated 784 foreign-born population in Shiawassee

County, 55.9% are not U.S. citizens (United States Census Bureau, 2021). As related to occupation for those of the labor force 16 years of age and older, the highest percentage of the industry is manufacturing with 22.6%, followed second by the educational services, healthcare, and social assistance sector with 22.2%, the unemployment rate in the county is 6.8% (United States Census Bureau, 2021). A brief statistical presentation provides a view into the population served at the clinic site, which is uninsured rural Michiganders.

Organizational Assessment of Project Site

This QI project took place in a rural mid-eastern setting in a clinic that offers medical care to the uninsured in Shiawassee County, Michigan. In order to fully realize the strengths, weaknesses, opportunities, and threats (SWOT) to the project site, onsite observation and communication with stakeholders were conducted (see Appendix A for SWOT analysis). SWOT analysis aims to offer organizations an understandable guide to internal and external factors that can cease and facilitate a plan (Minnesota Department of Health, n.d.). Consideration of SWOT is critical to understanding a multitude of factors that affect the implementation of a process for care coordination associated with diagnostic testing.

Organizational Strengths

One unique relational strength of the Shiawassee Free Clinic is its partnership with Memorial Hospital, a small rural community hospital. The hospital offers healthcare office space rental at a greatly reduced rate during free clinic operations, a specialty service utilizes the space during the week. Although diagnostic testing is not done directly in the office, the free clinic is adjacent to the rural hospital where diagnostic testing is conducted. Another strength is that stakeholders identify care coordination with diagnostic testing as a significant priority. The acute care hospital is offering regular lab testing at $10.00 per test, radiology plain film exams at $15.00 per test, and all other diagnostic tests at Medicaid reimbursement rates for patients attending the free clinic. The free clinic has discretionary spending obtained

through grants and donations that pay for the patient's ordered diagnostic testing and health-related care needed outside of the clinic. Stakeholders also report stewardship of funding, services free of charge, and decades of service in the community as strengths. Another important strength is the eagerness of the clinic for quality improvement.

Organizational Weaknesses

Overall, a general lack of policies and procedures with an ill-defined mission statement is an observed weakness. A clinic strength is the length of time in operation, but stakeholders also identified a lack of leadership hierarchy as a weakness even with decades of operation. Stakeholders also identified care concerns such as a lack of social services, minimal preventative health services offered, and inefficient care coordination related to diagnostic testing and referral to specialty care. Another overarching weakness is the charting system, currently in paper form, creating inefficiencies in charting and measurement of statistics for care and demographics of the population.

Organizational Opportunities

Opportunities to improve the Shiawassee Free Clinic align with the organizational weaknesses, and perhaps the most valuable opportunity is the continued and greater strengthening of the relationship with Memorial Health in Owosso, Michigan. This opportunity could assist with care coordination with diagnostic testing but further, evolve with referrals to specialists in the future. Just as a lack of policies and procedures was identified as a weakness, it is also an opportunity undertaken by this QI project, specifically with care coordination related to diagnostic testing. NAFCC (2022c) requires members to have policies for diagnostic testing. A major opportunity that aligns with a majority of weaknesses would be the implementation of an electronic health record which could allow for improved care coordination with many measurements of care, including diagnostic testing.

Organizational Threats

The greatest threat to the free clinic is the loss of the volunteers who currently offer their professional health services to the community free of charge twice per month. The current core voluntary staff have offered their services for decades, and without an influx of new staff, the free clinic could shutter. A secondary, similarly large threat is the relational loss of Memorial Hospital, a small rural community hospital. Michigan resides in the top ten states across the nation, with the highest risk of rural hospital closures (Mosley & DeBehnke, 2019). These two identified threats are not only detrimental to the QI project but also to the clinic's sustainability.

Purpose of Project

The purpose of this quality improvement (QI) project is to improve safe and effective care through the development of a care coordination process with diagnostic testing in a rural mid-eastern Michigan free clinic**.** The Agency for Healthcare Research and Quality (AHRQ), a federal government organization, guides healthcare systems in developing practice and process changes to enhance safe, quality care for patients (AHRQ, 2018). Care coordination is directly involved with improving the quality of care delivered. According to AHRQ (2018), an explicit example of care coordination is monitoring and follow-up, which is critical in diagnostic testing. The project study's aim of implementing a process will assist the free clinic in providing safe and effective care by creating an overarching guide and policy for all healthcare professionals who operate in this outpatient setting.

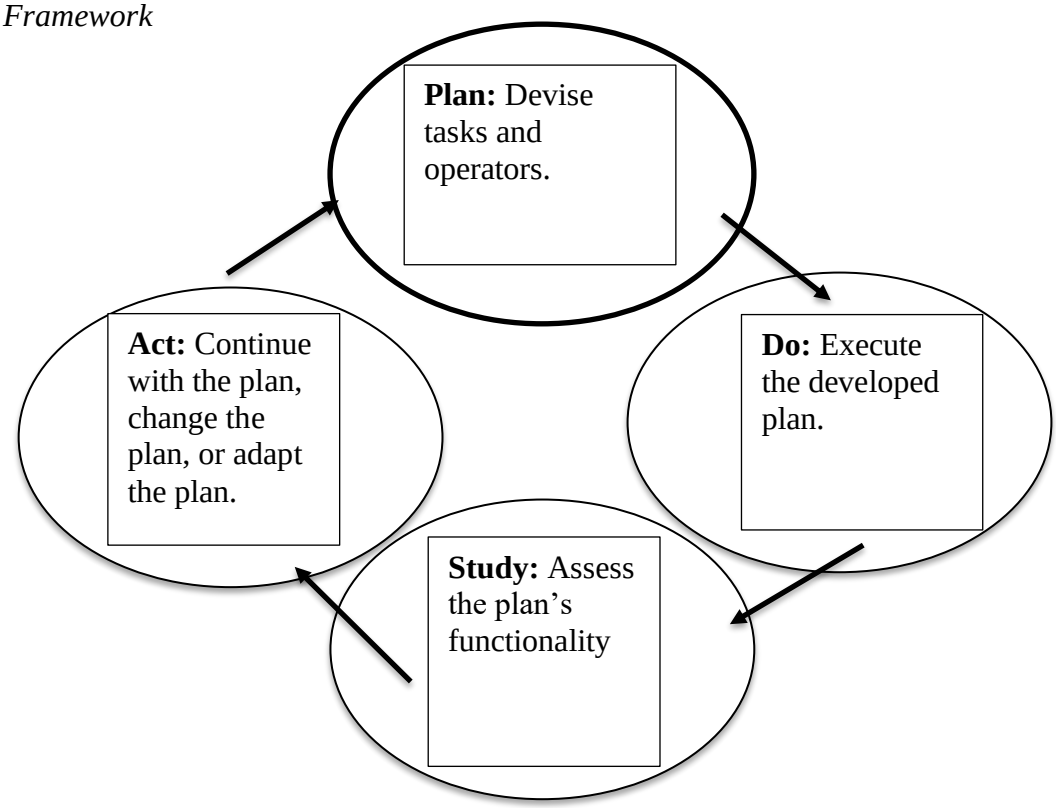
Quality Improvement Model

According to the Centers for Medicaid & Medicare (2021), quality improvement is the structure to improve care in a consistent manner. Structure and consistency to resolve

healthcare-related problems are needed with quality improvement to adequately address all contributing factors to a specific problem. Quality improvement aims to homogenize methods and provide frameworks that decrease deviation, achieve uniform outcomes, and improve patient outcomes (Centers for Medicaid & Medicare, 2021). The Plan Do Study Act (PDSA) cyclical framework is a widely utilized four-step model for process improvement (Christoff, 2018). The initial step is *plan* creation, in which the goal is to find a process related to the problem to implement at the free clinic in mid-eastern rural Michigan (Christoff, 2018). The second step of the PDSA model is *Do,* which is the implementation of the plan, collection, and recording of data, and ensuring understanding of the positives and negatives of the plan (Christoff, 2018). During this phase, the implementor has the opportunity to observe inefficiencies and defects in the overall plan, an opportunity to observe flaws in the original plan. The third phase, *Study*, provides the implementor an opportunity to evaluate the data collected while comparing it to the results expected during the planning phase (Christoff, 2018). The *S*tudy phase can be thought of as a reflection, a judgment on whether the plan is working accordingly. The final step, the *Act* step, is when the implementor takes a portion of the *Study* phase utilizing the data to decide whether to implement, change, or discard the plan (Christoff, 2018). The PDSA model is widely utilized because of the model's ability to change the original plan if observed deficits are seen during the clinical application of a proposed idea.

Figure 1

PDSA Framework



(Christoff, 2018)

Review of the Literature

A comprehensive review of the literature was completed to identify a process for improved care coordination with diagnostic testing. The literature review consisted of the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and Google. A university librarian assisted with search terms and search databases as articles related to the project were difficult to obtain. Additional articles were selected from references in articles identified from the database searches. The primary search terms used to determine the most relevant articles were (Diagnostic study AND coordination) in CINAHL and Diagnostic AND test* AND uninsur* OR underinsur* OR "no insurance OR "free clinic" in PubMed, and care coordination AND diagnostic testing AND free clinic in google. Inclusion criteria consisted of articles in the English language addressing a standardized process for care coordination involving diagnostic testing in primary care, free clinic, or ambulatory care setting in patients 18 years of age or older and publications from 1986-2021. Inclusion

criteria of 5 years old or newer were applied to PubMed literature search. Additionally, priority was given to studies and articles from the United States. However, one article was maintained from another country since the methodology was robust and added to the understanding of the problem.

The search identified in the following databases, CINAHL (33), PubMed (746), and Google, found more than 5,000 potential articles. A review of titles and abstracts eliminated nearly all of the articles on CINAHL and PubMed, with some utilized for information related to background and significance. Google was the most useful search database, with one systematic review of qualitative studies, four qualitative reviews, one descriptive study, one expert opinion study, and one diagnostic process implementation guideline (see Appendix E for synthesis table). Further dissemination and themes are discussed below for application at the project site (see Appendix F for literature review table).

Synthesis of the Evidence

After conducting a thorough literature review, a synthesis of the evidence examined a plethora of systematic reviews, qualitative reviews, practice guidelines, and expert opinion articles which guided the implementation of a process for diagnostic testing in the free clinic setting. Articles applied to the project were briefly disseminated in a literature review table to identify the level of evidence, study description/aim, data source, sample, measurements, and strengths/weaknesses/implications of various studies (see Appendix F). The level of evidence was derived utilizing Ackley et al., (2008) level of evidence hierarchy (see Appendix G). For a more thorough understanding and dissemination of literature, an intervention table was created to further divulge themes learned from evidence (see Appendix E). The primary themes obtained from the literature review were considerations between electronic medical

record (EMR) versus paper, standardization of the diagnostic testing process, policies for the diagnostic testing process, and stages of the diagnostic testing process.

