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Abigail Jean Voss
Grand Valley State University

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**Development of an Advanced Practice Provider Diagnostic Clinic within an Oncology
Practice**

Abigail Voss BSN, RN, OCN

Kirkhof College of Nursing, Grand Valley State University

Doctor of Nursing Practice Student

Abstract

Background: The process of diagnosing cancer and the time to treatment can influence a patient's experience with diagnosis of cancer at a later stage being associated with poorer cancer outcomes and decreased quality of life post-treatment. With increasingly complex oncologic imaging and pathology findings, effective interventions for early diagnosis of cancer requires a cohesive approach including referral, diagnosis, staging, and treatment phases.

Objectives: The aim of this article is to outline the program development efforts initiated to apply current literature findings and organizational assessment to create a program development toolkit and business plan for an Advanced Practice Provider (APP) led diagnostic clinic in an outpatient oncology practice.

Methods: A review of recent literature, application of implementation frameworks, and an organizational assessment guided the creation of the program development toolkit.

Findings: The proposed business plan with break-even analysis demonstrated the need for a minimum number of patients to sustain the diagnostic clinic. The business plan and toolkit displayed the significance and limitations of the goal for increased patient and provider satisfaction.

Keywords: Program Development. Oncology Clinic. Diagnostic Clinic. Cancer. Advanced Practice Provider.

Implications for Practice:

- Program development must be guided by evidence-based research, implementation strategies, and sustainability plans.
- Performing an organizational assessment when adapting program development to individual organizations is vital to influence the impact of the program development.
- An in-depth business plan will be instrumental in adoption and sustainability of the diagnostic clinic program development.

Development of an Advanced Practice Provider Diagnostic Clinic within an Oncology Practice

In the United States (U.S.), it is estimated that 1.9 million people will be diagnosed with cancer in the year 2022 (Siegel et al., 2022). Diagnosis of cancer at a later stage has been associated with poorer cancer outcomes (Richards, 2009). There is a large amount of evidence supporting an earlier diagnosis is associated with improved patient outcomes for breast, colorectal, head and neck, testicular, and melanoma cancers (Neal et al., 2015). Diagnosing cancer can be difficult as an accurate diagnosis can be characterized down to the molecular levels. With increasingly complex oncologic imaging and pathology findings, there are higher risks of diagnostic errors (Nass et al., 2018). Based on personal levels of experience and knowledge, primary care providers may place specialty referrals as confirmation and reassurance of a diagnosis when patients present with vague symptoms (Kirsh et al., 2014).

The COVID-19 pandemic negatively affected the diagnosis and treatment of cancer due to reduced access of care and fear of exposure (Siegel et al., 2022). The diagnosis and treatment delay caused by the pandemic resulted in increased advanced-stage diagnoses and mortality although many of the long-term consequences are still unknown (Siegel et al., 2022). In addition to physical components, patient experience and quality of life post-treatment have been linked to timely cancer diagnosis (Pujadas Botey et al., 2020). Public discontent with long diagnostic periods has been well established (Vedsted & Olsen, 2015). During the diagnostic process, patients report extreme emotional stress and need for supportive care (Pujadas Botey et al., 2020). Delays in time to treatment is another cause for newly diagnosed cancer patients' distress (Khorana et al., 2019). Within the U.S., time to treatment has worsened with the complexity of the U.S. health system (Khorana et al., 2019).

The World Health Organization recognizes that lack of resources and underutilized current resources greatly contribute to the healthcare system's inability to manage new cancer cases (2020). Although the number of oncologist providers is increasing, the number of oncology practices has declined leading to a greater uneven geographic distribution (Kirkwood et al., 2018). There is growing pressure for improved efficiency among oncology practices related to expected shortages of oncologists, the aging population, and growing number of cancer survivors (Bruinooge et al., 2018). Advanced Practice Providers (APPs) have become increasingly employed within oncology settings. APPs are highly involved in patient care including new patient referrals and are vital contributors to increasing access to quality cancer care (Bruinooge et al., 2018).

The purpose of this article is to outline the program development efforts undertaken to apply current literature findings and organizational assessment to create a program development toolkit and business plan for an APP led diagnostic clinic in an outpatient oncology practice.

Methods

Literature Review

A comprehensive search was conducted in the CINAHL Complete, Google Scholars, and PubMed electronic databases for qualitative and quantitative research studies, in the English language, during the period 2012-2022. Populations included were adult cancer patients over the age of 18 in outpatient care settings. Pediatric oncology and studies focusing on reducing time to treatment with an already established diagnosis were excluded. All the studies emphasized designing pathways to assist providers in decreasing diagnostic times for cancer with five studies focused on patients presenting with vague, non-specific symptoms. Interventions included an

oncology streamlined diagnostic process in outpatient offices with the goal to improve quality metrics and cost-savings.

Summary of Findings

The most significant themes of the literature review included cost-effectiveness, clinic operations, and quality metrics. The review highlighted the benefits of a streamlined cancer diagnostic pathway in reducing diagnostic times for patients with vague, nonspecific symptoms. The referral process, providers of care, operational logistics, and diagnostic tools were also examined in multiple studies.

All studies highlighted the difficulty in measuring true cost-savings because there were no control groups. However, all studies stressed probable cost-savings based on reduced diagnostic time. Only one study analyzed the cost reduction with results showing at near or full capacity, the rapid diagnostic clinics outperform standard clinical practice in terms of being less costly and more effective with decreased diagnostic time (Sewell et al., 2020). Monitoring time to diagnosis, time to treatment, and percentage of patients diagnosed with cancer were important quality metrics for performance indicators related to cost-effectiveness.

Overall, decreased time from referral to diagnosis was achieved as a result of the development of the diagnostic clinics programs. The most pertinent measurement was the percentage of patients who participated in the pathway who were subsequently diagnosed with cancer which ranged from 7.3% to 27.3% (Dolly et al., 2020; Ingeman et al., 2015; Martinez et al., 2021; Sewell et al., 2020; Stenman et al., 2019; Vasilakis & Forte, 2021). The median time from referral to cancer diagnosis ranged from 5.8 days to 28 days (Dolly et al., 2020; Ingeman et al., 2015; Martinez et al., 2021; Sewell et al., 2020; Stenman et al., 2019).

The approach to the diagnostic pathways in terms of clinical operations varied among the studies. Sewell et al. (2020) and Vasilakis and Forte (2021) outline the rapid diagnostic clinics to be available two half days each week which proved to be cost-effective. As discovered in England's rapid diagnostic clinics, APPs are able to perform the necessary clinical reviews, assessments, and order appropriate tests for a diagnostic intake clinic (Dolly et al., 2021). Providing a guideline for the referral process to an oncologic intake clinic was shown to be beneficial (Stenman et al., 2019).

Several studies found great satisfaction among providers and patients involved with diagnostic clinics. Patients reported being 'very satisfied' with their experiences citing clear explanations, direct involvement, and speed of the diagnosis and referral process as valued highlights (Vasilakis & Forte, 2021). Local providers appreciated speed of referral, the straightforward process, and reduction of stress on behalf of the providers for referring without a concrete diagnosis (Vasilakis & Forte, 2021).

Organizational Assessment

For the program development initiative, a thorough organizational assessment was critical to applying the findings of the literature review. The Burke and Litwin's Model (1992) was selected as the model identifies the climate and culture influences on change through transactional and transformational factors. The model was utilized to analyze transformational factors identified as leadership, mission, and organizational culture in addition to transactional factors such as system policies, work climate, and tasks (Burke & Litwin, 1992). This was achieved through interviews with key stakeholders, those in leadership and direct roles already involved with the referral process and oncology APPs. This framework helped classify weaknesses and strengths of the program development endeavor in the organization. Reviewing

the organization's mission revealed the desire to improve value of healthcare and to deliver timely care that is patient-centered and evidence-based. The structure of the organization had the components for successful program development in terms of available physical space, referral process, and resources. Following the aftermath of the COVID-19 pandemic, the organization is better equipped to offer virtual visits which is an attractive feature to patients who may have barriers with geography or mobility.

Guiding Framework

The guiding framework for this program development endeavor was the Context, Input, Process, Product (CIPP) Evaluation Model created by Stufflebeam (1983). The CIPP model starts with the "context evaluation" and includes organizational factors such as needs, resources, problems, background, and environment which were identified through the organizational assessment. The "input evaluation" reflects planning the intervention. The third step of "process evaluation" includes developing the program as reflected by the program toolkit deliverables. The fourth component of "product evaluation" encompasses assessing the impact, effectiveness, sustainability and adjustments required following the program implementation (Stufflebeam, 1983). The major domains of the CIPP are shown in Figure 1.

Findings

Program Development Toolkit

The Program Development Toolkit for the APP led oncology diagnostic clinic was based on three components: quality monitoring, fiscal responsibility, and quality care delivery. The toolkit components are outlined in Table 1.

Quality Monitoring

In relation to quality monitoring, pre-implementation data of three months was collected regarding time from referral to visit, time from visit to treatment, and additional testing ordered by physicians. This chart review confirmed there were delays with new patients such as incomplete diagnostic testing. Evidence from literature confirms median time from referral to cancer diagnosis was found to be improved by similar diagnostic intake clinics (Dolly et al., 2021; Ingeman et al., 2015; Martinez et al., 2021; Sewell et al., 2020; Stenman et al., 2019; Vasilakis & Forte, 2021). For the organization, the current average of time from referral to new patient appointment is 7.58 days. One of the goals of the diagnostic clinic aims to have a patient see or speak with a provider within two days. The diagnostic clinic has the potential to decrease time to treatment with earlier involvement during the diagnostic process. The three-month pre-implementation data is displayed in Table 2.

An additional quality monitoring component, a guide to replicate the data collection process post-implementation, was created. Recommendations for future metrics to monitor related to the diagnostic clinic were provided in a proposed program evaluation plan. Specific patient satisfaction survey and staff feedback forms were included in the program evaluation plan (see Figure 2 and 3). Operational and growth metrics were encompassed in the evaluation plan (see Table 3). Patient volumes, diagnoses, and clinic locations are vital measures that will influence the growth plan including adding staff or education measures.

Preliminary data was collected and provided for the first month post-implementation suggesting the implementation had reduced time from referral to visit. The preliminary data (see Figure 4-6) were limited as many diagnostic results were pending during the audit. The two quality measures regarding time from visit to treatment and additional testing ordered by providers were not collected due to the pending results and time constraints.

Quality Care Delivery

The quality care delivery components comprised of a program timeline, intake flowchart, and sustainability plan. The program timeline detailed scheduled goals. The diagnostic clinic intake flowsheet was created to facilitate the intake process when a new referral is placed. The flowchart (see Figure 7) describes steps involving a new patient referral specialist, the APP, the patient, and assistance from physicians when necessary. The intake flowsheet was reflective of the evidence-based recommendation for a referral guideline from Stenman et al. (2019). The toolkit contained a sustainability plan with future strategies for the diagnostic clinic post-implementation which will be important considerations moving forward. Future sustainability strategies include engaging organizational leaders, frequent evaluations of the new program, and maintaining an active advanced practice provider position dedicated to the role of the diagnostic clinic. Determining the origin of the referral and ensuring dissemination of marketing tools for the diagnostic clinic are sustainability strategies tailored to the community impact. The sustainability plan will be influenced by the quality metrics tracked through the evaluation plan.

Fiscal Responsibility

The business plan for this program development was the most critical component for the program implementation and long-term sustainability. The business includes key assumptions and costs, in addition to the literature findings used to project the statement of operations and projected costs. The organization provided reimbursement information for specific billing codes across their three major payers. Reimbursement rates for APPs are 85% of a physician reimbursement. The brief summary of the business plan is shown in Table 4. Additional future state assumptions based on expected growth is displayed in Table 5.

Summary of Business Plan Analysis

From a macro view, the implementation of a diagnostic clinic projects considerable savings in time for the patient. The quality measures of time and patient satisfaction do not have prices associated but are decidedly significant and highly valued by the organization. With increased satisfaction among the community, there is an expected increase in referrals. Increased referrals provide opportunity for growth including the addition of a RN to assist in care.