Electronic medical record versus paper

The project site currently utilizes a paper charting system for their care records, four articles discussed the diagnostic testing process when using an electronic medical record (EMR) versus a paper charting system. Elder et al. (2010) found that EMR documentation management steps were documented more than paper charting when comparing the two forms of charting. Compared to paper charting, which does not alert a provider, EMRs have the ability to provide electronic alerts to ordering providers of abnormal results. A diagnostic imaging alert system intended to be protection relaying abnormal results to two providers but actually was correlated with untimely follow-up (Singh et al., 2009). Having multiple persons sign off on an alert appears to create a disconnect on which clinician is responsible for the follow-up. According to Callen et al. (2012), physicians can acknowledge an alert but not act on the alert in an EMR. A positive aspect of having an EMR lies in safety. According to Elder et al. (2009), the appropriate implementation of technology is critical in high-quality test results management. Overall, using an EMR should assist with care coordination related to diagnostic testing. Unfortunately, having an EMR may decrease the quality of the diagnostic testing process if not appropriately constructed (Hickner et al., 2008). The causation of deficiencies in care coordination associated with diagnostic testing comes down to processes more than the presence or absence of an EMR.

Standardization of processes

A repetitive theme within five articles was the need for standardized processes for diagnostic testing. An overarching theme is a need to identify policies and procedures that

will, in turn, improve the safety and quality of patients served (Callen et al., 2012; Elder et al., 2010). Kwan et al. (2019) report that deficient laboratory testing processes can be attributed to safety concerns for patients. Diagnostic testing used in patient care is intended to reduce harm, not increase it. Although standardization of testing processes aids safety and quality, Hickner et al. (2008) found errors will occur nevertheless with refined testing process management. Elder et al. (2010) found that no office performed results management steps uniformly during a study of eight different practices. Elder et al., (2009) found the absence of standardization with patient notification alarming. A combination of an efficient process and policy should improve care coordination relating to the diagnostic testing process.

Policies for Diagnostic testing processes

A minor theme in the literature review discussed policies related to care coordination with diagnostic testing; although minor in literature, it is significant in the continued management of diagnostic testing in practice. To aid in the resolution of process errors for abnormal tests, Singh et al. (2009) suggest every facility develop policies for the responsibility of relaying results. Later works by Singh et al. (2010) advise eight policy suggestions to standardize diagnostic testing. Although the literature did not focus heavily on policies, after a process is implemented, a policy can be formed for the sustainability of the process for care coordination with diagnostic testing.

Process Stages

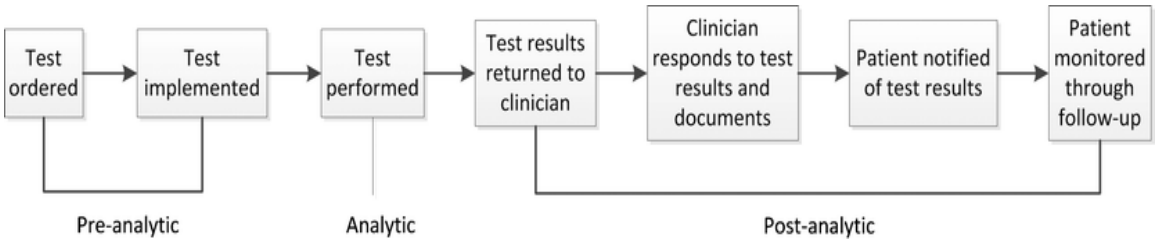
Care coordination with the diagnostic testing process becomes cumbersome as multiple phases occur. Diagnostic testing is theoretically separated into pre-analytic, analytic, and post-analytic stages (Hickner et al., 2008). With the multiple steps needed once a test is ordered, errors can possibly occur at multiple facets of the process. Hickner et al. (2008)

described that approximately one-third of problems happen during the pre-analytic to analytic phase, and just under 50 percent occur during the post-analytic phase (see Figure 2).

During the post-analytic phase (see Figure 2), Elder et al. (2010) found that clinics utilizing a paper charting system had 100% of the results in the correct area of the chart, 86% had a provider's signature on the results, 64% had provider's analysis, and only 66% notated communications with patients. Within the post-analytic nexus, Singh et al. (2009) identified deficient acknowledgment of and deficient timeliness in communicating abnormal diagnostic tests to patients. Callen et al. (2012) recognized that clear processes for follow-up are needed and continued informing that documentation during the post-analytic phase was correlated with the conveyance of appropriate care. A theme missing during the literature review was the pre-analytic and analytic phases. Consideration should be given that a provider is educated enough to order the appropriate testing, and the laboratory setting should be able to perform the appropriate test advised by the provider.

Figure 2

Testing Process Phases



(Hickner et al., 2008)

Goals and Expected Outcomes

The goal of this project is to improve the process for care coordination related to diagnostic testing through care coordination standardization. The objective is to implement a process for uniformity in care coordination with diagnostic testing through a review of the

literature to find a systematic way to improve care coordination with diagnostic testing. A rising amount of evidence demonstrates that when clinical treatment patterns are widely different, clinical results are negatively impacted and safety may be jeopardized (Rozich et al., 2004). The outcome is to implement a diagnostic testing process and obtain 80% staff satisfaction with the process implementation, 80% proper documentation of results, and 80% placement into the chart of documentation of results.

Methods

Current State of Diagnostic Testing Process

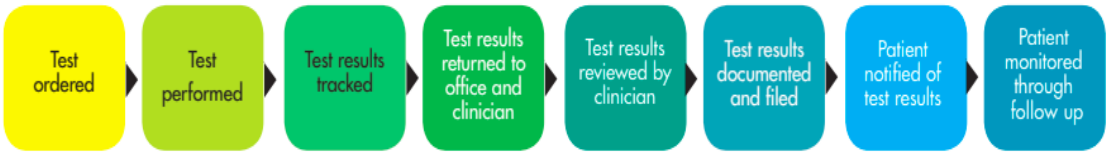
In the current state for care coordination relating to diagnostic testing, there is no standardized process or policy to guide providers or volunteer staff on the management of diagnostic test results. During observation prior to the implementation of the new process, one RN at the free clinic informed that when a provider places an order for diagnostic testing, a copy of the order form is placed into the chart, and the patient is educated prior to leaving the location to have their diagnostic test completed. The main stakeholder, a retired provider, informed that he reviews each result with the patient, mainly by phone, during the week after the results are received. This process meets the NAFCC (2022b) quality standard 4D, which requires the review of abnormal and normal diagnostic test results. The secondary provider at the free clinic utilizes a different method. During discussions, the secondary provider reported that if diagnostic tests are ordered, the patient is scheduled to come back 14 days later at the next free clinic session, and results are reviewed during the appointment. Although not ideal, within the setting, it is a justifiable time frame. Implementation of a uniform care coordination process with diagnostic testing will require specific interventions.

Intervention Design Overview

Although not reviewed during the literature synthesis, a critical guideline obtained during the literature review was the AHRQ's *Improving your Laboratory Testing Process* toolkit, which assists users in increasing diagnostic testing process reliability (Agency for Healthcare Research & Quality, 2018). A team implemented and reviewed the processes within the AHRQ toolkit and found the tool easy to use to improve their processes with care coordination and diagnostic testing (Kwan et al., 2019). This public domain toolkit provided by the AHRQ allows users to adapt its use, which will benefit the project site setting (Agency for Healthcare Research and Quality, 2018). Figure 3 provides a breakdown of steps that need to be addressed during the diagnostic testing process (Agency for Healthcare Research & Quality, 2018). As the free clinic project site is operating with paper charting, volunteers, and limited hours of availability, adaptations will be necessary. The 4 steps for the diagnostic testing process intervention will be further explained for clarity of actions needed to obtain the outcomes desired.

Figure 3

Testing Process Steps



(Agency for Healthcare Research & Quality, 2018b).

Step 1: Test Order Tracking

Callen et al. (2012) bring forth that clerical staff can assist in follow-up as their study was directed more toward follow-up. In the project site setting their efforts will be utilized to their full potential. During the clinic, the clerk will obtain the number of tests ordered during

that day, the number of order forms placed into the patient's chart, and the number of order forms needing to be obtained the following clinic and complete the project sheet, step 1 (see Appendix H). All associated orders and completed project sheet step 1 will be placed into a management folder labeled step *1*. All actions of test tracking are correlated with Hickner et al. (2008) pre-analytic phase (see Figure 2).

Step 2: Test Results Tracking

Hickner et al. (2008) found that approximately 7% of requested tests were not completed by the patient out of 966 tests ordered. As it relates to the diagnostic testing process this is the first phase where exterior challenges can present. To reduce the number of test results not obtained, a two-step process is needed in this phase. In this two-step process, step 2 reconciles the ordered diagnostic tests, and step 2.5 reconciles test results that were not received.

In step 2, the clerk completes project sheet step 2 (see Appendix I), which correlates the previously ordered tests and requires the clerk to obtain the number of results received. The clinic site has an implemented process with the diagnostic testing center to have results faxed to the office during non-clinic hours. When results require the immediate attention of the providers in the free clinic, the diagnostic testing center has a policy with critical lab values that require an immediate alert to the ordering provider, who is contacted by telephone expeditiously. Step 2.5 and coinciding project sheet 2.5 (see Appendix J) provide processes for diagnostic test results not received by the clinic.

In step 2.5 diagnostic test results not received by the free clinic are addressed. The challenge that is expected to present during this process is requisite testing was not completed at the lab by the patient. As an intervention to address patients who have not conducted the

ordered diagnostic testing, a phone contact will be made and notated into the patient's paper chart on the clinic day if it is found the testing has not been conducted. This step provides a reminder to the patient and a second notification to the patient from the office staff to have the ordered testing conducted.

Actions taken in steps 2 and 2.5 will ensure that Hickner et al. (2008) analytic phase is completed and the patient conducted the requisite test. These actions coincide with a portion of the NAFCC (2022b) quality standard 4D, which requires free clinic offices to monitor diagnostic testing until results are obtained and further coordination with overdue results. As step 2 is completed, project sheets 2 and 2.5 will be placed into a folder labeled Step 2 and Step 2.5 and filed accordingly. Actions completed during steps 2 and 2.5 will lead into the post-analytic phase of the diagnostic testing process, which involves monitoring steps.

Step 3: Provider Receives Results

After completion of steps 2 and 2.5, providers will be able to receive patient results to disseminate the findings as the test results have been obtained and the clerk has given the results to the providers. After discussion with the primary stakeholder, it was determined that during the clinic in which the test results are received in the office, the providers will contact the patient via phone to inform the patients of their results. Singh et al (2010) discuss how many test results require replies by the provider in a one to two-week time frame, but in the free clinic setting, this may be an unattainable goal. The provider will review the results once received at the following clinic. During this step in the developed diagnostic testing process, the Agency for Healthcare Quality & Research (2018b) step of returning results for the provider review is addressed (see Figure 3).