From the micro view of the organization, the implementation of the diagnostic clinic would be costly but largely depend on the average number of patients seen. The organization has the physical space and capacity for the program. The resources to create and develop the program already exist within the organization. The organization provided reimbursement information for specific billing codes across their three major payers, the number provided in Table 4 is an average of the three major insurance payers. Expected operational costs reflect primarily of provider and staff coverage. The preliminary data (see Figure 4) indicated thirteen patients were seen in the diagnostic clinic during the first month of operation. As awareness of the diagnostic clinic is expected to grow, the program is forecasted to generate revenue greater than the operational costs.

Implications for Practice

Intentional Development

Program development was the solution to care that was evidence-based and sustainable to address the gap of care regarding referrals of undiagnosed patients to an outpatient oncology center. A literature review revealed success from similar diagnostic clinics. Considerations related to the resources of the clinic, current staff, and patient satisfaction were prioritized. The core of the intervention was the program development of a diagnostic clinic led by an APP. Determining the care acuity required of the diagnostic clinic, the number of referrals to the

diagnostic clinic, and the use of ancillary staff members are components that will affect the cost-efficiency of the clinic and thus the sustainability of the clinic.

Preliminary Results

Preliminary data from the first month of operation displayed the diagnostic clinic was successful in reducing the time from referral to new patient visit. The average time from referral to new patient visit was 4.3 days, a decrease by 56% (see Figure 6). Thirteen patients were seen in the first four weeks by an APP. Of the patients seen, 38% were diagnosed with cancer while the remaining patients had pending results (see Figure 5). The time to treatment data is pending at the time of writing. The literature evidence proposes potential cost savings benefits with earlier diagnostic times and greater patient satisfaction. With preliminary data on track to decreasing diagnostic time, the quality metrics will be important indicators for monitoring the patient satisfaction and care delivery.

Conclusion

Program development based on evidence-based practice aligns with the need to partner with referring providers for efficient cancer diagnoses. The diagnostic clinic aligns with the responsibility for improved health care system designs for patients with chronic care needs to have improved outcomes. Reducing barriers to care, increasing diagnostic efficiency, and improving communication among the oncology organization and the community partners has the potential to improve the quality of care received by patients.

Figures**Figure 1**

Context, Input, Process, Product (CIPP) Evaluation Model



Note. Based on “The CIPP Model for program evaluation” by Stufflebeam, D.L (1983).

Evaluation Models: Viewpoints on Educational and Human Services Evaluation, 117-141.

http://dx.doi.org/10.1007/978-94-009-6669-7_1 Image used with permission by Springer

Nature, 2023.

Figure 2*Patient Satisfaction Survey***Patient Satisfaction Survey**

Suggested Staff Script:

After recently starting the Diagnostic Clinic, we are seeking feedback from patients regarding their experience with the clinic. Are you interested in participating a quick survey? It takes only a few minutes and provides information to improve future patient experience and practice. I will read through the question to which you may respond with “strongly disagree, disagree, neutral, agree, or strongly agree”.

1. I was able to be seen in a timely manner at the Diagnostic Clinic.

Strongly Disagree Disagree Neutral Agree Strongly Agree

2. The Diagnostic Clinic was able to answer my questions and concerns appropriately.

Strongly Disagree Disagree Neutral Agree Strongly Agree

3. The Diagnostic Clinic provided appropriate updates to me throughout the process.

Strongly Disagree Disagree Neutral Agree Strongly Agree

4. The Diagnostic Clinic provided appropriate updates to my primary care provider throughout the process.

Strongly Disagree Disagree Neutral Agree Strongly Agree

5. I felt reassured the Diagnostic Clinic was knowledgeable regarding my plan of care.

Strongly Disagree Disagree Neutral Agree Strongly Agree

6. The Diagnostic Clinic was able to coordinate tests in a timely manner with health partners such as the radiology or interventional radiology departments.

Strongly Disagree Disagree Neutral Agree Strongly Agree

7. I would recommend the Diagnostic Clinic to others if they have concern for cancer.

Strongly Disagree Disagree Neutral Agree Strongly Agree

Figure 3*Staff Feedback Form*

Staff Feedback Forms

Staff Involved Feedback

1. What has gone well with the Diagnostic Clinic?
2. What barriers do you encounter when performing your role for the Diagnostic Clinic?
3. Do you feel you have the appropriate resources to complete your role?
4. If no, what resources would benefit your role related to the Diagnostic Clinic?
5. What changes would you suggest for the development of the Diagnostic Clinic?

Indirect Staff Feedback

1. How has the Diagnostic Clinic affected your work?
2. Have you routed a patient to the Diagnostic Clinic? If yes, did you experience any difficulties in the process?
3. Have you received a patient from the Diagnostic Clinic? If yes, were appropriate tests completed prior to seeing the patient?
4. What changes would you suggest for the development of the Diagnostic Clinic?

Figure 4

First month preliminary data: number of patients

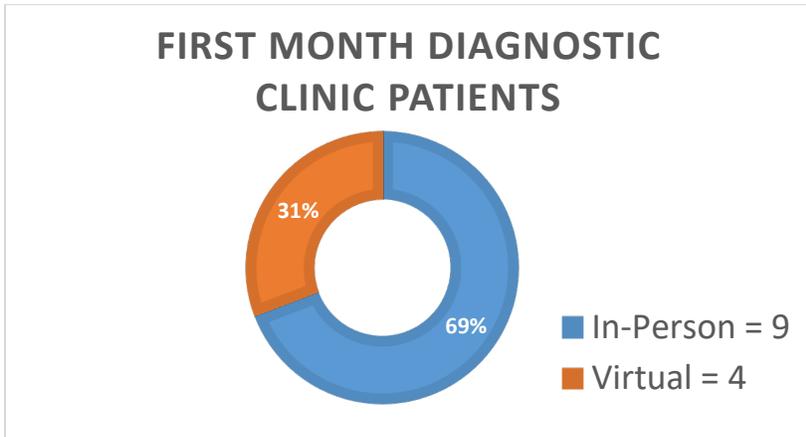


Figure 5

First month preliminary data: percent of diagnoses

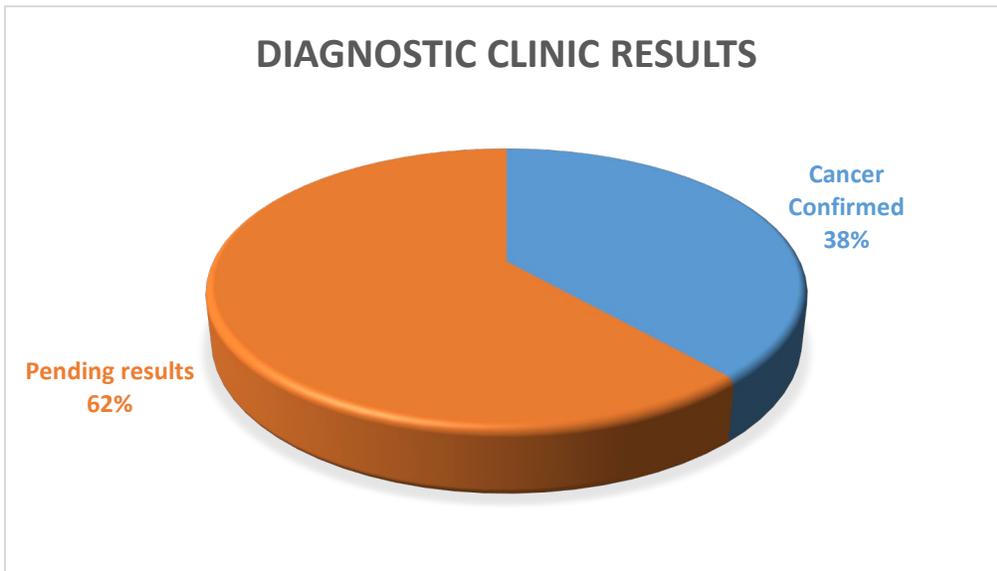


Figure 6

First month preliminary data: average days from referral to visit

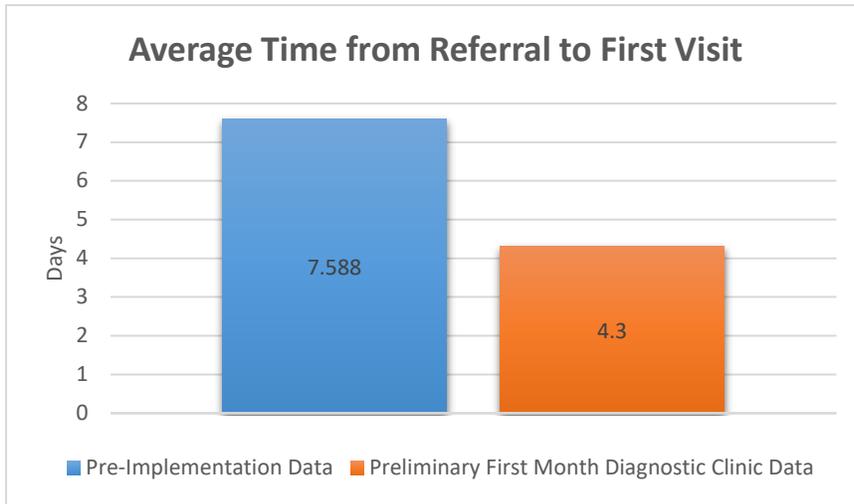
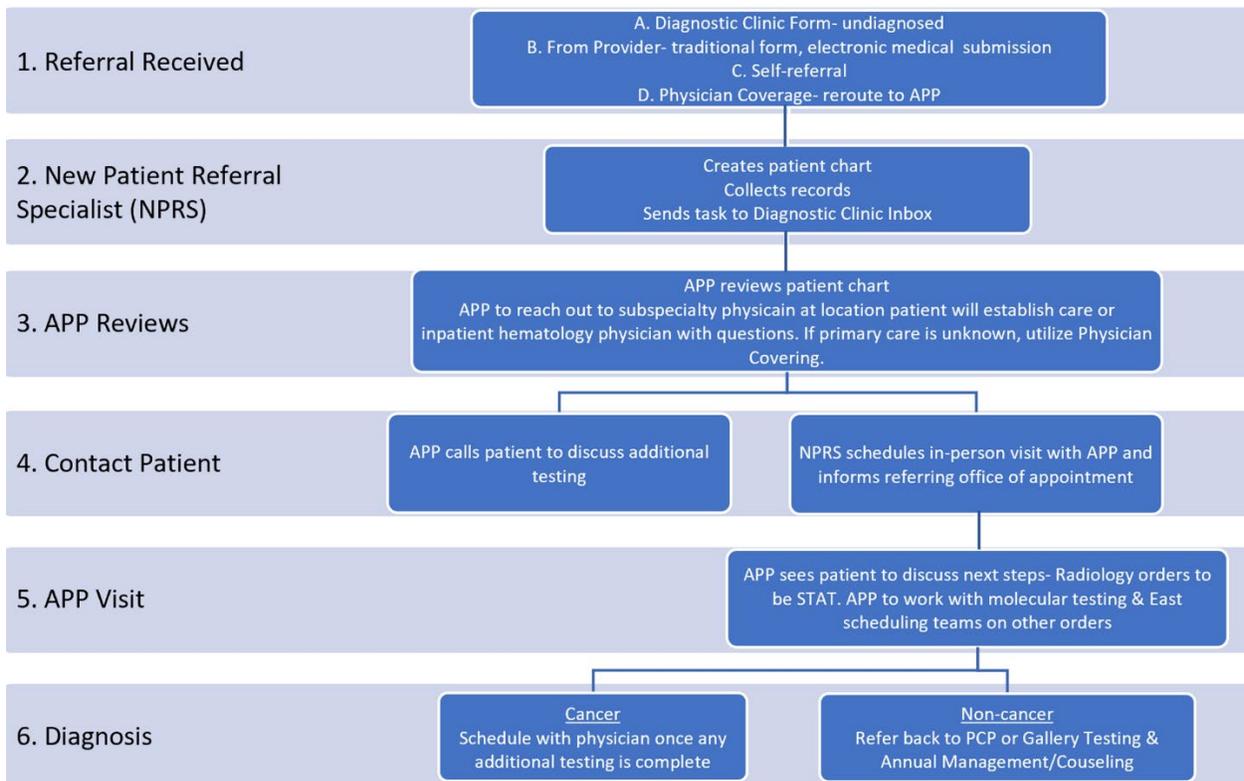