Step 4: Test Results Reviewed

With each provider's education and clinical experience, results can be reviewed independently, but documentation needs monitoring for assurances of uniformity of the newly designed diagnostic testing process. The NAFFC (2022c) requires documentation of the diagnostic testing results of when and by what means the patient was notified of the results. The most important items for review of diagnostic testing results after the provider communicates with the patient is the documentation. To aid in the standardization of this portion of the process, the clerk will complete the project sheet step 4 (see Appendix K). After completing the review, the clerk will place the documented diagnostic testing results into the patient's chart and finalize the diagnostic testing process. This step in the diagnostic testing process of review of the documentation and filing ends the correlation to the AHRQ's (2018b) lab testing process in Figure 3, as monitoring through follow-up will not be attended to in this process. Rather, a future study focused on follow-up to specialty care after diagnostic testing is suggested.

Outcome Measures

After educating and discussing the devised diagnostic testing process with staff at the project site and implementing the interventions, outcome measures will be assessed. As discussed briefly in the goals and expected outcome section, measurable data for implementation of the diagnostic testing process will entail obtaining 80% staff satisfaction with the process implementation, 80% proper documentation of results, and 80% placement into the chart of documentation of results.

In order to assess staff satisfaction post-implementation, an anonymous survey was created assessing staff opinions on comfortability, sustainability, opportunity to provide input

into processes, opinion of impact on patient population, and process satisfaction. The most pertinent question, question five (see Appendix N), will be utilized to obtain 80% staff satisfaction with the diagnostic testing process. To quantify question number five, a customer satisfaction score (CSAT) will be used. This frequently deployed measurement is used to assess customer satisfaction (Qualtrics, 2022). The CSAT score is an applicable measure as the staff can be considered a customer of the newly designed diagnostic testing process. To obtain the goal of 80% proper documentation and 80% placement of results into the chart, the project author will review all project sheets in step 4 (see Appendix K) collected during the project and calculate compared to the total number of tests ordered during the project.

Before implementing the designed process, an anonymous pre-process survey (see Appendix M) was completed by the eight staff members in hopes of obtaining opinions before implementing the process. Survey responses found that 63.5% of staff are satisfied with the diagnostic testing process, 63.5% feel every diagnostic testing result is placed in patients' charts, and 12.5% feel that every diagnostic testing result has documentation of how and when the results were communicated. Admittedly the pre-process survey are opinions rather than actual data reviewed prior to process implementation.

Ethical Considerations

Michigan State University Internal Review Board (IRB) exempt status was obtained prior to beginning implementation of the QI project. Office staff involved in the project remained anonymous on all surveys and data collection. The newly designed diagnostic testing process was discussed, and questions were answered with the author present at a meeting prior to implementation. The project author was present at all clinics to assist and

answer any questions needed. Any anonymous survey copies will be stored in a locked drawer at the DNP student's private home office.

Timeline and Budget

The implementation of the QI project will begin on the first Saturday of January, January sixth, 2024, when the initial diagnostic testing process will be implemented and monitored by the project author and staff at the clinic site. Throughout the project, the PDSA cycle will allow for evaluation to observe if the plan is working and can be adjusted if necessary (Christoff, 2018). To further create conformation with the designed diagnostic testing process, the project author will be present at all clinic sessions and continually communicate with stakeholders and participants. For further clarification, a Gannt chart was created (see Appendix O) for visualization of the project timeline.

As the majority of staff work in the project site on a voluntary basis, the budget for the designed process was essentially null. Clerk responsibilities relating to the project are substantial actions, but estimated costs are one to two hours per week. Simple office supplies such as pens, paper, and printing have an estimated cost of $50 dollars which will be supplied by the clinic at no cost. Personnel time from the project author will be for hours attributed to DNP studies. Appendix P provides a visual representation of budgetary concerns.

Analysis

During the six clinic sessions that the project was implemented, 90 patients were seen, out of which 27 required diagnostic testing. This indicates approximately 30% of all patients attending the clinic required some form of diagnostic testing. Essentially 1 in 3 persons required continued care coordination with diagnostic testing. Among these 27 diagnostic tests, 7 were imaging diagnostics, constituting roughly 25% of the diagnostic tests. One biopsy comprised a marginal percentage, with the remainder, approximately 70%, being

formulations of blood testing. The majority of testing conducted during clinic sessions were blood tests, which are less tedious for follow-up. As expected, care coordination with diagnostic testing did not always flow smoothly from the pre-analytic to the post-analytic phase.

Challenges arose during the analytic phase of testing. Notably, during step 2.5 of the diagnostic testing process, reconciling missing tests became a significant concern. It was noted that roughly 18% of tests, equivalent to five tests, lacked results that were received by the clinic, necessitating additional tracking efforts. This aspect of the process proved cumbersome, as clinic staff had to reach out to the diagnostic testing center via phone to confirm whether the patient had undergone testing. Subsequently, further phone calls were needed to remind patients to conduct their diagnostic testing. Throughout the implementation phase, three patients required reminder phone calls to finish their diagnostic tests, one report was not transmitted by the diagnostic testing center, and one diagnostic imaging test result was awaiting the completion of a written report when the project finished. With the redundancy involved in project design, the QI project achieved 26/27, or approximately 96%, proper documentation of diagnostic test results and proper placement into the chart.

As previously discussed, an anonymous pre-process survey was conducted, indicating that 63.5% of staff were satisfied with the diagnostic testing process in place before project implementation. The overall satisfaction with the diagnostic testing process was identified as a critical measure of implementation success. Following the implementation, an anonymous post-process survey to five staff demonstrated a substantial improvement in satisfaction, with 96% expressing satisfaction with the implemented diagnostic testing process. Moreover, the post-process survey revealed that 96% of respondents believed that the implemented process positively impacted the patient population, 88% felt comfortable and empowered to provide input into the diagnostic testing process, and 92% observed the diagnostic testing process

functioning effectively in practice. By acknowledging and addressing the identified challenges while incorporating staff feedback, the implementation of the diagnostic testing process not only heightened overall satisfaction but also streamlined the efficiency and effectiveness of diagnostic testing within the clinic.

While the diagnostic testing process was effectively implemented, one of the original aims remained unattainable. The initial aim was for the successful implementation of the diagnostic testing process to spur policy development within the free clinic. However, this goal was not realized, as the clinic continued to refine its diagnostic testing process even after the PDSA cycles concluded. For further information on PDSA cycles see Appendix Two new clerks were hired during the final week of implementation who both had access to the rural hospital's diagnostic testing site electronic health record. This change significantly facilitated access to all diagnostic testing results, inevitably impacting the current diagnostic testing process. Although the process operated smoothly within its specific context, it's worth noting that both the sample size and duration of the project implementation were relatively modest.

Sustainability

Sustainability was a major focus for the design and implementation of this QI project, as care coordination with diagnostic testing was insufficient in practice. The stakeholders did identify that a process for diagnostic testing was needed, and while conducting the project, it appeared that their collective focus was on the diagnostic testing process. The main stakeholder, a provider, assisted in garnering another provider's interest in the project during its implementation, further advancing the project's sustainability. Kwan et al. 2019, discuss how deficient standardized diagnostic testing processes are a core contributor to patient safety concerns. As discussed throughout this project and literature review, standardization is beneficial when implementing care coordination with diagnostic testing. As originally

designed with the primary stakeholder, in step 3, providers were going to contact the patient by phone the following week when diagnostic tests were received to discuss results. During week one of implementation the provider approached the project author and requested no changes occur with provider practices. During the fourth week of implementation, the main stakeholder, after finding a missed critical diagnostic study, collaborated with another provider and implemented a new practice. From the fourth PDSA cycle forward, all patients who had diagnostic testing ordered were required to attend the following clinic to discuss their results face to face. For sustainability, provider buy-in was crucial for the success of the continued management of care coordination with diagnostic testing.

As for the longer-term sustainability of the overall functionality of the Shiawassee Free Medical Clinic, the aging staff and voluntary status of many healthcare professionals are a threat to sustainment. A prime example occurred on the last day of the project implementation when the clerk who had been essentially guiding the entire project quit. During the last clinic of the project implementation, one clerk quit, and one clerk called in sick, leaving the staff short-handed. To further compound this problem with two missing clerks, the main stakeholder hired two new clerks to replace the ones who were missing, and they were subsequently trained during the clinic session. The fragility of the free clinic was visualized during the last clinic. The most immediate threat to long-term sustainability is the loss of the staff who volunteer and those who are paid.

Discussion/Implications for Nursing/limitations

Overall, this project placed care coordination with diagnostic testing at the forefront of each provider, clerk, and nurse's mind within the clinic. In this QI project, 18% of tests needed further follow-up, aligning with Singh et al. (2009) findings that 18.1% of their

tracked tests lacked documented follow-up thus needing further follow-up. The most telling and greatest justification for the purpose of the project came during the fourth PDSA cycle. The main stakeholder, a provider, approached the project coordinator to alert them to a delayed testing result. Prior to project implementation, a CT lung cancer screen was ordered on December 2, 2023, with the scan subsequently conducted revealing a nodule on the patient's thyroid. The problem occurred in this process within the post-analytic phase of the testing process, as the provider was not aware of the results until approximately one to two months later. After discovering this thyroid nodule on the report, the provider ordered an ultrasound on February 16, 2024, and a biopsy of the thyroid nodule on March 16, 2024. Callen et al. (2011) found that 1%-11% of patients' providers failed to review test results with persons with a suspected malignancy. Although this was a smaller sample size the percentages aligned. This is only one patient and one example; it provides a direct example of the need for a process for diagnostic testing.

Implications for nursing can also be derived from the example of delayed care the patient with the thyroid nodule received. Admittedly, the project sample size was small, but it aligned with Callen et al. (2011) systematic review's failure to follow up with malignancy statistics. It highlights the need for every organization to utilize a care coordination process for diagnostic testing. The design of this QI project provided redundancy to the tracking process of care coordination with diagnostic testing. As the literature advised standardization of processes provided a positive impact for care coordination with diagnostic testing. For any process to function, you must have staff buy-in, 96% of the clinic's staff were satisfied with the diagnostic testing process, further aiding the process's effectiveness.

Although the project was implemented and a process for care coordination with diagnostic testing was introduced, limitations occurred. The Shiawassee Free Medical Clinic operates on limited hours, from 0700-1100 on the first and third Saturday of the month. This directly limited the number of diagnostic tests to follow up on, along with the variable rate of clinic encounters, ranging from 6 persons to 28 persons. Hours of operation and staff can also be thought of as a limitation, as was exhibited during the last week of project implementation when one clerk was ill and another quit the clinic. This one mid-eastern Michigan rural free clinic provided a limited sample size, and the short duration of the QI project was also limiting. The QI project occurred from January 6, 2024, to March 16, 2024, and only on the first and third Saturdays of the month; thus, the diagnostic testing process was only in process for six clinic sessions over 10 weeks. Another glaring limitation was observed during the last week of project implementation: the two newly hired clerks had access to the rural hospital's electronic health record, creating easier access to testing results. Having increased access to health diagnostic testing results assuredly would have changed the diagnostic testing process.