Figure 7

Diagnostic Clinic Intake Flowsheet



Tables

Table 1

Program Development Toolkit Components

| Guiding Component | Toolkit Component |
|------------------------------|---|
| <i>Quality Monitoring</i> | <ul style="list-style-type: none"> • Pre-implementation data • Proposed program evaluation for post-implementation • Patient satisfaction survey regarding Diagnostic Clinic • Staff feedback forms regarding Diagnostic Clinic |
| <i>Quality Care Delivery</i> | <ul style="list-style-type: none"> • Program timeline detailing scheduled goals • Diagnostic Clinic Intake Flow displaying process • Sustainability plan for Diagnostic Clinic |
| <i>Fiscal Responsibility</i> | <ul style="list-style-type: none"> • Business Model encompassing financial analysis, limitations, and forecasted improvements |

Table 2

Three-month pre-implementation data

| Quality Metrics | Pre-Implementation Data | Post-Implementation Data |
|---|--------------------------------|---------------------------------|
| Average days from referral to new patient visit | 7.588 | |
| Average days from new patient visit to start of treatment | 19.94 | |
| Percent of new patient visits requiring physician to order radiology studies | 37% | |
| Percentage of new patient visits requiring physician to order molecular tests | 29% | |

Table 3*Evaluation Plan: Operational and Growth Metrics Excel Spreadsheet*

| DC Visit Date | Time from Referral | In-Person/ Virtual | Cancer Y/N | Diagnosis | Time to Treatment | Clinic Location/ Provider |
|---------------|--------------------|-----------------------|------------|-------------|-------------------|------------------------------|
| 1/16/23 | 3 days | In-person | Y | Lymphoma | 12 days | |
| 1/20/23 | 2 days | Virtual | Y | Pending | Pending | |
| 1/23/23 | 3 days | In-person | Y | Lung Cancer | Pending | |
| 1/23/23 | 3 days | In-person | Pending | Pending | Pending | |
| 1/23/23 | 5 days | In-person | Pending | Pending | Pending | |

Table 4*Summary of Business Plan**Assumptions*

| | |
|---|----------|
| Advanced Practice Provider Coverage per month 12 hours per week (30% of time) Local APP salary- \$116, 000 | \$2,900 |
| Ancillary Staff Coverage New Patient Referral Specialist, Medical Assistant, Scheduler 12 hours per week Average ancillary staff wage- \$17/hour | \$816 |
| Insurance Reimbursement Average per visit New Patient Visit (85% of physician coverage) | \$185.96 |

Monthly Operation Costs

Total Operating Income

| <i>APP and Ancillary Coverage</i> | <i>Total Operating Income (\$3,716)</i> | |
|--|---|--------------|
| <i>Patient Insurance Reimbursement</i> | | |
| 4 patients | \$743.84 | (\$2,975.16) |
| 8 patients | \$1,487.68 | (\$2,228.32) |
| 12 patients | \$2,231.52 | (\$1,484.48) |
| 16 patients | \$2,975.36 | (\$740.64) |
| 20 patients | \$3,719.20 | \$3.20 |
| 24 patients | \$4,463.04 | \$747.04 |

Table 5*Future State Assumptions*

| | |
|---|------------|
| Advanced Practice Provider Coverage per month 20 hours per week (50% of time) Local APP salary- \$116, 000 | \$4,833.33 |
| Ancillary Staff Coverage New Patient Referral Specialist, Licensed Practice Nurse 10-20 hours per week Average ancillary staff wage- \$20 (\$17-\$22/hour) | \$1,600.00 |
| Insurance Reimbursement Average per visit New Patient Visit (85% of physician coverage) | \$185.96 |

Future State Monthly Operation Costs

Total Operating Income

| | | |
|---|------------|--------------|
| Operational Costs for APP and Ancillary Coverage | | (\$6,433.33) |
| Patient Insurance Reimbursement | | |
| 20 patients | \$3,719.20 | (\$2,714.13) |
| 24 patients | \$4,463.04 | (\$1,970.29) |
| 30 patients | \$5,578.80 | (\$854.53) |
| 36 patients | \$6,694.56 | \$261.23 |

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World Health Organization [WHO] (2022). *Cancer*. https://www.who.int/health-topics/cancer#tab=tab_1

World Health Organization (2020). *WHO report on cancer: setting priorities, investing wisely and providing care for all*. Geneva.

Development of an Advanced Practice Provider Diagnostic Clinic within an Oncology Practice



Abigail Voss
DNP Project Final Defense
March 30, 2023

Acknowledgements

- Advisory Team
 - Dr. Anne McKay DNP, ANP-BC
 - Dr. Kellie Riley DNP, FNP-BC
 - Dr. Tanya Rowerdink DNP, RN, NP-C, CCD

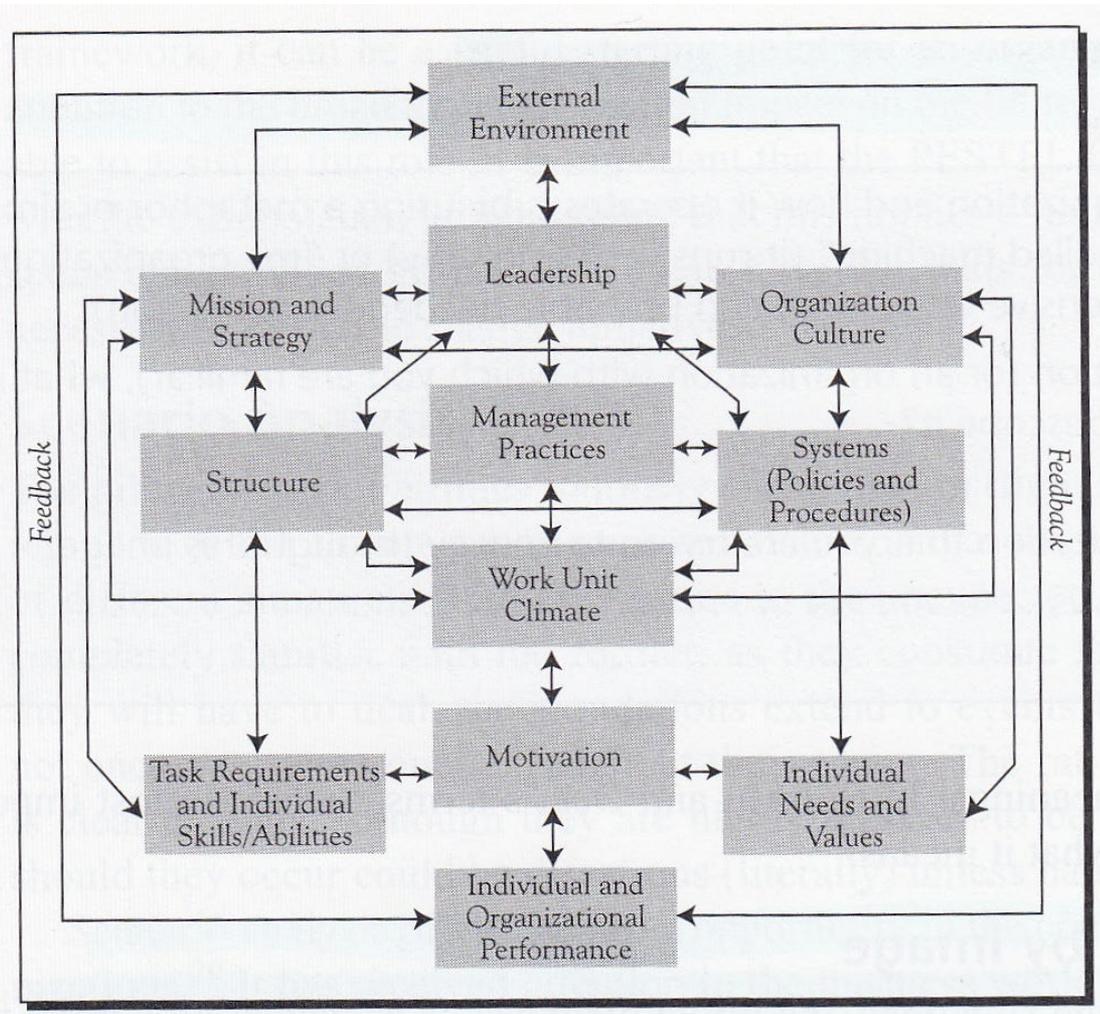
Objectives for Presentation

1. Review the clinical problem, organizational assessment, and the literature review findings.
2. Review models and frameworks used to support the program development.
3. Review toolkit objectives, deliverables, measures, and next steps for the organization.
4. Review enactment of DNP Essentials.

Introduction

- Diagnosis of cancer at a later stage has been associated with poorer cancer outcomes, negative patient experiences, and decreased quality of life post-treatment (Pujadas Botey et al., 2020; Richards, 2009).
- Within the U.S., time to treatment for cancer has worsened with the complexity of the health system (Khorana et al., 2019).
- Increasingly complex oncologic imaging and pathology findings are associated with higher risks of diagnostic errors (Nass et al., 2018).
- Effective interventions for early diagnosis of cancer require a cohesive approach for referral, diagnosis, staging, and treatment beginning at the primary care level (WHO, 2020).

Assessment of the Organization: Burke & Litwin



Burke and Litwin's Model of Organizational Performance and Change (Burke & Litwin, 1992, p.528). Image used with permission by SAGE Publications Inc. Journals.

Key Stakeholders



SWOT Analysis

Strengths

- **Committed to improving patient experience and outcomes.**
- Dedicated to implementing current evidence-based practices.
- Support from nursing and medical directors to achieve quality improvement initiatives.
- **Seeks avenues to stay prominent within the community.**
- **Part of a well-established, multi-site healthcare organization.**
- Provider-led organization, strong physician presence in decision making.

Weaknesses

- **Electronic Medical Record (EMR) differs among local health care systems yet able to interface.**
- Limited resources and time to devote to program development.
- Previous limitability of community presence due to ongoing healthcare partnerships.

Opportunities

- **Opportunity for partnerships with local providers to assist in quicker diagnostic timing for cancer patients.**
- Opportunity to be involved in care with new patients earlier in their oncology journey.
- Provide community with additional healthcare resources.
- Acquire more patients for the organization.

Threats

- Uncertainty regarding insurance reimbursement for services.
- Reluctance of change or fear of mistakes from staff.
- Multiple competing organizations in the area.
- **Risk of costs being greater than fiscal success.**

IRB Approval



Date: October 28, 2022

To: Anne McKay
From: Office of Research Compliance & Integrity
Project Title: Development of an Advanced Practice Provider Intake Clinic within an Oncology Practice
Project Number: 23-074-H
Submission Type: IRB Research Determination Submission

Action: Not Research
Effective Date: October 28, 2022
Review Type: Administrative Review

Thank you for your submission of materials for your planned scholarly activity. It has been determined that this project does not meet the definition of research* according to current federal regulations. The project, therefore, does not require further review and approval by the IRB.

Scholarly activities that are not covered under the Code of Federal Regulations should not be described or referred to as "research" in materials to participants, sponsors or in dissemination of findings. While performing this project, you are expected to adhere to GVSU's code of conduct and any discipline-specific code of ethics.

A summary of the reviewed project and determination is as follows:

The purpose of the project is to address the gap of care between the referring provider and an oncology practice when developing a diagnosis of cancer in patients who present with vague, nonspecific symptoms. This project is intended to create a plan for a single physician, not a generalizable plan for use in an oncology practice. Because this project is designed to improve care to patients and not designed to create new generalizable knowledge, it does not meet the federal definition of research. IRB oversight is not needed.

This determination letter is limited to IRB review. It is your responsibility to ensure all necessary institutional permissions are obtained prior to beginning this project. This includes, but is not limited to, ensuring all contracts have been executed, any necessary Data Sharing Agreements and Material Transfer Agreements have been signed, and any other outstanding items are completed.

If you have any questions, please contact the Office of Research Compliance and Integrity at (616) 331-3197 or rci@gvsu.edu. Please include the project title and project number in all correspondence with our office.

*Research is a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge (45 CFR 46.102 (d)).

Office of Research Compliance and Integrity | 1 Campus Drive | 049 James H Zumberge Hall | Allendale, MI 49401
Ph 616.331.3197 | rci@gvsu.edu | www.gvsu.edu/rci

Clinical Practice Question

- What is an evidence-based, APP-led diagnostic clinic model that is feasible and enhances care delivery within an oncology practice?