Cost Benefit Analysis

With minimal monetary costs (see Appendix P) associated with the implementation of this diagnostic testing process and the potential costs of not communicating diagnostic testing results, such as seen with the thyroid nodule example, the benefit is clearly seen. Min et al. (2023) conducted a review of a student-run free clinic in Cleveland, Ohio where they found it cost $2.14 per patient. They also identify a range of costs, as another student-run clinic averaged $12.00 per patient (Min et al., 2023). This nongeneralizable information regarding costs at a free clinic provides limited insight. The limited cost for treatment doesn't provide great justification, but a free clinic also acts as a haven the uninsured can attend other than an

emergency room (ER). According to Wallace et al. (2021), 5.7% of a hospital's expenses are for uncompensated care. The operation of free clinics assists in reducing the costs of uncompensated care. In Wallace et al. (2021) study they found patients not directed to a free clinic had increased odds of another hospital admission. Overall, the presence of free clinics reduces costs for all community members. The justified benefit of care coordination with diagnostic testing helps free clinics improve outcomes and manage their population effectively.

Conclusion

In conclusion, this QI project has demonstrated the vital importance of prioritizing care coordination with diagnostic testing within the free clinic setting. Through the QI project's implementation, each provider, clerk, and nurse has had the diagnostic testing process brought to the forefront of their minds and recognized the process as a critical aspect of patient care. A significant milestone was reached during the fourth PDSA cycle, highlighting the real-world impact of a standardized diagnostic testing process. The case of the delayed diagnostic testing result, as brought to light by the main stakeholder, underscores the necessity for a systematic approach to ensuring timely diagnosis and intervention. Moving forward, continued efforts towards standardization and improvement in this area will be crucial in ensuring the highest quality of care for all patients served by the clinic.

Expected outcomes were achieved, as originally devised 80% staff satisfaction was the goal, yet post-process surveys yielded 96% staff satisfaction. The goal of achieving 80% proper documentation of diagnostic test results and their placement into the charts was not only met but exceeded, with a success rate of 96% of the time. The most important measure was staff satisfaction, as now the free clinic employees will focus on continued refinement of

processes and further improvements. Further advancing care coordination with diagnostic testing.

The project surpassed the goal of improving the care coordination process for diagnostic testing by placing a focus on the process. The desired outcomes were exceeded by achieving 96% staff satisfaction with the process along with proper documentation and subsequent placement into the charts compared to the goal of 80%. The redundancy of tracking steps was crucial for these outcomes. This success underscores the dedication of the free clinic employees and volunteers and their commitment to excellence in patient care. With staff engagement and satisfaction high, the clinic is poised to focus on continual refinement and further enhancements in care coordination with diagnostic testing.

References

Ackley, B. J., Swan, B. A., Ladwig, G., & Tucker, S. (2008). *Evidence-based nursing care guidelines: Medical-surgical interventions.* (p. 7). St. Louis, MO: Mosby Elsevier.

Agency for Healthcare Research and Quality. (2014, July). *Fillable Plan Do Study Act (PDSA) Tool for Health Care Quality Improvement (QI).* https://www.ahrq.gov/evidencenow/tools/pdsa-form.html

Agency for Healthcare Research and Quality. (2018a). *Care Coordination*. https://www.ahrq.gov/ncepcr/care/coordination.html

Agency for Healthcare Research and Quality. (2018b). *Improving your Laboratory Testing Process: A Step-by-Step Guide for Rapid-Cycle Patient Safety and Quality Improvement.* https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/quality-resources/tools/lab-testiing/lab-testing-toolkit.pdf

Agency for Healthcare Research and Quality. (2022, July). *Agency for Healthcare Research and Quality: A Profile.* From https://www.ahrq.gov/cpi/about/profile/index.html

Anderson, F. (2021). Connecting Primary Care Providers in Free Clinics with Specialists Via Telehealth: A Pilot Program with Three Miami Clinics. *Journal of Health Care for the Poor & Underserved*, *32*(3), 1–9.

Baugh, R. (2022, September). *Annual Flow Report: Refugees and Asylees:2021*. United States Department of Homeland Security. https://www.dhs.gov/sites/default/files/2022-10/2022_0920_plcy_refugees_and_asylees_fy2021.pdf

Callen, J. L., Westbrook, J. I., Georgiou, A., & Li, J. (2012). Failure to follow-up test results for ambulatory patients: a systematic review. *Journal of general internal medicine*, *27*(10), 1334–1348. https://doi.org/10.1007/s11606-011-1949-5

Centers for Disease Control and Prevention. (2022, June 16). *CDC Promotes and Improves the Health of Refugees Every Day.* https://www.cdc.gov/immigrantrefugeehealth/refugee-health.html

Centers for Medicare & Medicaid Services. (2021, January 01). *Quality Measurement and Quality Improvement.* https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/Quality-Measure-and-Quality-Improvement-

Centers for Medicare & Medicaid Services. (2022, February). *Health Coverage Options for the Uninsured* [Fact Sheet]. Health Insurance Marketplace. https://marketplace.cms.gov/technical-assistance-resources/health-coverage-options-for-uninsured.pdf

Christoff P. (2018). Running PDSA cycles. *Current problems in pediatric and adolescent health care*, *48*(8), 198–201. https://doi.org/10.1016/j.cppeds.2018.08.006

Darnell JS. (2010). Free clinics in the United States: a nationwide survey. *Archives of Internal Medicine, 170(11),* 946-953. https://doi-org.proxy1.cl.msu.edu/10.1001/archinternmed.2010.107

Elder, N. C., McEwen, T. R., Flach, J. M., & Gallimore, J. J. (2009). Management of test results in family medicine offices. *Annals of family medicine*, *7*(4), 343–351. https://doi.org/10.1370/afm.961

Elder, N. C., McEwen, T. R., Flach, J., Gallimore, J., & Pallerla, H. (2010). The management of test results in primary care: does an electronic medical record make a difference?. *Family medicine*, *42*(5), 327–333.

Free Clinics of Michigan (FCOM). (May 2023). *Organizational Documents.* [Annual Report]. https://www.fcomi.org/organizational-documents.html

Free Clinics of Michigan. (n.d.). *Search Free Clinics of Michigan Members by County.* https://www.fcomi.org/find-a-clinic-near-me.html

Health Resources and Service Administration (HRSA). (2020, September 20). *Fact Sheet-Michigan* [Fact sheet]. Retrieved on 10/12/2022 from file:///Users/robertrodway/Downloads/HDW_FactSheet.pdf

Health Resource & Service Administration (n.d.). *Find a Health Center*. https://findahealthcenter.hrsa.gov/?zip=Owosso%252C%2BMI%252C%2BUSA%2B(Shiawassee%2BCounty)&radius=50&incrementalsearch=true

Hickner, J., Graham, D. G., Elder, N. C., Brandt, E., Emsermann, C. B., Dovey, S., & Phillips, R. (2008). Testing process errors and their harms and consequences reported from family medicine practices: a study of the American Academy of Family Physicians National Research Network. *Quality & safety in health care*, *17*(3), 194–200. https://doi.org/10.1136/qshc.2006.021915

Kwan, B. M., Fernald, D., Ferrarone, P., Loskutova, N., Summers Holtrop, J., Staton, E. W., & Westfall, J. M. (2019). Implementation and Evaluation of a Laboratory Safety Process Improvement Toolkit. *Journal of the American Board of Family Medicine : JABFM*, *32*(2), 136–145. https://doi.org/10.3122/jabfm.2019.02.180109

Library of Michigan. (2018, December 03). *Shiawassee*. Michigan.gov. https://www.michigan.gov/libraryofmichigan/public/michigan/county-guides/guides/shiawassee#:~:text=The%20county%20seat%20is%20Corunna.%20The%20county%20is,County%2C%20Livingston%20County%2C%20Ingham%20County%2C%20and%20Gratiot%20County.

Michigan Department of Health and Human Services (MDHHS) (2020). *Michigan 2020 Primary Care Needs Assessment.* https://www.michigan.gov/mdhhs/-/media/Project/Websites/mdhhs/Folder4/Folder27/Folder3/Folder127/Folder2/Folder2

27/Folder1/Folder327/Michigan_Primary_Care_Needs_Assessment.pdf?rev=98f8bb196744456191267b6f4583b5b6

Migration Policy Institute. (2022). *Profile of the Unauthorized Population: United States.* https://www.migrationpolicy.org/data/unauthorized-immigrant-population/state/US#healthinsurance

Min, E., Ekeocha, C., Howarth, M., Keller, T., Shah, Z., Shah, S., & Cooper, R. (2023). The Costs of Operating a Student-run Free Clinic. *Journal of Community Health: The Publication for Health Promotion and Disease Preventon, 48(6),* 926-931. https://doi-org.proxy2.cl.msu.edu/10.1007/s10900-023-01252-2

Minnesota Department of Health. (n.d.) *SWOT Analysis.* https://www.health.state.mn.us/communities/practice/resources/phqitoolbox/swot.html

Mitchell, J., & Shan, G. (2020). Understanding the Economic Behavior of the Medically Uninsured in the United States. *Hospital Topics*, *98*(4), 184–194. https://doi-org.proxy1.cl.msu.edu/10.1080/00185868.2020.1813669

Mosley, D. DeBehnke, D. (2019, February). *Rural Hospital Sustainability: New Data Show Worsening Situation, Residents.* https://cqrcengage.com/ancor/file/X09PcoJsPrh/Navigant_Rural_Hospitals_Report_2019.pdf

National Association of Free & Charitable Clinics. (2022a). *Quality Standards.* Retrieved August 29, 2022 from https://nafcclinics.org/our-impact/quality-standards/

National Association of Free & Charitable Clinics. (2022b). *Quality Standards Program (2).* https://nafcclinics.org/wp-content/uploads/2022/01/2022-NAFC-Quality-Standards-Final.pdf

National Association of Free & Charitable Clinics. (2022c). *A look at U.S. Free & Charitable Clinics & Pharmacies* [Fact Sheet]. https://nafcclinics.org/infographics-reports/

National Association of Free & Charitable Clinics (n.d.). *Comparison of Free & Charitable Clinics to Federally Funded Clinics.* [Fact Sheet]. https://nafcclinics.org/wp-content/uploads/2021/09/Comparison-of-Free-Charitable-Clinics-FQHCs-2018.pdf

Qualtrics. (2022). *What is CSAT and how do you measure it?*. https://www.qualtrics.com/experience-management/customer/what-is-csat/

Rozich, J. D., Howard, R. J., Justeson, J. M., Macken, P. D., Lindsay, M. E., & Resar, R. K. (2004). Standardization as a mechanism to improve safety in health care. *Joint Commission journal on quality and safety*, *30*(1), 5–14. https://doi.org/10.1016/s1549-3741(04)30001-8