Available Knowledge: Aims

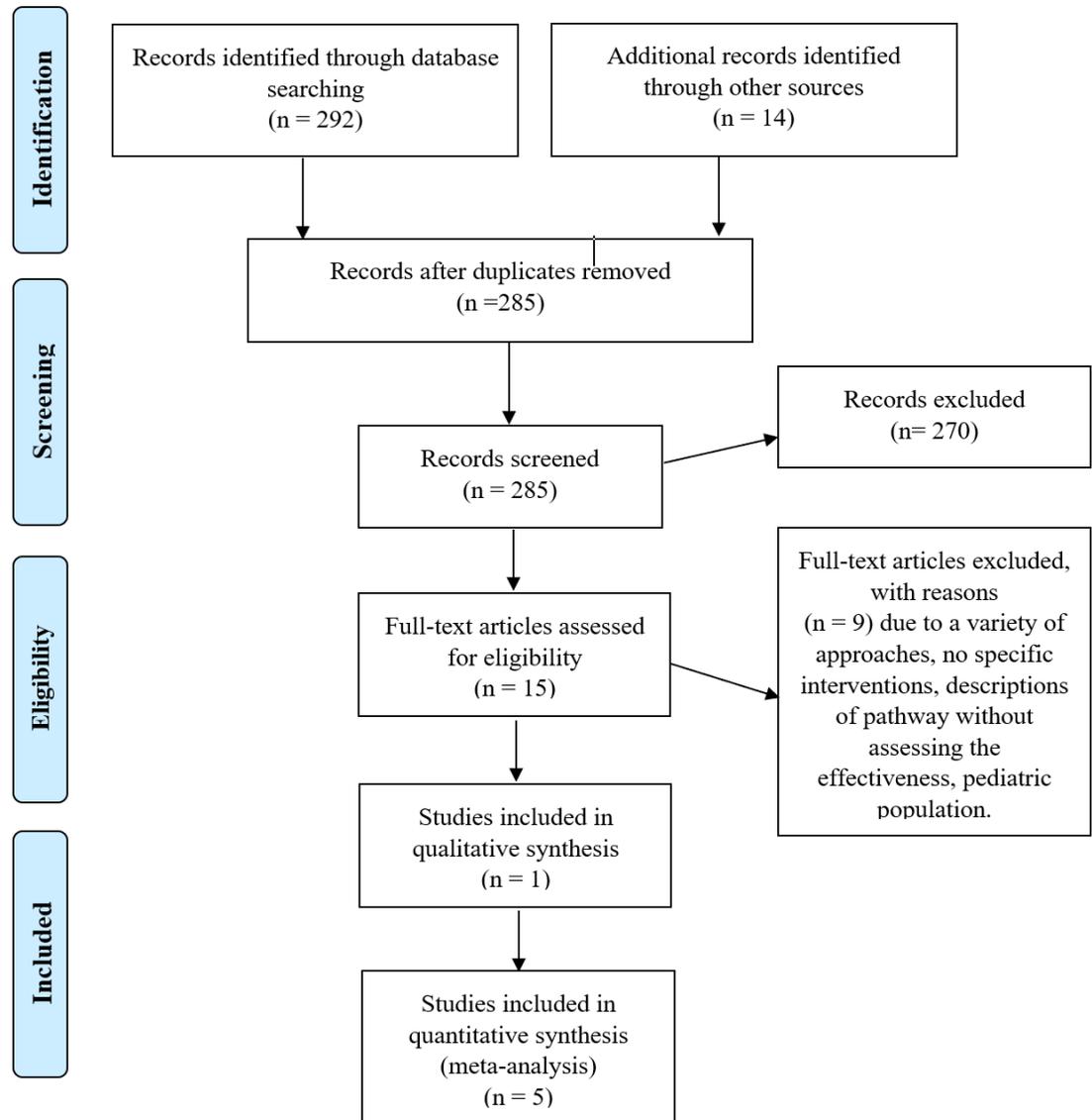
- What are the evidence-based interventions to decrease diagnostic timing?
- Which quality metrics should be measured?
- What is the potential cost effectiveness?

PRISMA

Figure

(Moher et al., (2009))

- Comprehensive electronic search of CINAHL, PubMed, and Google Scholar.
- Six articles met criteria and were included.



Synthesis of Results

Theme: Diagnostic Tools Utilized

| Literature Synthesis | Citation |
|--|--|
| Blood tests, chest radiograph, and abdominal ultrasound | Dolly et al., 2021; Ingeman et al., 2015; Sewell et al., 2020; Stenman et al., 2019; Vasilakis & Forte, 2021 |
| A comprehensive assessment of symptoms, co-morbidities, poly-pharmacy, risk factors, mental health, nutritional status, and cognitive status | Dolly et al., 2021 |
| CT scans (71% of patients), endoscopy, and biopsy | Dolly et al., 2021 |

Synthesis of Results

Theme: Quality Metrics

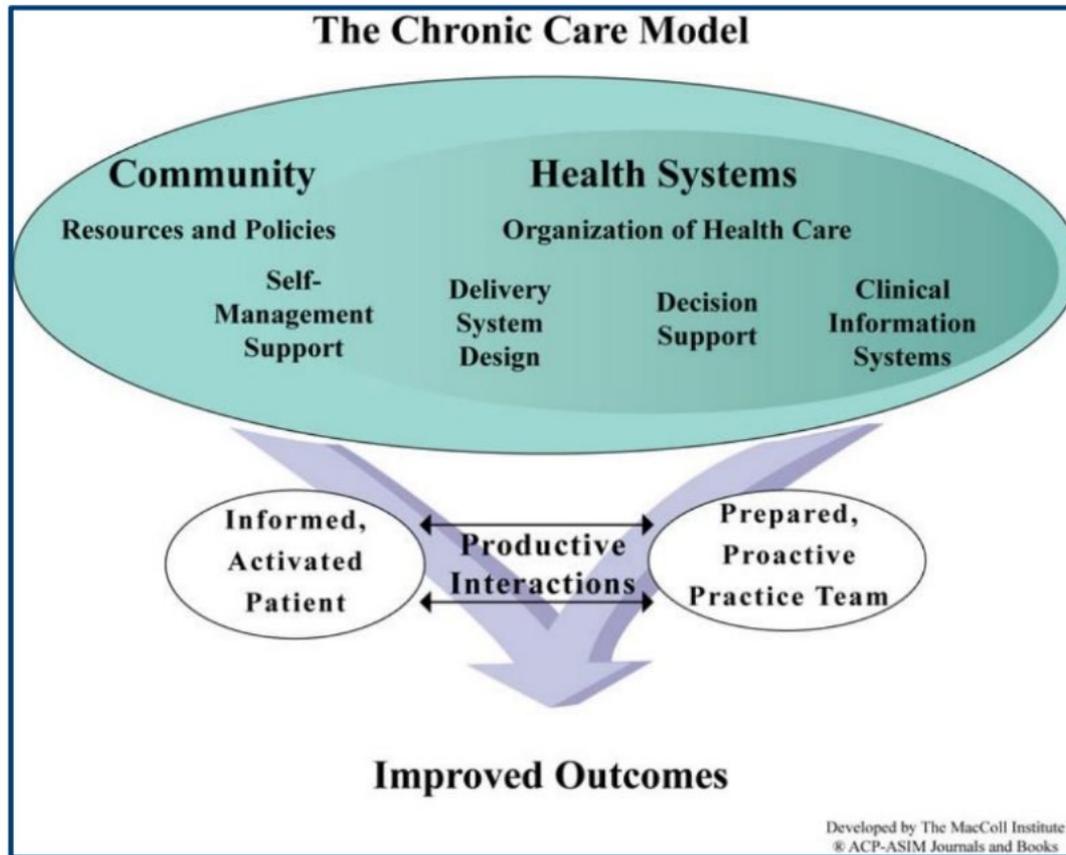
| Literature Synthesis | Citation |
|--|--|
| Percentage of patients who participated in the intake clinic and were subsequently diagnosed with cancer | Dolly et al., 2021; Ingeman et al., 2015; Martinez et al., 2021; Sewell et al., 2020; Stenman et al., 2019; Vasilakis & Forte, 2021 |
| Median time from primary care referral to cancer diagnosis | |
| Time to treatment was reduced compared to pre-intervention results | Dolly et al., 2021; Martinez et al., 2021 |
| Patients and providers provided positive satisfaction reviews | Stenman et al., 2019; Vasilakis & Forte, 2021 |

Synthesis of Results

Theme: Cost Effectiveness of Intake Clinic

| Literature Synthesis | Citation |
|--|-----------------------|
| 33% of patients diagnosed with cancer were detected at stage I-II | Dolly et al., 2021 |
| Pre-malignant conditions diagnosed in 6% of patients | Dolly et al., 2021 |
| At near or full capacity, the diagnostic clinics outperform standard clinical practice | Sewell et al., 2020 |
| Intake clinic assists in shortening diagnostic times and in ruling out cancer which can be highly relieving for patients | Martinez et al., 2021 |

Conceptual Model for Phenomenon



Wagner's Chronic Care Model (1998)

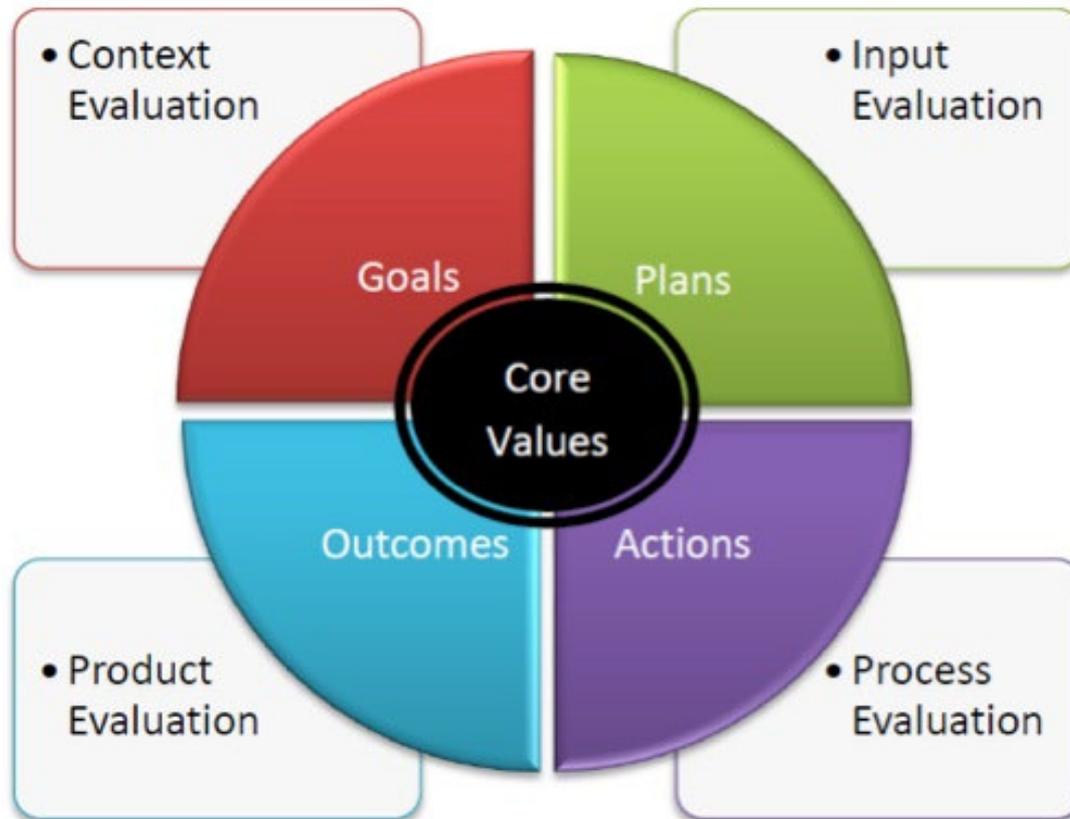
Image used with permission by American College of Physicians (ACP).

PROJECT PLAN

Purpose and Project Type

- **Program Development:** Design an evidence-based toolkit for an APP-led diagnostic clinic in an established, outpatient multidisciplinary oncology practice to decrease diagnostic timing.
 - **Deliverables:** Program Development Toolkit including: Program plan/timeline, business model, program evaluation, and sustainability plan

Implementation Framework



*Stufflebeam's (1983) Context, Input, Process, Product (CIPP) Evaluation Model
Image used with permission by Springer Nature.*

Project Design

- Three major components
 - Quality Monitoring
 - Fiscal Responsibility
 - Quality Care Delivery
- Each project objective is met by the toolkit deliverables.
- All deliverables and objectives are aligned with one of the three major components.

Objectives & Implementation Strategies

| Objectives | Implementation Strategy (Powell et al., 2015) |
|---|--|
| 1. Obtain IRB approval from GVSU. | Develop academic partnerships |
| 2. Identify optimal provider participation, relevant E&M codes, and define costs with stakeholders. | Make billing easier Use other payment schemes |
| 3. Perform retrospective data collection regarding new patient testing. | Tailor strategies |
| 4. Construct program timeline and build evaluation measures to utilize post-implementation. | Purposely reexamine the implementation |

Objectives & Implementation Strategies

| Objectives | Implementation Strategy (Powell et al., 2015) |
|---|--|
| 5. Create business model including optimal reimbursement plan. | Tailor strategies |
| 6. Build proposed sustainability plan. | Tailor strategies |
| 7. Present standardized business toolkit to Chief Clinical Operations Officer and Director of Operations. | Inform local opinion leaders |
| 8. Presentation of final defense. | Develop academic partnerships |

Measure and Analysis of Toolkit

| Deliverables | Measure/Analysis |
|-----------------------|--|
| Program plan/timeline | Outline steps of implementation and providing a feasible timeline. |
| Business model | Verify costs of implementation, identify reimbursement plan, and provide results to key organizational stakeholders. |
| Intake Flow | Create worksheet regarding flow of work starting with new referrals. |
| Program evaluation | Provide attainable quality measurements and retrospective de-identified data via Excel spreadsheet. |
| Sustainability plan | Recommendations and strategies for post-implementation provided to key stakeholders. |

Evaluation & Measures

- Perform pre-implementation data audit
 - Time from referral to first visit
 - Time from first visit to treatment
 - Record three months prior to implementation
- Include post-implementation evaluation recommendations
 - Suggest three month post-implementation interval

Proposed Budget & Resources

- Time values based on average salaries in the area for similar positions (Salary.com, 2022).

- Equipment provided via in-kind donations by the student.

| | |
|---|------------------|
| Revenue | \$18,364 |
| Project Manager Time (in-kind donation) <i>\$46/hour x 300 hours</i> | \$13,800 |
| Site Mentor Time- Director of Operations <i>(\$72/hour x 1.65 overhead) x 30 hours</i> | \$3,564 |
| Equipment (in-kind donation from student) <i>Student Laptop - \$1,000</i> | \$1,000 |
| Expenses | -\$18,364 |
| Project Manager Time (in-kind donation) <i>\$46/hour x 300 hours</i> | \$13,800 |
| Site Mentor Time- Director of Operations <i>(\$72/hour x 1.65 overhead) x 30 hours</i> | \$3,564 |
| Equipment (in-kind donation from student) <i>Student Laptop - \$1,000</i> | \$1,000 |
| Net Operating Plan | \$0 |

Timeline

| November 15, 2022 | December 15, 2022 | January 15, 2023 | February 15, 2023 | March, 2023 |
|--|---|--|--|---|
| <ul style="list-style-type: none">• Obtain IRB approval• Identify relevant E&M codes and define costs with key stakeholders | <ul style="list-style-type: none">• Perform retrospective data collection regarding new patient testing | <ul style="list-style-type: none">• Construct program timeline and evaluation measures | <ul style="list-style-type: none">• Create business model• Build proposed sustainability plan | <ul style="list-style-type: none">• Present standardized business toolkit to stakeholders• Presentation of final defense |

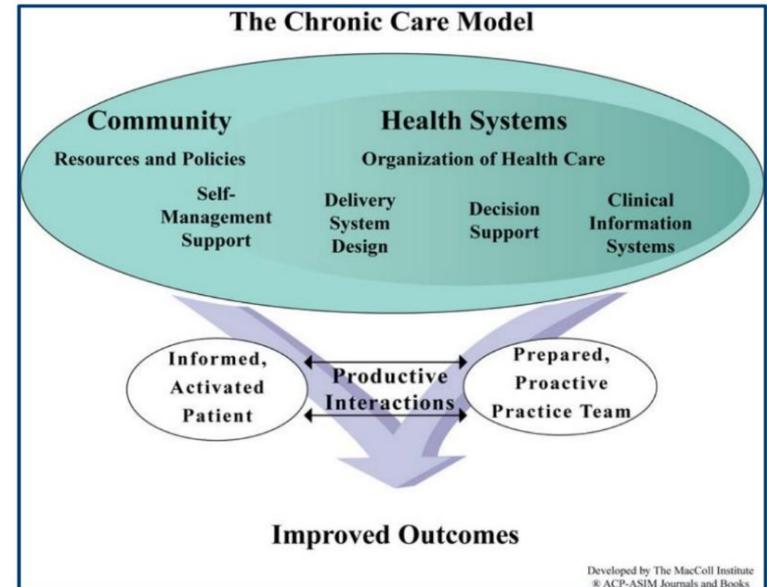


RESULTS

Deliverables Aligned with Frameworks



Stufflebeam's Context, Input, Process, Product (CIPP) Evaluation Model (1983)



Wagner's Chronic Care Model (1998)

Deliverable Table of Contents

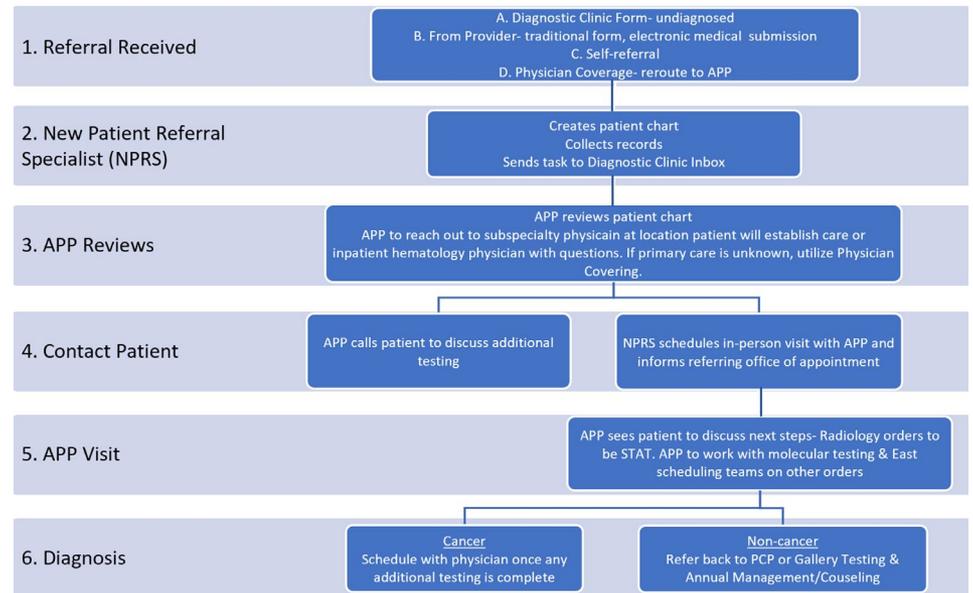
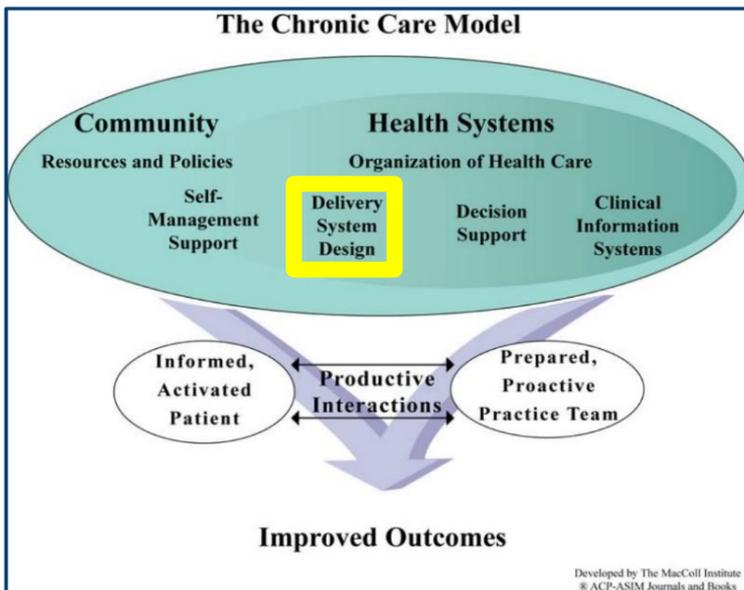
| Theme | Deliverable | Alignment with CIPP (Stufflebeam et al., 1983) | Characteristics/ Target |
|--------------------|---|---|---|
| Quality Monitoring | Three month pre-implementation data regarding overall time to treatment | Context Evaluation (Goals): provide background data to evaluate effectiveness post-implementation | <ul style="list-style-type: none"> - Tailored program evaluation - Guide for standardized data collection |
| | | CCM: Delivery System Design (Wagner, 1998) | |
| | Proposed program evaluation for three month post-implementation | Input Evaluation (Plans), Product Evaluation (Outcomes): reflect what the implementation will look like and create plan for sustainability and adjustment | <ul style="list-style-type: none"> -Tailored program evaluation -Guide for standardized data collection |
| | Patient satisfaction survey concerning Diagnostic Clinic | Process Evaluation(Outcomes): encompass the impact and effectiveness | -Patients |
| | | CCM: Informed, Activated Patient (Wagner, 1998) | |
| | Staff feedback form regarding Diagnostic Clinic workflow | Process Evaluation (Outcomes): encompass the impact and effectiveness | <ul style="list-style-type: none"> -Staff directly (NPRS, scheduler, APP) and indirectly (physician, ancillary staff) involved |
| | | CCM: Prepared, Proactive, Practice Team (Wagner, 1998) | |

Deliverable Table of Contents (Continued)

| Theme | Deliverable | Alignment with CIPP (Stufflebeam et al., 1983) | Characteristics/ Target |
|------------------------------|--|---|---|
| Fiscal Responsibility | Business Model encompassing financial analysis, limitations, and forecasted improvements | Input Evaluation (Plans), Process Evaluation (Actions): reflect the budget, plan what implementation will cost | -Organizational stakeholders including directors |
| | | CCM: Delivery System Design (Wagner, 1998) | |
| Quality Care Delivery | Program timeline detailing scheduled goals | Input Evaluation (Plans): plan what implementation will look like | -Organizational stakeholders including directors -Staff directly involved (NPRS, scheduler, APP) -Staff indirectly involved (ancillary staff) |
| | Diagnostic Clinic Intake Flow displaying flowchart of intake process | Process Evaluation (Actions): develop toolkit and workflow process CCM: Delivery System Design (Wagner, 1998) | |
| | Sustainability plan containing future strategies for Diagnostic Clinic post-implementation | Input Evaluation (Plans), Product Evaluation (Outcomes): reflect what the implementation will look like and create plan for sustainability and adjustment | -Tailored program evaluation -Guide for standardized data collection |

Deliverables: Intake Flowsheet

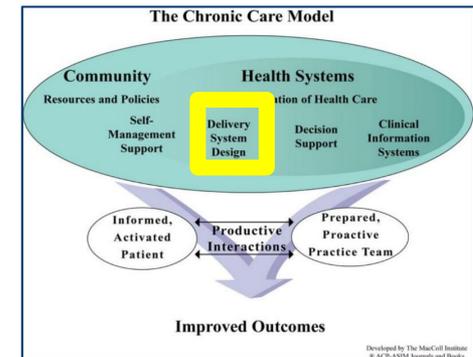
- Describe process and roles for staff involved with new patient referrals for the Diagnostic Clinic



Deliverables: Pre-Implementation Data

- Audit three months
- Provide background data to evaluate effectiveness post-implementation
- Tailored program evaluation
- Guide for standardized data collection

| Quality Metrics | Pre-Implementation Data | Post-Implementation Data |
|---|-------------------------|--------------------------|
| Average days from referral to new patient visit | 7.588 | |
| Average days from new patient visit to start of treatment | 19.94 | |
| Percent of new patient visits requiring physician to order radiology studies | 37% | |
| Percentage of new patient visits requiring physician to order molecular tests | 29% | |



Deliverables: Program Evaluation Plan

Quality Measures

Compare 3 month pre-implementation and 3 month post-implementation data.