Shiawassee Free Medical Clinic-For the Uninsured. (n.d.). *About.* Retrieved August 15, 2022 from http://www.shiawasseefreemedicalclinic.org/about.html

Singh, H., Thomas, E. J., Mani, S., Sittig, D., Arora, H., Espadas, D., Khan, M. M., & Petersen, L. A. (2009). Timely follow-up of abnormal diagnostic imaging test results in an outpatient setting: are electronic medical records achieving their potential?. *Archives of internal medicine*, *169*(17), 1578–1586. https://doi.org/10.1001/archinternmed.2009.263

Singh, H., & Vij, M. S. (2010). Eight recommendations for policies for communicating abnormal test results. *Joint Commission journal on quality and patient safety*, *36*(5), 226–232. https://doi.org/10.1016/s1553-7250(10)36037-5

The Free Clinics. (2019). *What is a Free Clinic*? https://www.thefreeclinics.org/what-is-a-free-clinic/

Tolbert, J. Oregra, K. Damico, A. (2020, November 06). *Key Facts about the Uninsured Population.* *https://www.kff.org/uninsured/issue-brief/key-facts-about-the-uninsured-population/*

United States Census Bureau. (2020). *Small Area Health Insurance Estimates.* https://www.census.gov/data-tools/demo/sahie/#/?s_statefips=26&s_year=2020&s_stcou=26037,26049,26057,26145,26155

United States Census Bureau. (2021). *ACS 1-Year Estimates Data Profiles.* [SAS Data file]. Retrieved from https://data.census.gov/cedsci/table?q=DP02&g=0400000US26&tid=ACSDP1Y2021.DP02

Wallace, S., Johnson, T. J., Hendel, E., Chakravarthy, V., Leanos, L., & Ansell, D. A. (2021). The Financial Impact of a Partnership Between an Academic Medical Center and a Free Clinic. *The American journal of medicine, 134(11),* 1389-1395. E4. https://doi.org/10.1016/j.amjmed.2021.06.011

Worth, G., Martin, T., Christian, R., & Palokas, M. (2020). Free clinic oversight and outcomes in the United States: a scoping review protocol. *JBI Database of Systematic Reviews and Implementation Reports*, *18*(7), 1522. https://doi-org.proxy2.cl.msu.edu/10.11124/JBISRIR-D-19-00176

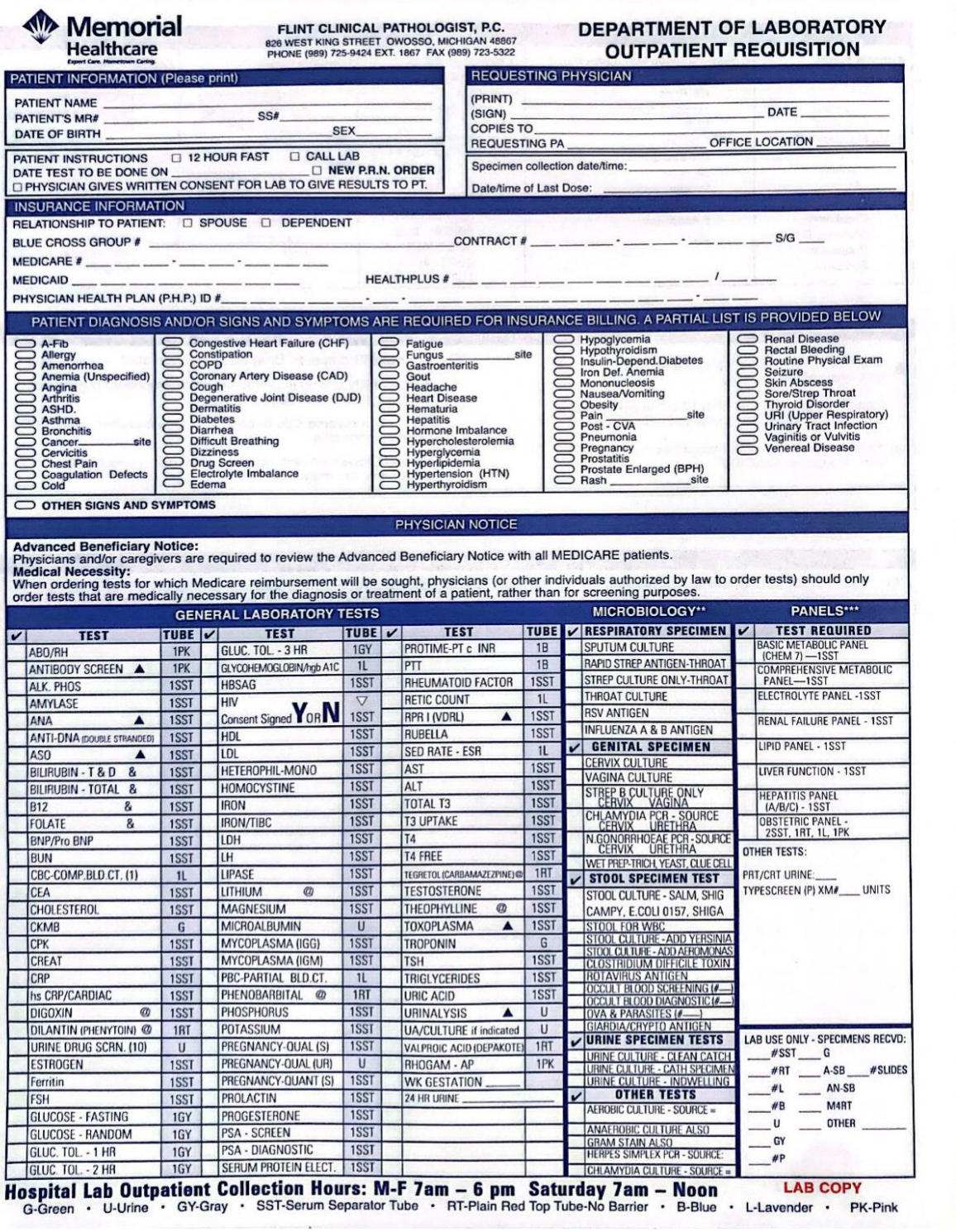
Appendix A

SWOT Analysis

Strengths	**Weaknesses**
• Rapport with Patients • Free services offered • Dedicated volunteer staff • Length of time serving community • Stewardship of funding	• Undefined mission statement and values • Lack of policies and procedures • Lack of leadership structure • Funding • Electronic health record, paper format currently • Minimal preventative health education • Coordination of follow up and community referrals • Social service assistance • Hours of operation
Opportunities	**Threats**
• Increase relationship with Memorial Healthcare Owosso for volunteers, resources, and monetary challenges. • Create relationships with academia for resources and quality improvement. • Implementation of EHR along with increasing use of technology for patient demographics, assessments, treatments, and plans. • Implementation of yearly CPR training one day per year after clinic. • Implementation of policies, procedures, quality measures • Improvement of charting system in current form (paper). • Implement preventative health education and care. • Alignment with Free Clinics of Michigan (FCOM) Quality Standards • Professional assistance for grant funding • Improvement of organization structure, mission statement, values, and organizational goals. • Obtain voluntary services of social work and mental health professionals	• Volunteer loss • Discounted diagnostic services loss • Discounted rental pricing for clinic site • Liability of MDs, RNs, Clerks • Law related violations

Appendix B

Laboratory Testing Form



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DEPARTMENT OF LABORATORY
OUTPATIENT REQUISITION

PATIENT INFORMATION (Please print)
PATIENT NAME
PATIENT'S MR# SS#
DATE OF BIRTH SEX

REQUESTING PHYSICIAN
(PRINT)
(SIGN) DATE
COPIES TO
REQUESTING PA OFFICE LOCATION

PATIENT INSTRUCTIONS ☐ 12 HOUR FAST ☐ CALL LAB
DATE TEST TO BE DONE ON ☐ NEW P.R.N. ORDER
☐ PHYSICIAN GIVES WRITTEN CONSENT FOR LAB TO GIVE RESULTS TO PT.

Specimen collection date/time:
Date/time of Last Dose:

INSURANCE INFORMATION
RELATIONSHIP TO PATIENT: ☐ SPOUSE ☐ DEPENDENT
BLUE CROSS GROUP # CONTRACT # S/G
MEDICARE #
MEDICAID HEALTHPLUS #
PHYSICIAN HEALTH PLAN (P.H.P.) ID #

PATIENT DIAGNOSIS AND/OR SIGNS AND SYMPTOMS ARE REQUIRED FOR INSURANCE BILLING. A PARTIAL LIST IS PROVIDED BELOW

- A-Fib
- Allergy
- Amenorrhea
- Anemia (Unspecified)
- Angina
- Arthritis
- ASHD.
- Asthma
- Bronchitis
- Cancer site
- Cervicitis
- Chest Pain
- Coagulation Defects
- Cold
- Congestive Heart Failure (CHF)
- Constipation
- COPD
- Coronary Artery Disease (CAD)
- Cough
- Degenerative Joint Disease (DJD)
- Dermatitis
- Diabetes
- Diarrhea
- Difficult Breathing
- Dizziness
- Drug Screen
- Electrolyte Imbalance
- Edema
- Fatigue
- Fungus site
- Gastroenteritis
- Gout
- Headache
- Heart Disease
- Hematuria
- Hepatitis
- Hormone Imbalance
- Hypercholesterolemia
- Hyperglycemia
- Hyperlipidemia
- Hypertension (HTN)
- Hyperthyroidism
- Hypoglycemia
- Hypothyroidism
- Insulin-Depend.Diabetes
- Iron Def. Anemia
- Mononucleosis
- Nausea/Vomiting
- Obesity
- Pain site
- Post - CVA
- Pneumonia
- Pregnancy
- Prostatitis
- Prostate Enlarged (BPH)
- Rash site
- Renal Disease
- Rectal Bleeding
- Routine Physical Exam
- Seizure
- Skin Abscess
- Sore/Strep Throat
- Thyroid Disorder
- URI (Upper Respiratory)
- Urinary Tract Infection
- Vaginitis or Vulvitis
- Venereal Disease

☐ OTHER SIGNS AND SYMPTOMS

PHYSICIAN NOTICE

Advanced Beneficiary Notice:
Physicians and/or caregivers are required to review the Advanced Beneficiary Notice with all MEDICARE patients.
Medical Necessity:
When ordering tests for which Medicare reimbursement will be sought, physicians (or other individuals authorized by law to order tests) should only order tests that are medically necessary for the diagnosis or treatment of a patient, rather than for screening purposes.