- Utilize provided Excel spreadsheet for post-implementation data.
- Audit data regarding time from referral to first visit.
- Audit data regarding time from provider visit to treatment.
- Audit data regarding attending physician ordering molecular or radiology testing for newly diagnosed patients from the diagnostic clinic.
- Track operational growth metrics including volume, diagnoses, and clinic location.

- Tailored program evaluation
- Guide for standardized data collection
- Reflect what the implementation will look like and create plan for sustainability and adjustment



Deliverables: Program Evaluation Plan- Operational & Growth Metrics

| DC Visit Date | Time from Referral | In-Person/ Virtual | Cancer Y/N | Diagnosis | Time to Treatment | Clinic Location/ Provider |
|---------------|--------------------|-----------------------|------------|----------------|-------------------|------------------------------|
| 1/16/23 | 3 days | In-person | Y | Lymphoma | 12 days | |
| 1/20/23 | 2 days | Virtual | Y | Pending | Pending | |
| 1/23/23 | 3 days | In-person | Y | Lung Cancer | Pending | |
| 1/23/23 | 3 days | In-person | Pending | Pending | Pending | |
| 1/23/23 | 5 days | In-person | Pending | Pending | Pending | |

- Guide for standardized data collection
- Create adjustments needed based on evaluation plan
- Assist in planning for sustainability

Deliverables: Patient Survey

Patient Satisfaction Survey

Suggested Staff Script:

After recently starting the Diagnostic Clinic, we are seeking feedback from patients regarding their experience with the clinic. Are you interested in participating a quick survey? It takes only a few minutes and provides information to improve future patient experience and practice. I will read through the question to which you may respond with "strongly disagree, disagree, neutral, agree, or strongly agree".

1. I was able to be seen in a timely manner at the Diagnostic Clinic.

Strongly Disagree Disagree Neutral Agree Strongly Agree

2. The Diagnostic Clinic was able to answer my questions and concerns appropriately.

Strongly Disagree Disagree Neutral Agree Strongly Agree

3. The Diagnostic Clinic provided appropriate updates to me throughout the process.

Strongly Disagree Disagree Neutral Agree Strongly Agree

4. The Diagnostic Clinic provided appropriate updates to my primary care provider throughout the process.

Strongly Disagree Disagree Neutral Agree Strongly Agree

5. I felt reassured the Diagnostic Clinic was knowledgeable regarding my plan of care.

Strongly Disagree Disagree Neutral Agree Strongly Agree

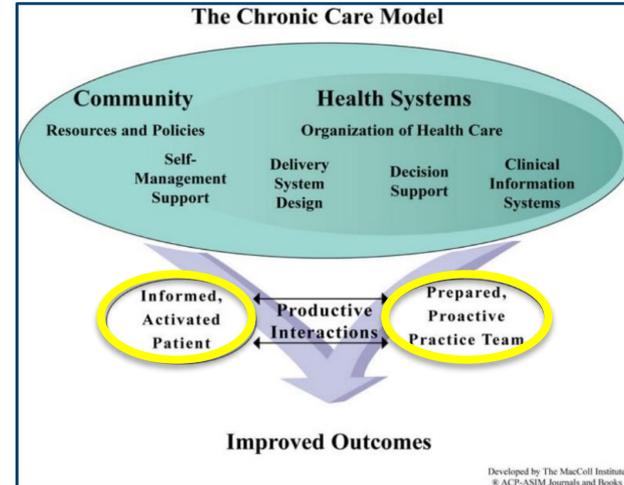
6. The Diagnostic Clinic was able to coordinate tests in a timely manner with health partners such as the radiology or interventional radiology departments.

Strongly Disagree Disagree Neutral Agree Strongly Agree

7. I would recommend the Diagnostic Clinic to others if they have concern for cancer.

Strongly Disagree Disagree Neutral Agree Strongly Agree

- Target patients and staff directly/indirectly involved
- Encompass the impact and effectiveness



Deliverables: Staff Feedback

Staff Feedback Forms

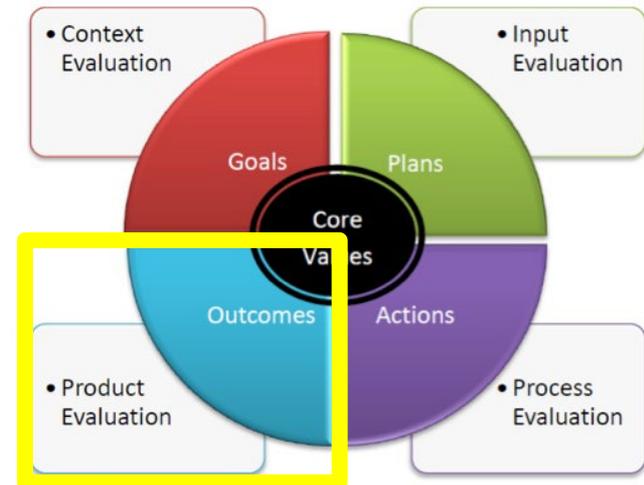
Staff Involved Feedback

1. What has gone well with the Diagnostic Clinic?
2. What barriers do you encounter when performing your role for the Diagnostic Clinic?
3. Do you feel you have the appropriate resources to complete your role?
4. If no, what resources would benefit your role related to the Diagnostic Clinic?
5. What changes would you suggest for the development of the Diagnostic Clinic?

Indirect Staff Feedback

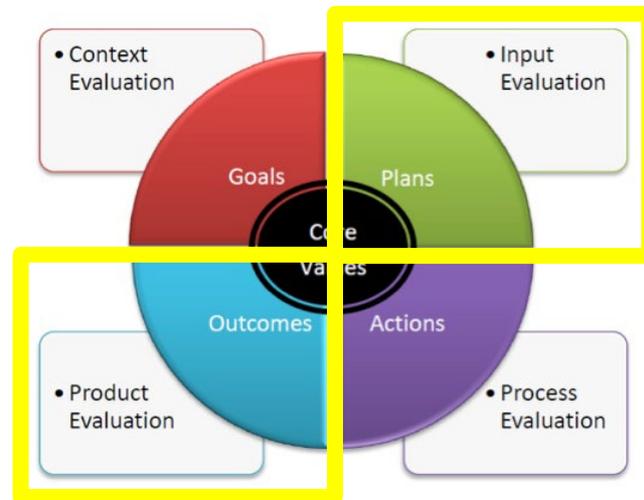
1. How has the Diagnostic Clinic affected your work?
2. Have you routed a patient to the Diagnostic Clinic? If yes, did you experience any difficulties in the process?
3. Have you received a patient from the Diagnostic Clinic? If yes, were appropriate tests completed prior to seeing the patient?
4. What changes would you suggest for the development of the Diagnostic Clinic?

- Target patients and staff directly/indirectly involved
- Encompass the impact and effectiveness



Deliverables: Sustainability Recommendations

| | | | |
|------------------------------|--|---|---|
| Quality Care Delivery | Sustainability plan containing future strategies for Diagnostic Clinic post-implementation | Input Evaluation (Plans), Product Evaluation (Outcomes): reflect what the implementation will look like and create plan for sustainability and adjustment | -Tailored program evaluation -Guide for standardized data collection |
|------------------------------|--|---|---|



Deliverables: Business Plan

Components

- Assigned Costs and Assumptions
- Limitations
- Operational Costs
- Future State Assumptions
- Future State Operational Costs

CIPP (Stufflebeam et al., 1983)

- Input Evaluation (Plans)
- Process Evaluation (Actions)
- Reflect the budget, plan what implementation will cost

CCM (Wagner, 1998)

- Delivery System Design



Forecasted Outcomes

Forecasted Improvement Outcomes

Improved patient and referring provider satisfaction

- [Stenman et al., 2019](#); [Vasilakis & Forte, 2021](#)
-

Decreased time from referral to new patient provider visit

- Average for the organization is 7.58 days
 - Aim to decrease for a maximum wait of 2 days (decrease of approximately 73%)
-

Decreased time from attending physician visit to start of treatment

- Average for the organization is 19.94 days
 - Aim to decrease for a maximum wait of 14 days (decrease of approximately 30%)
-

Decreased diagnostic time

- [Dolly et al., 2021](#); [Ingeman et al., 2015](#); [Martinez et al., 2021](#); [Sewell et al., 2020](#); [Stenman et al., 2019](#); [Vasilakis & Forte, 2021](#)
-

Assumptions

- Insurance Reimbursement Average is based on 3 most common insurance companies provided by the organization
- E/M Coding most commonly to be utilized is 99205: New Patient, level 5
- APP's receive 85% of physician reimbursement
- All salaries estimated using online tool (Salary.com, 2020).

Assumptions

| | |
|---|----------|
| Advanced Practice Provider Coverage per month | \$2,900 |
| 12 hours per week (30% of time) | |
| Local APP salary- \$116, 000 | |
| Ancillary Staff Coverage | \$816 |
| New Patient Referral Specialist, Medical Assistant, Scheduler | |
| 12 hours per week | |
| Average ancillary staff wage- \$17/hour | |
| Insurance Reimbursement Average per visit | \$185.96 |
| New Patient Visit (85% of physician coverage) | |

Operational Costs

Monthly Operation Costs

Total Operating Income

| <i>APP and Ancillary Coverage</i> | | (\$3,716) |
|--|------------|------------------|
| <i>Patient Insurance Reimbursement</i> | | |
| <i>4 patients</i> | \$743.84 | (\$2,975.16) |
| <i>8 patients</i> | \$1,487.68 | (\$2,228.32) |
| <i>12 patients</i> | \$2,231.52 | (\$1,484.48) |
| <i>16 patients</i> | \$2,975.36 | (\$740.64) |
| <i>20 patients</i> | \$3,719.20 | \$3.20 |
| <i>24 patients</i> | \$4,463.04 | \$747.04 |

Future State Operational Costs

Future State Assumptions

| | |
|--|------------|
| Advanced Practice Provider Coverage per month 20 hours per week (50% of time) Local APP salary- \$116, 000 | \$4,833.33 |
| Ancillary Staff Coverage New Patient Referral Specialist, <u>Licensed Practice Nurse</u> 10-20 hours per week Average ancillary staff wage- \$20 (\$17-\$22/hour) | \$1,600.00 |
| Insurance Reimbursement Average per visit New Patient Visit (85% of physician coverage) | \$185.96 |

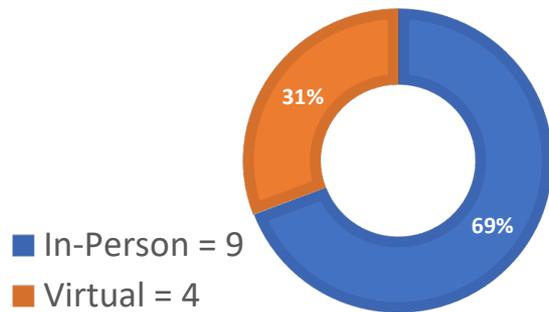
Future State Monthly Operation Costs

Total Operating Income

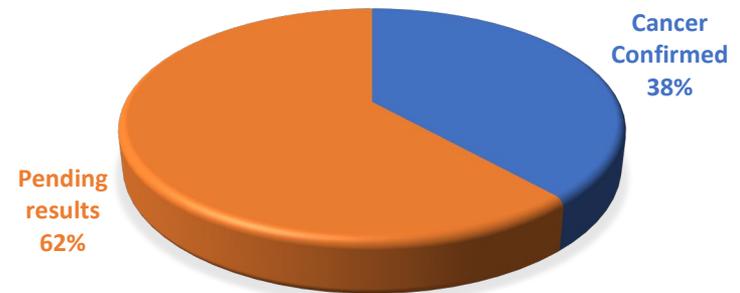
| | | |
|---|------------|--------------|
| Operational Costs for APP and Ancillary Coverage | | (\$6,433.33) |
| Patient Insurance Reimbursement | | |
| 20 patients | \$3,719.20 | (\$2,714.13) |
| 24 patients | \$4,463.04 | (\$1,970.29) |
| 30 patients | \$5,578.80 | (\$854.53) |
| 36 patients | \$6,694.56 | \$261.23 |