GENERAL LABORATORY TESTS

✔	TEST	TUBE	✔	TEST	TUBE	✔	TEST	TUBE
	ABO/RH	1PK		GLUC. TOL. - 3 HR	1GY		PROTIME-PT c INR	1B
	ANTIBODY SCREEN ▲	1PK		GLYCOHEMOGLOBIN/hgb A1C	1L		PTT	1B
	ALK. PHOS	1SST		HBSAG	1SST		RHEUMATOID FACTOR	1SST
	AMYLASE	1SST		HIV	▽		RETIC COUNT	1L
	ANA ▲	1SST		Consent Signed Y OR N	1SST		RPR I (VDRL) ▲	1SST
	ANTI-DNA (DOUBLE STRANDED)	1SST		HDL	1SST		RUBELLA	1SST
	ASO ▲	1SST		LDL	1SST		SED RATE - ESR	1L
	BILIRUBIN - T & D &	1SST		HETEROPHIL-MONO	1SST		AST	1SST
	BILIRUBIN - TOTAL &	1SST		HOMOCYSTINE	1SST		ALT	1SST
	B12 &	1SST		IRON	1SST		TOTAL T3	1SST
	FOLATE &	1SST		IRON/TIBC	1SST		T3 UPTAKE	1SST
	BNP/Pro BNP	1SST		LDH	1SST		T4	1SST
	BUN	1SST		LH	1SST		T4 FREE	1SST
	CBC-COMP.BLD.CT. (1)	1L		LIPASE	1SST		TEGRETOL (CARBAMAZEPINE) @	1RT
	CEA	1SST		LITHIUM @	1SST		TESTOSTERONE	1SST
	CHOLESTEROL	1SST		MAGNESIUM	1SST		THEOPHYLLINE @	1SST
	CKMB	G		MICROALBUMIN	U		TOXOPLASMA ▲	1SST
	CPK	1SST		MYCOPLASMA (IGG)	1SST		TROPONIN	G
	CREAT	1SST		MYCOPLASMA (IGM)	1SST		TSH	1SST
	CRP	1SST		PBC-PARTIAL BLD.CT.	1L		TRIGLYCERIDES	1SST
	hs CRP/CARDIAC	1SST		PHENOBARBITAL @	1RT		URIC ACID	1SST
	DIGOXIN @	1SST		PHOSPHORUS	1SST		URINALYSIS ▲	U
	DILANTIN (PHENYTOIN) @	1RT		POTASSIUM	1SST		UA/CULTURE if indicated	U
	URINE DRUG SCRN. (10)	U		PREGNANCY-QUAL (S)	1SST		VALPROIC ACID (DEPAKOTE)	1RT
	ESTROGEN	1SST		PREGNANCY-QUAL (UR)	U		RHOGAM - AP	1PK
	Ferritin	1SST		PREGNANCY-QUANT (S)	1SST		WK GESTATION	
	FSH	1SST		PROLACTIN	1SST		24 HR URINE	
	GLUCOSE - FASTING	1GY		PROGESTERONE	1SST			
	GLUCOSE - RANDOM	1GY		PSA - SCREEN	1SST			
	GLUC. TOL. - 1 HR	1GY		PSA - DIAGNOSTIC	1SST			
	GLUC. TOL. - 2 HR	1GY		SERUM PROTEIN ELECT.	1SST			

MICROBIOLOGY**

- ✔ RESPIRATORY SPECIMEN
  - SPUTUM CULTURE
  - RAPID STREP ANTIGEN-THROAT
  - STREP CULTURE ONLY-THROAT
  - THROAT CULTURE
  - RSV ANTIGEN
  - INFLUENZA A & B ANTIGEN
- ✔ GENITAL SPECIMEN
  - CERVIX CULTURE
  - VAGINA CULTURE
  - STREP B CULTURE ONLY CERVIX VAGINA
  - CHLAMYDIA PCR - SOURCE CERVIX URETHRA
  - N.GONORRHOEAE PCR - SOURCE CERVIX URETHRA
  - WET PREP-TRICH, YEAST, CLUE CELL
- ✔ STOOL SPECIMEN TEST
  - STOOL CULTURE - SALM, SHIG CAMPY, E.COLI 0157, SHIGA
  - STOOL FOR WBC
  - STOOL CULTURE - ADD YERSINIA
  - STOOL CULTURE - ADD AEROMONAS
  - CLOSTRIDIUM DIFFICILE TOXIN
  - ROTAVIRUS ANTIGEN
  - OCCULT BLOOD SCREENING (#—)
  - OCCULT BLOOD DIAGNOSTIC (#—)
  - OVA & PARASITES (#—)
  - GIARDIA/CRYPTO ANTIGEN
- ✔ URINE SPECIMEN TESTS
  - URINE CULTURE - CLEAN CATCH
  - URINE CULTURE - CATH SPECIMEN
  - URINE CULTURE - INDWELLING
- ✔ OTHER TESTS
  - AEROBIC CULTURE - SOURCE =
  - ANAEROBIC CULTURE ALSO
  - GRAM STAIN ALSO
  - HERPES SIMPLEX PCR - SOURCE:
  - CHLAMYDIA CULTURE - SOURCE =

PANELS***

✔	TEST REQUIRED
	BASIC METABOLIC PANEL (CHEM 7) —1SST
	COMPREHENSIVE METABOLIC PANEL—1SST
	ELECTROLYTE PANEL -1SST
	RENAL FAILURE PANEL - 1SST
	LIPID PANEL - 1SST
	LIVER FUNCTION - 1SST
	HEPATITIS PANEL (A/B/C) - 1SST
	OBSTETRIC PANEL - 2SST, 1RT, 1L, 1PK

OTHER TESTS:

PRT/CRT URINE:____
TYPESCREEN (P) XM#____ UNITS

LAB USE ONLY - SPECIMENS RECVD:
____#SST ____G
____#RT ____A-SB ____#SLIDES
____#L ____AN-SB
____#B ____M4RT
____U ____OTHER _____
____GY
____#P

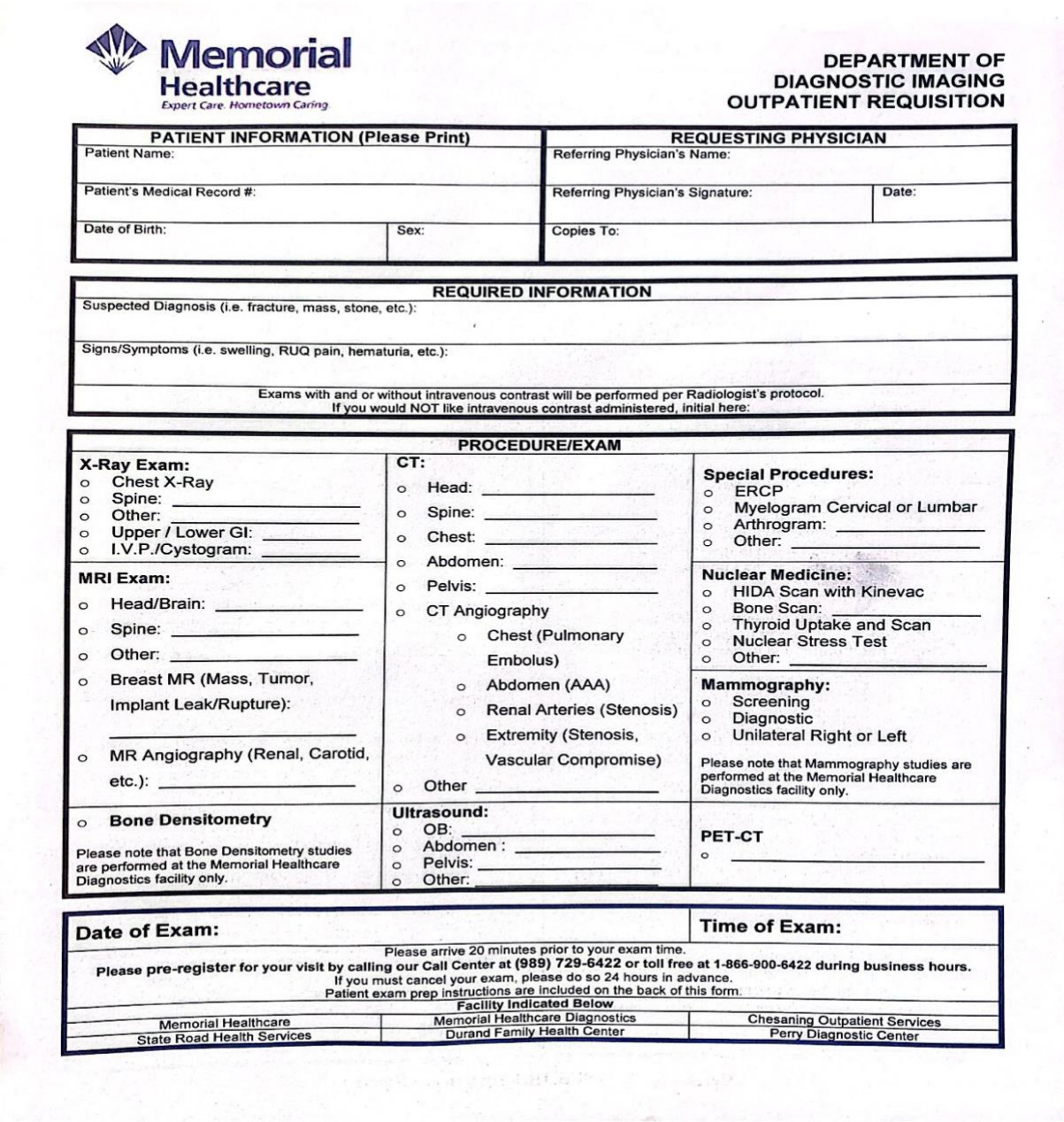
Hospital Lab Outpatient Collection Hours: M-F 7am – 6 pm Saturday 7am – Noon

LAB COPY

G-Green • U-Urine • GY-Gray • SST-Serum Separator Tube • RT-Plain Red Top Tube-No Barrier • B-Blue • L-Lavender • PK-Pink

Appendix C

Diagnostic Imaging Form



Memorial Healthcare
Expert Care. Hometown Caring.

DEPARTMENT OF DIAGNOSTIC IMAGING OUTPATIENT REQUISITION

PATIENT INFORMATION (Please Print)		REQUESTING PHYSICIAN	
Patient Name:		Referring Physician's Name:	
Patient's Medical Record #:		Referring Physician's Signature:	Date:
Date of Birth:	Sex:	Copies To:	

REQUIRED INFORMATION

Suspected Diagnosis (i.e. fracture, mass, stone, etc.):

Signs/Symptoms (i.e. swelling, RUQ pain, hematuria, etc.):

Exams with and or without intravenous contrast will be performed per Radiologist's protocol.
If you would NOT like intravenous contrast administered, initial here:

PROCEDURE/EXAM

X-Ray Exam:
- o Chest X-Ray
- o Spine: _____
- o Other: _____
- o Upper / Lower GI: _____
- o I.V.P./Cystogram: _____

MRI Exam:
- o Head/Brain: _____
- o Spine: _____
- o Other: _____
- o Breast MR (Mass, Tumor, Implant Leak/Rupture): _____
- o MR Angiography (Renal, Carotid, etc.): _____

o **Bone Densitometry**

Please note that Bone Densitometry studies are performed at the Memorial Healthcare Diagnostics facility only.