Preliminary Post-Implementation Audit

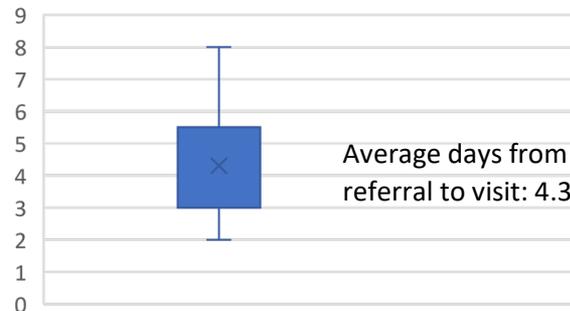
FIRST MONTH DIAGNOSTIC CLINIC PATIENTS



DIAGNOSTIC CLINIC RESULTS



Time from Referral to Diagnostic Clinic Visit

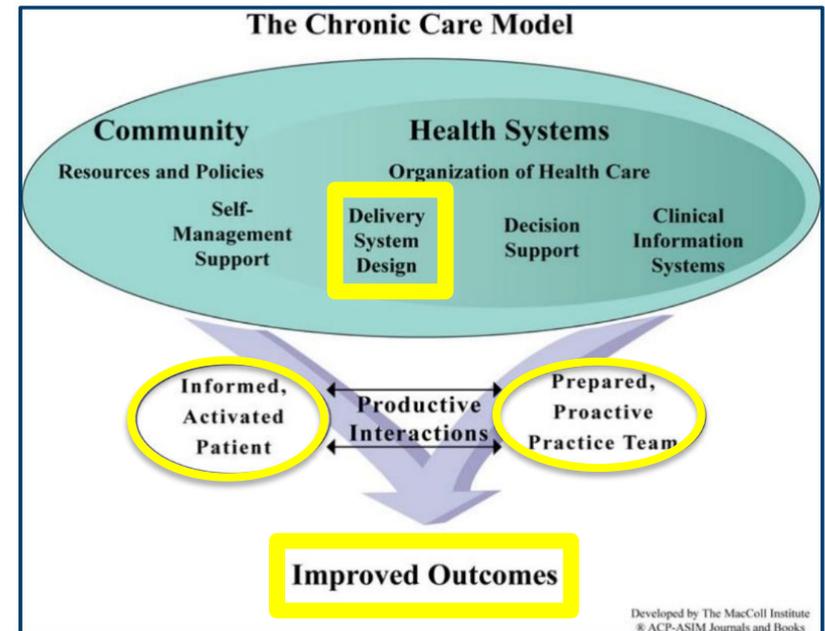


Preliminary Post-Implementation Audit

| Quality Metrics | Pre-Implementation Data | Post-Implementation Data |
|---|-------------------------|--------------------------|
| Average days from referral to new patient visit | 7.588 | 4.3 |
| Average days from new patient visit to start of treatment | 19.94 | Pending |
| Percent of new patient visits requiring physician to order radiology studies | 37% | Pending |
| Percentage of new patient visits requiring physician to order molecular tests | 29% | Pending |

Discussion: Guiding Frameworks

- **CIPP** (Stufflebeam et al., 1983)
 - Tailored for program development/evaluation
- **CCM** (Wagner, 1998)
 - Highlight fundamental elements required for patients with chronic disease care
 - Diagnostic Clinic aims for change to the delivery system design in order to produce informed, activated patients and prepared, proactive teams for improved outcomes



Implications for Practice

- Potential for improved patient and provider satisfaction
 - Help organization justify costs of program
 - Potential for increased number of referrals
- Decreased time from referral to initial visit
- Limitations: ongoing
 - Patient and provider satisfaction is not currently quantifiable

Sustainability Plan

- Ongoing focus from organizational leaders
- Ongoing evaluation processes
- Examine if the referrals are evenly distributed between self-referral, primary care, or in-hospital
- Ensure the liaison continues disseminating information to community providers
- Engage and maintain active APP position dedicated to the role of the diagnostic clinic.

Conclusions

An established outpatient oncology practice identified the need to address the gap of care between the referring provider and organization when developing a diagnosis of cancer in patients who present with vague, nonspecific symptoms.

Clinical Question: What is an evidence-based, APP-led intake clinic model that is feasible and enhances care delivery within an oncology practice?

Outcome: Program development of a Diagnostic Clinic based on evidence-based interventions focusing on quality measures including patient and provider satisfaction.

Dissemination

- Final defense at **GVSU**
- Deliver to organizational stakeholders
 - Director of Operations
- Upload into Scholar Works
- Potential manuscript submission

DNP Essentials Reflection

| | |
|-----------------------|--|
| Essential I | Scientific Underpinnings for Practice |
| Essential II | Organizational and System Leadership for Quality Improvement and Systems Thinking |
| Essential III | Clinical Scholarship and Analytical Methods for Evidence-Based Practice |
| Essential IV | Information Systems/Technology and Patient Care Technology for Improvement and Transformation of Health Care |
| Essential V | Health Care Policy for Advocacy in Health Care |
| Essential VI | Interprofessional Collaboration for Improving Patient and Population Health Outcomes |
| Essential VII | Clinical Prevention and Population Health for Improving the Nation's Health |
| Essential VIII | Advanced Nursing Practice |

(American Association of Colleges of Nursing, 2006)

DNP Essentials Reflection

| | |
|-----------------------|--|
| Essential I | Use of phenomenon framework (CCM) and thorough literature review to provide insight, understanding, and guide to select evidence-based interventions |
| Essential II | Project demonstrates sensitivity to the affected population and feasibility within the organization |
| Essential VI | Effective communication and collaborative skills were developed throughout the implementation of the DNP Project |
| Essential VII | Evaluated the current care delivery and determined appropriate evidence-based methods for community improvement |
| Essential VIII | Advanced clinical and leadership judgement and knowledge in a complex situation to improved patient outcomes and the healthcare system |

(American Association of Colleges of Nursing, 2006)

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Discussion:

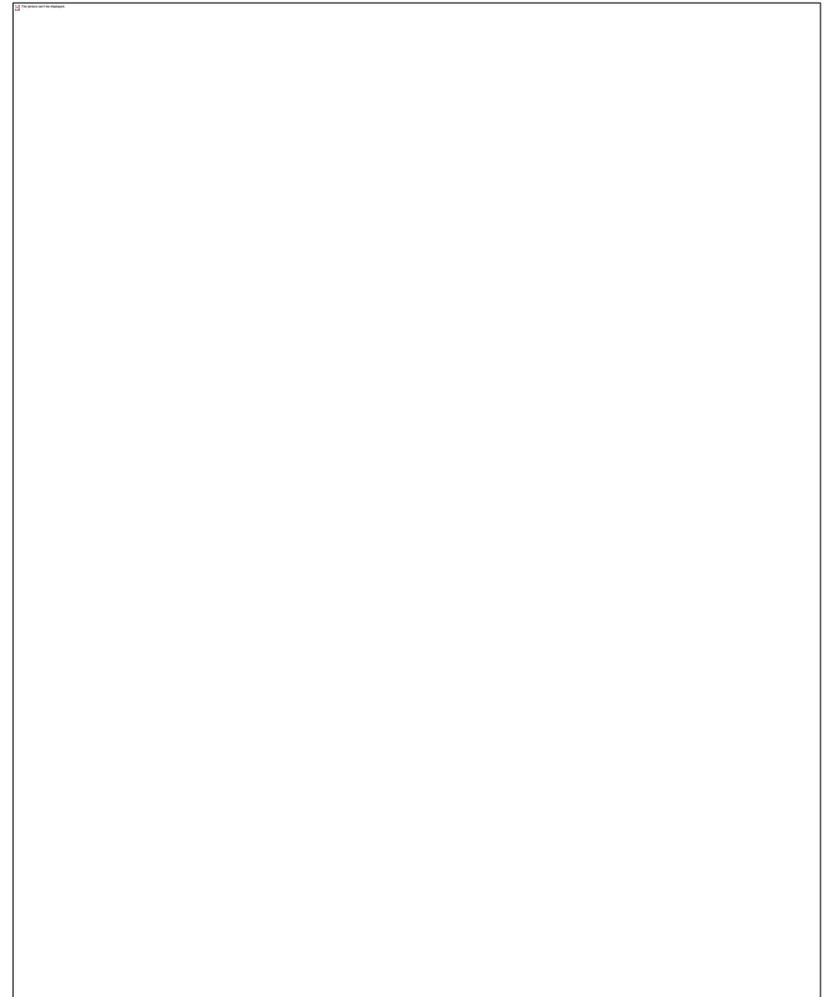
Questions?

Improving Breastfeeding Rates in a Rural and Medically Underserved Community

Kaylie Waters

DNP Project Final Defense

April 20, 2023



Acknowledgements

- Dr. Christina Quick, DNP, APRN, CPNP-AC/PC
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 - Project Site Mentor
- HRSA grant
- Presidential Research Grant

Objectives for Presentation

1. Present the clinical problem
2. Describe the phenomenon theory and implementation framework
3. Review implementation strategies
4. Discuss results and sustainability of project
5. Explore how Doctor of Nursing Practice (DNP) essentials were incorporated into the project

Introduction

- Why is breastfeeding important?
- What are the benefits?
- Why 6 months?
- Why do moms stop breastfeeding?



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(Cleveland Clinic, 2022; CDC, 2021; Busch et al., 2019; Meek & Noble, 2022)

Background

- 83% start breastfeeding nationally
- 58% vs. 16% at 6 months
- Why
 - Rural
 - Population
 - poverty

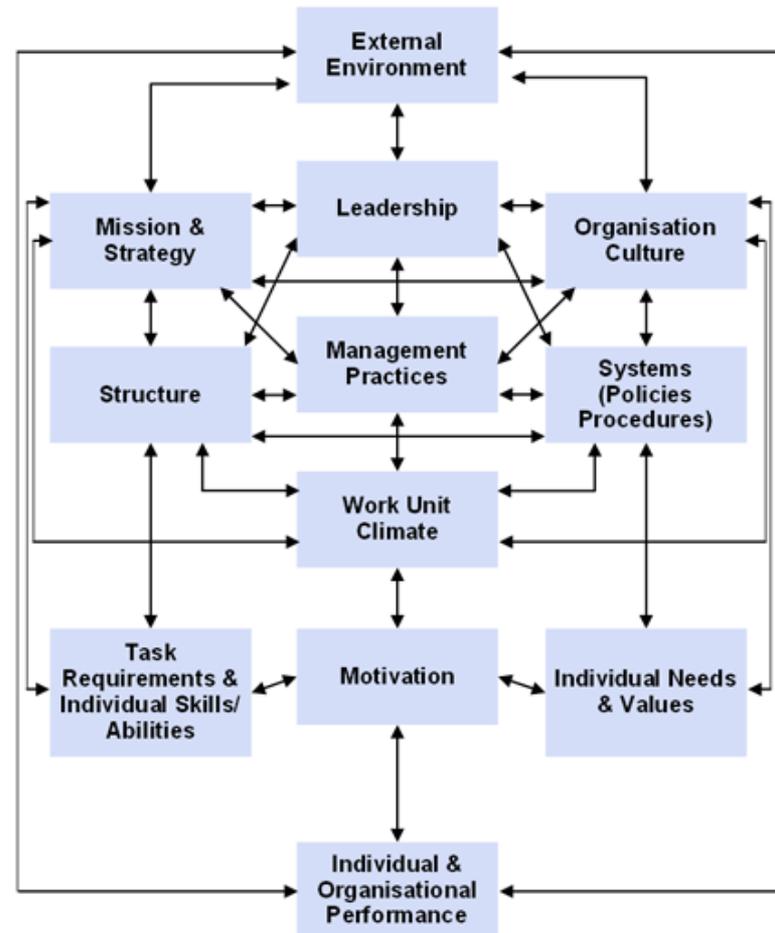


(CDC, 2020; MDHHS, 2021; USCB,2020)

ORGANIZATIONAL ASSESSMENT

Framework for Organizational Assessment

Burke-Litwin Model for Organizational Performance and Change (1992)



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SWOT Analysis

Strengths

- **Multiple providers** on site to provide interdisciplinary care
- **Good daily communication**
- Common goal promoting population health
- The office has integrated healthcare available on site.
- **Integrative high level electronic health record system.**
- **Bilingual staff.**

Weaknesses

- **Staff/provider shortages**
- Rural underserved community
- No lactation specialist in the practice
- **No standard practice for documenting/addressing breastfeeding and its challenges**
- **No breastfeeding education for staff or patients available.**

Opportunities

- Relationships with connected offices
- Relationships with community resources such as WIC
- Community support
- **Relationship with inpatient lactation consultants at associated larger hospital**

Threats

- COVID-recent pandemic taking away resources and revenue
- Lack of resources/transportation within the rural community
- Limited Lactation Specialists available within community

LITERATURE REVIEW

Available Knowledge

Purpose

The purpose of this review was to evaluate the literature to determine the most effective evidence-based interventions to improve breastfeeding rates in primary care.