CT:
- o Head: _____
- o Spine: _____
- o Chest: _____
- o Abdomen: _____
- o Pelvis: _____
- o CT Angiography
  - o Chest (Pulmonary Embolus)
  - o Abdomen (AAA)
  - o Renal Arteries (Stenosis)
  - o Extremity (Stenosis, Vascular Compromise)
- o Other _____

Ultrasound:
- o OB: _____
- o Abdomen : _____
- o Pelvis: _____
- o Other: _____

Special Procedures:
- o ERCP
- o Myelogram Cervical or Lumbar
- o Arthrogram: _____
- o Other: _____

Nuclear Medicine:
- o HIDA Scan with Kinevac
- o Bone Scan: _____
- o Thyroid Uptake and Scan
- o Nuclear Stress Test
- o Other: _____

Mammography:
- o Screening
- o Diagnostic
- o Unilateral Right or Left

Please note that Mammography studies are performed at the Memorial Healthcare Diagnostics facility only.

PET-CT
- o _____

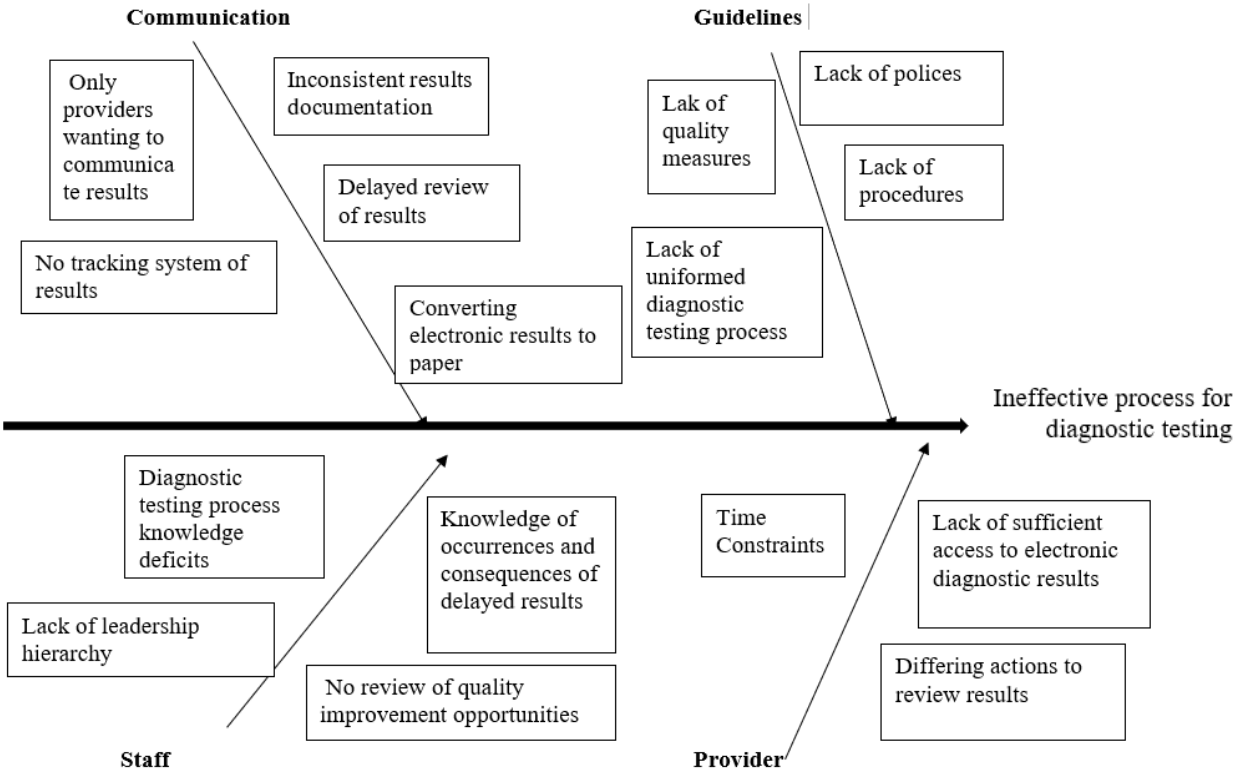
Date of Exam: | **Time of Exam:**

Please arrive 20 minutes prior to your exam time.
Please pre-register for your visit by calling our Call Center at (989) 729-6422 or toll free at 1-866-900-6422 during business hours.
If you must cancel your exam, please do so 24 hours in advance.
Patient exam prep instructions are included on the back of this form.

Facility Indicated Below

Memorial Healthcare	Memorial Healthcare Diagnostics	Chesaning Outpatient Services
State Road Health Services	Durand Family Health Center	Perry Diagnostic Center

Appendix D
Fish Bone Diagram



Appendix E

Synthesis Table

	Process stages	Standardized processes	EMR versus Paper	Policy for diagnostic test process
Callen et al. (2012).	X	X		
Elder et al. (2009).			X	
Elder et al. (2010).	X	X	X	
Hickner et al. (2008).	X	X	X	
Kwan et al. (2019).		X		
Singh et al. (2009).	X	X	X	X
Singh & Vij. (2010).		X		X

Appendix F:

Literature Review Table

Citation	Level of evidence	Study Description/Aim	Data Source	Sample	Measurement	Strengths/Limitations/Outcomes
Callen et al. (2012).	Systematic review of qualitative studies Level V	-Evaluate the consequences of deficient follow up on test results.	-Review of five databases from 1995-2010.	- 19 articles included for synthesis.	-Failure to follow up numerical data. - Consequences on patient outcomes.	**Strengths**: Large number of studies, variety of healthcare settings in study. **Limitations:** Medical record review, not generalizable as all studies from the United States. **Implications:** Advises organizations to have processes and policies for test follow-up substantiated by negative patient outcomes if no follow-up occurs.
Elder et al. (2009).	Qualitative review Level VI	Exploration of diagnostic test results management.	-Chart reviews that included diagnostic testing orders. -Staff observation, surveys & interviews. -Patient surveys	- Four primary care settings. -100 chart reviews -17 stake holder interviews -221 patient surveys	-Audio recordings for interviews -Data input into qualitative computer program for analysis.	**Strengths:** Study sample and measurements, **Limitations:** Not generalizable, small region of study. Offices agreed to participate. **Implications:** Diagnostic test results management and policy lacking. Study uncovered need for technology and safety awareness.
Elder et al. (2010).	Qualitative review Level VI	-Evaluate effectiveness of electronic medical record (EMR) when managing test results compared to paper.	-Chart reviews associated with diagnostic testing orders.	- Eight primary care settings, -200 chart reviews, 461 results -Conferences to uncover test result management processes	- Assessed five areas of test result management in chart reviews. -Assembled demographic data of population. -Diagnostic testing processes review. -Chi-Square analysis for data	**Strengths:** Number of results reviewed for data, data related to documentation. Review of standardized processes. Mixture of paper and electronic health systems. **Limitations:** Mostly urban setting. Lack of patient surveys, any form of observation. No prototypical diagnostic test management system in study. **Implications:** EMR not used to maximum ability. Lack of standardized processes for susceptible parts of diagnostic testing.
Hickner et al. (2008).	Qualitative review Level VI	-Evaluate diagnostic testing process mistakes in primary care.	-Survey to health professionals in primary care setting. - Self reported diagnostic test process errors.	- Eight primary care settings, one FQHC. -243 contributors to study -966 process errors with 590 event reports.	- Differentiated settings with high and low-quality processes. -Descriptive and chi-square analysis of data.	**Strengths:** 7 different states, variable size of practice, variety of urban and rural settings. **Limitations:** Allowed participants to define "errors." Small sample size and incomplete demographic data. **Implications:** Primary care settings must increase process improvements for diagnostic testing.
Kwan et al. (2019).	Descriptive study Level VI	-Evaluate findings of implementation of diagnostic testing process toolkit.	-Conducted staff interviews, observed clinics, and obtained	-Two primary care clinics - 39 providers participated	- Beginning, middle, and end interview of healthcare professionals experience of	**Strengths:** Toolkit's ease of use. No patient surveys. **Limitations:** Small sample size, not generalizable. Limited time of implementation.

			characteristic data.		toolkit implementation. -Utilized interviews to document themes from participant experience.	**Implications:** Diagnostic testing process toolkit useable and useful.
Singh et al. (2009).	Qualitative review Level VI	- Obtain information to lead to interventions to improve care coordination with abnormal diagnostic imaging results.	-Department of Veteran Affairs (VA) EMR historical review	- one main VA campus and five community-based clinics, outpatient settings. -Review period November 2007-June 2008. -1196 diagnostic imaging notifications	- EMR review of of abnormal diagnostic imaging result notifications that either had inefficient responses or inefficient time dependent follow up	**Strengths**: Large number of alerts reviewed. Large sample size, thorough methods, study review length. **Limitations:** Not generalizable, only VA facilities in study and only EMRs studied. **Implications:** EMR with alerts did not resolve care coordination issues with diagnostic imaging for abnormal results.
Singh & Vij. (2010).	Expert/ committee opinion Level VII	-Suggested policies for abnormal test results.	- Joint commission	-Utilized Joint Commission's patient safety goals along with VA directive.	- Suggested eight areas to focus policies for abnormal test results.	**Strengths:** Recommendations can be applied to EMR and paper settings, also applied to inpatient and outpatient settings. **Limitations:** Lowest level of evidence. Only implemented at one VA facility. **Implications:** Useful recommendations to create policy for care coordination related to abnormal results.

Appendix G

Level of Evidence

Level of evidence (LOE)	Description
Level I	Evidence from a systematic review or meta-analysis of all relevant RCTs (randomized controlled trial) or evidence-based clinical practice guidelines based on systematic reviews of RCTs or three or more RCTs of good quality that have similar results.
Level II	Evidence obtained from at least one well-designed RCT (e.g. large multi-site RCT).
Level III	Evidence obtained from well-designed controlled trials without randomization (i.e. quasi-experimental).
Level IV	Evidence from well-designed case-control or cohort studies.
Level V	Evidence from systematic reviews of descriptive and qualitative studies (meta-synthesis).
Level VI	Evidence from a single descriptive or qualitative study.
Level VII	Evidence from the opinion of authorities and/or reports of expert committees.

(Ackley et al., 2008)

Appendix H

Project Sheet Step 1: Test Order Tracking Sheet

Clinic date:

A) Number of diagnostic tests ordered during the clinic session.

B) Number diagnostic test orders were placed into the chart.

C) Number of diagnostic test orders placed into the management folder.

Appendix I

Project Sheet Step 2: Test Results Tracking or Analytic Process

Previous Clinic date: Current clinic date:

A) Number of diagnostic test results expected to receive.

B) Number of diagnostic test results received.

C) Number of diagnostic test results not received (Place quantity here and on sheet *step 2.5*).

D) Number of diagnostic test results placed into the patient's chart.

Appendix J

Project Sheet Step 2.5: Test Results Tracking or Analytic Process

Previous Clinic date: Current clinic date:

A) Number of diagnostic test results not received.

B) Number of patients contacted.

C) Number of records obtained from diagnostic testing center.

Appendix K

Project Sheet Step 4: Test Results Reviewed or Post-Analytic Phase

Previous Clinic Date: Current Clinic date:

Number of results expected to review

Documentation of communication method

Number of Result	PERSON	MAIL	PHONE	Date communicated
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

Appendix L

Staff Diagnostic Testing Pre-Process Survey

Q1: What is your role in the Shiawassee Free Medical Clinic?

Provider Staff Nurse Clerk Support Staff

Q2: I am comfortable with my role overall in the diagnostic testing Process

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q3: I see the diagnostic testing process as functioning effectively in practice within the clinic.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q4: I understand my role in the diagnostic testing process in its current state.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q5: I am satisfied with the diagnostic testing process currently in practice.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q6: Every diagnostic test ordered has the orders placed into the patient's chart.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree

1	2	3	4	5

Q7: Every diagnostic testing result paper is placed into the patient's chart.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q8: Every diagnostic testing result has documentation of how and when the results were communicated to the patient.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Appendix M

Staff Diagnostic Testing Post-Process Survey

Q1: What is your role in the Shiawassee Free Medical Clinic?

Provider Staff Nurse Clerk Support Staff

Q2: I am comfortable with my role overall implemented diagnostic testing process

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q3: I see the diagnostic testing process as functioning in practice within the clinic.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q4: During the implementation of the diagnostic testing process, I was able to provide input to adjust the process if needed.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q4: I believe that this diagnostic testing process has had a positive impact on our clinic and patient population.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Q5: I am satisfied with the diagnostic testing process that has been implemented.

Strongly disagree	Disagree	Neither disagree Or agree	Agree	Strongly Agree
1	2	3	4	5

Appendix N

Project Timeline

Task	Priority	22-Nov	23-Dec	24-Jan	24-Feb	24-Mar	24-Apr	24-May
MSU IRB	Normal	X						
Staff Education	Normal		x	x				
Process Implementation	Normal			x	x	x		
Data Analysis	Normal					x		
Project Dissemination	Normal						x	x

Appendix O

PDSA Cycle 1-5

PLAN DO STUDY ACT (PDSA) FORM

Project Title	Doctor of Nursing Practice Evidenced Based Quality Improvement Project: Free Medical Clinic Diagnostic Testing Process Improvement	**Cycle #:** 1-6 **Start Date:** 01/06/24 **End Date:** 03/16/24 **Project Lead**: Robert R.

Objective of this Cycle:

☐ Develop a Change ☐ Test a Change ■ Implement a Change

Aim Statement:

- ***Specific- targeted population:*** Medical staff at a free clinic in mid-eastern rural Michigan implementing a newly designed diagnostic testing process to improve care coordination with diagnostic testing.
- ***Measurable- what to measure and clearly stated goal:*** The overarching goal is to improve care coordination with diagnostic testing by means of a uniform process. The measurable outcome is to obtain 80% staff satisfaction, 80% proper documentation of results, and 80% correct placement of reviewed results into the patient's chart for diagnostic testing.
- ***Achievable- brief plan to accomplish it:*** The designed process discussed in the methods section of the above-titled paper will provide further detailed insight, but a designed standardized process will be implemented for a process for care coordination with diagnostic testing after conducting a thorough literature review. Each PDSA cycle, each diagnostic test ordered will be tracked from ordering to placing into the chart after the provider reviews the diagnostic testing results with the patient. The process involves four steps. A tracking process using redundancy with tracking will increase the chances of obtaining the desired measurable outcomes.
- ***Relevant- why is it important to do now:*** Prior to implementation, there was no designed process or policy related to diagnostic testing, and each individual provider conducted their own process**.** After conducting a thorough literature review it was determined that standardization improves outcomes for patients with care coordination for diagnostic testing. A missing test result can delay patient care negatively affecting the person's health outcomes.
- ***Time Specific- anticipated length of cycle***: each PDSA cycle will run from step 1 to step 4, all six clinics were considered a PDSA cycle.

PLAN

Test/Implementation Plan:

PDSA cycle clinic date 1/6/24-Step one of the diagnostic testing process was conducted by the clerk at the free clinic, which entailed the initial step of test tracking. No changes to the diagnostic testing process occurred during the first week of implementation.
PDSA cycle clinic date 1/20/24- During this clinic, the clerk began the day conducting steps two and two and a half of the diagnostic testing process, then proceeds to step 4. A change will be added for numerical tracking of "number of records obtained from diagnostic testing center."
PDSA cycle clinic date 2/3/24- Implemented change mentioned in second PDSA cycle and discussed adding step addressing not receiving individual ordered tests. Discussion of reviewing labs prior to order was discussed.
PDSA cycle clinic date 2/17/24- Did not change any portion of the process prior to this cycle. After discussion with stakeholders, patients with diagnostic testing will be scheduled to return to the next clinic to discuss results. This occurred as a consequence of a missing diagnostic imaging result that led to the discovery of nodules on the patient's thyroid. Discussed adding a confirmation of orders received by the testing site by fax confirmation page and how to manage off-hours diagnostic test ordering.
PDSA cycle clinic date 3/2/24- Underlined portion of step one, step two and two and a half, and step four project tracking sheets for ease of understanding prior to clinic. Added use of sticky notes placed on the lateral side of project sheet step four in the diagnostic test results management folder to track results taking longer than one clinic to retrieve. Discussed adding a column to the project sheet step four for date and patient initials.
PDSA cycle clinic date 3/16/24- Implemented changes mentioned in the fifth PDSA cycle, adding columns mentioned to project sheet step four. Added extra project sheets results management folder. The current implemented care coordination process with diagnostic testing was accepted with continued adaptations.

Prediction:

The measurable outcomes devised of obtaining 80% ratings via post-process surveys related to staff satisfaction, proper placement into charts and review of diagnostic testing results will be met by the end of the process implementation. I believe that implementing the process will meet the goal of improving the diagnostic testing process.

Data Collection Plan:

What data/measures will be collected?

Data measures collected will be the total number of patients seen, total diagnostic tests ordered, the total amount of blood tests, the total amount of imaging results, staff satisfaction levels, proper documentation of results, and correct placement of diagnostic test results in the chart will be followed during the implementation of the diagnostic testing process.

Who will collect the data?
Data collection will occur weekly via the clerk completing the designed paperwork associated with the designed steps. Project designer will also aid in the collection of data. All paperwork associated with the diagnostic testing process will be locked within the clinic's paper charting cabinets.

When will the collection of data take place?
The clerk will continuously collect data each week by completing the paperwork designed by the project designer. Other data, such as the total number of tests, total number of patients, and type of testing, will be obtained by the project designer via data obtained by the clerk at the last PDSA cycle.

How will the data (measures or observations) be collected and displayed?
Data will be collected by direct documentation via the clerk during each PDSA cycle. The data will be documented in a project binder and subsequently reviewed by the project designer at each clinic session during implementation. After completion of the designed process, the data will be displayed in the analysis section of the project designer's final paper.

What decisions will be made based on data?
Based upon the data at the end of project implementation, a decision to continue the diagnostic testing process as designed or further change the process will be made. The data will help determine if the process of care coordination with diagnostic testing is perceived as effective and sufficient by the affected staff at the free clinic.

DO

Activities/Observations*:*

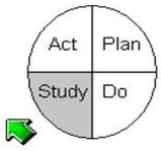
- In the first cycle, there were two tests ordered for eighteen patients at the January 6, 2024 clinic, and the main stakeholder requested to change the process to step four.
- In the second cycle, January 20, 2024, one of two diagnostic tests was received. The clerk contacted the diagnostic imaging department, who faxed the missing result. Out of the four patients seen, one diagnostic test was ordered.
- In the third cycle, February 3, 2024, the only diagnostic test ordered last week was

received. During this clinic four tests were ordered for tracking the following clinic.

- In the third cycle, February 17, 2024, two of four diagnostic tests were received. The clerk contacted the diagnostic testing laboratory, receiving one result record, and the clerk contacted one patient requesting testing to be completed. During this clinic, five diagnostic tests were ordered.
- In the fourth cycle, March 2, 2024, four of five diagnostic tests ordered last week were received. The clerk contacted the diagnostic testing center, receiving the one missing result and the third cycle's missing diagnostic test. During this clinic, five diagnostic tests were ordered.
- In the fifth cycle, March 16, 2024, five of the five diagnostic tests ordered last week were received. During this clinic, ten diagnostic tests were ordered.

- **Record activities/observations that were done in addition to those listed in plan:**

STUDY



Prediction:

The measurable outcomes devised of obtaining 80% ratings via post-process surveys related to staff satisfaction, proper placement into charts and review of diagnostic testing results will be met by the end of the process implementation. I believe that implementing the process will meet the goal of improving the diagnostic testing process.

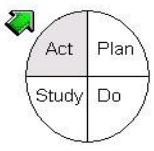
Learning:

During implementation, a total of 90 patients were seen, with a total of 27 persons having diagnostic testing tracking conducted. Of the 27 tests, 7, or approximately 25 %, were imaging, one was a diagnostic biopsy, and the remaining 19, or approximately 70%, were blood tests. As for post-process surveys, 96% of staff were satisfied with the process, and 96% proper documentation of results; subsequently, 96% of results were then placed into the patient charts.

Summary:

As one can infer from reviewing the learning section, which covered numerical outcomes while implementing the diagnostic testing process, outcomes were met. The overall staff satisfaction has and will lead to improvements in care coordination with diagnostic testing. The staff satisfaction will drive continued monitoring and, unknowingly, continued PDSA cycles. There was also hope that implementing would lead to a diagnostic testing policy but that objective was not met as continued PDSA cycles will be made as desired by the stakeholders.

ACT



Describe next PDSA Cycle:

Overall, the project goal was met, but in clinical practice, further adaptations of the designed diagnostic testing process will continue. As the staff reported a high level of satisfaction in post-process surveys, assuredly, they will continue to unknowingly conduct PDSA cycles. During the last week of implementation, two new staff members gained access to diagnostic test results directly through the testing site's electronic health record, creating another foreseeable adaptation of the process.

Appendix P

Project Budget

Personnel	Pay	In-Kind Donation	Total Cost
Clerk	$15.00/hour x 6 hours/2 weeks	*	$180
RN	$0	*	$0
RN	$0	*	$0
MD	$0	*	$0
MD	$0	*	$0
Other Expenses	Estimated Cost	In-Kind Donation	Total Cost
Folders, pens, paper, printing	$50.00	*	$50
Stamp and envelope	$10.00	*	10.00