Aims

1. For adult mothers with healthy term infants, will addressing and documenting breastfeeding status and challenges through individualized counseling compared to standard breastfeeding counseling have a positive effect on breastfeeding rates?
2. For adult mothers with healthy term infants, will the provision of formalized breastfeeding education to staff and providers compared to no education have a positive impact on breastfeeding rates?

PRISMA Figure

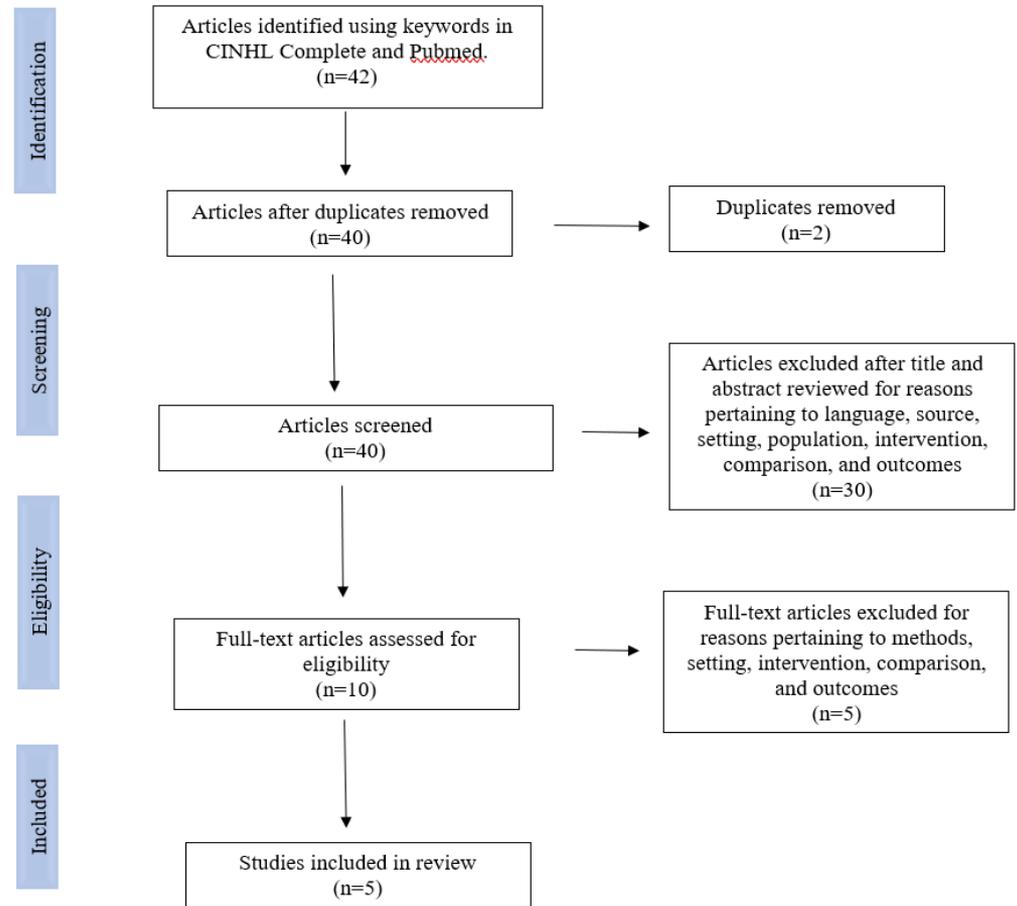


Figure. Flow diagram of search selection process. Adapted from “Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement,” by D. Moher, A. Liberati, J. Tetzlaff, D. Altman, and PRISMA Group. Copyright 2009 by *PLoS Medicine*.

Synthesis of Results

Documentation/Counseling

- Dumphy et al., (2016) found a positive relationship with breast feeding rates after implementing new policies for patient education and recording breastfeeding status.
- Significant increase in breastfeeding rates when counseling and support was continued postpartum by a healthcare professional (Kim et al., 2018)
- *Individual* support and education reported significantly higher likelihood of any and exclusive breastfeeding (Patnode et al., 2016)

Staff Education

- Training interventions led to significant difference in staff knowledge and attitudes towards breastfeeding (Rosen-Carole et al., 2016).
- Comprehensive staff training in breastfeeding showed a positive relationship with breastfeeding rates (Dumphy et al., 2016)
- Patients had increased self efficacy and higher breastfeeding rates after receiving counseling from a nurse with formal breastfeeding education (Bueno-Gutiérrez et al., 2021)

PROJECT PLAN

Theory for Phenomenon

Orem's Self-Care Theory Conceptual Framework



nurseslabs

(Gonzalo, 2021)

Clinical Practice Question

How will implementation of a standardized process of documenting breastfeeding status and challenges, formal breastfeeding education for staff, individualized breastfeeding counseling, and the use of visual graphics to promote breastfeeding impact breastfeeding rates of infants in a rural healthcare setting?

Purpose and Project Type

- **Quality Improvement Project**
- **Purpose**
 - **Improve Breastfeeding rates**
 - **Documentation of BF status/challenges**
 - **Staff education**
 - **Visual aides/graphics**
 - **Patient counseling and handouts**

Project Design

Quality Improvement

“a systematic and continuous process that leads to measurable improvement in healthcare services and the health status of targeted groups”

– Dr. Moran

Systematic

Data Driven

Evidence-Based

Improvement

Measurable

(Moran et al., 2019)

Methodology

Setting:

- Rural primary care office in the Midwest affiliated with a large healthcare system

Participants:

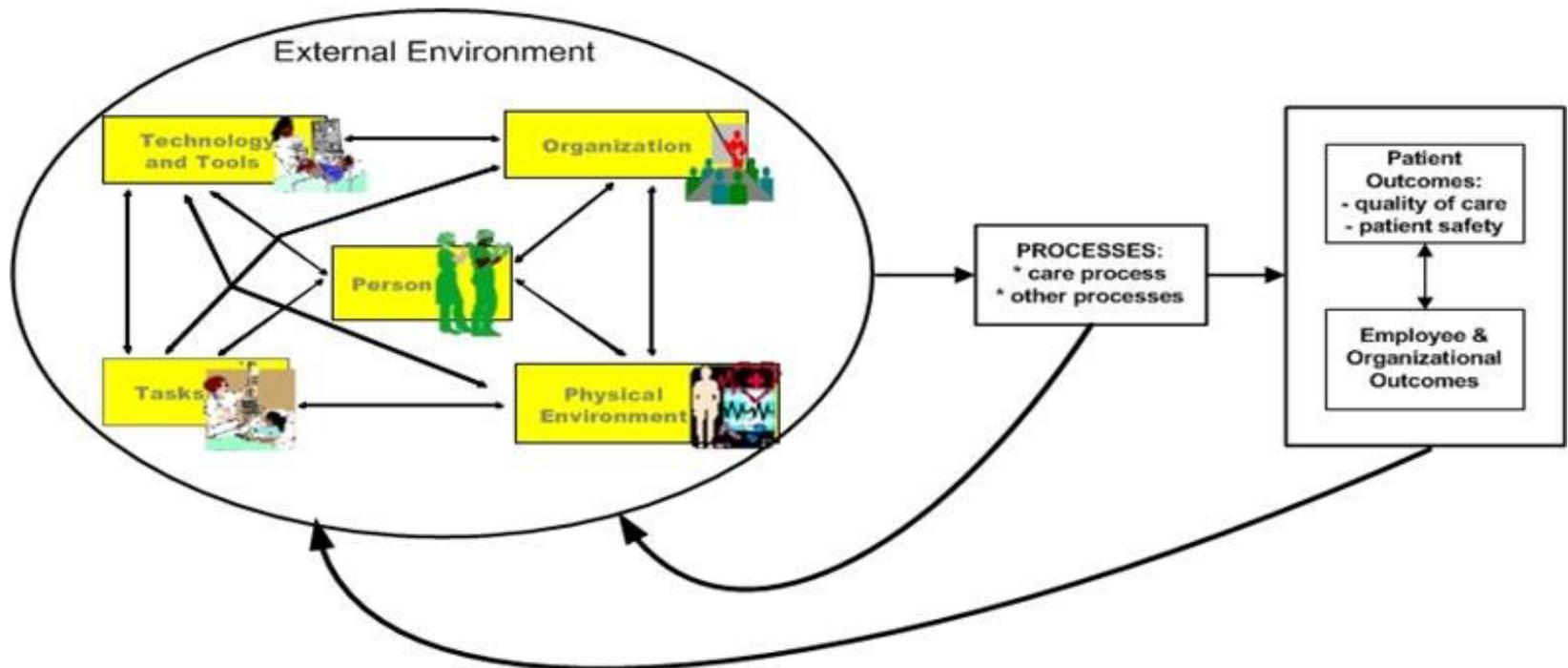
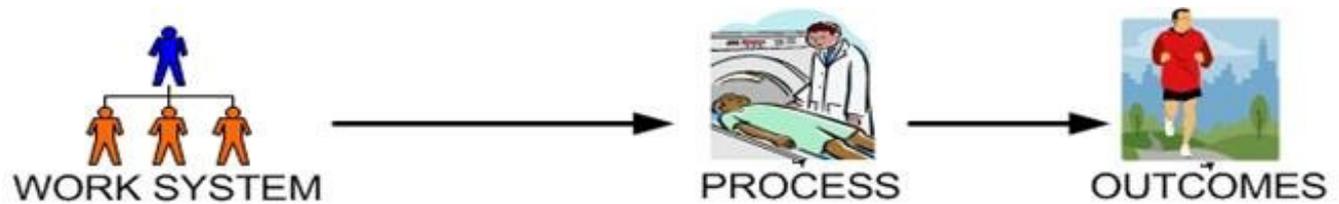
- Three physicians, one physician assistant, one nurse practitioner, 12 medical assistants, six clerical staff members, RN case manager, triage nurse, pharmacist, social worker, and a clinical administrator
- Patients and their families

Source of Data:

- Electronic health records



Implementation Framework



Systems Engineering Initiative for Patient Safety (Crayon et al., 2014).

Project Objectives

Objectives:

1. Present breastfeeding education and project information to providers on December 20, 2022.
2. Obtain IRB determination by January 13, 2022.
3. Collect pre-implementation data by January 16, 2022.
4. Place breastfeeding posters in lobby and patient rooms January 16, 2023
5. Ensure compiled patient education handouts are available to all staff on January 16, 2023
6. Begin office wide documentation process and individualized breastfeeding counseling aided by patient education handouts on January 16, 2023
7. Provide support and modifications as necessary from January 16- March 10, 2023
8. Collect post-implementation data March 13, 2023.
9. Present final defense and upload to Scholar Works on April 20, 2023.
10. Distribute project results to project site and providers.

Implementation Strategies & Elements

- Expert Recommendations for Implementing Change (ERIC)

| Implementation Strategy | Description | Framework and Theory Alignment |
|---|---|---|
| Access new funding | Received Presidential Research Grant | B & L: Systems Orem: Teaching, supporting, and environment SEIPS: Work system |
| Change physical structure and equipment | Posters placed in lobby and patient rooms | B & L: Systems Orem: Teaching, supporting, and environment SEIPS: Work system |

Breastfeeding Your Newborn

Your Newborn's Belly

A newborn's stomach is very small at birth and gradually expands. These visuals show a newborn's stomach size to scale.

Day 1
A brand new baby's belly is marble-sized and holds about 1/4 of an ounce or about 5 mL.

For the first few days, your breasts make milk called colostrum. Colostrum is thick and made in small amounts, perfect for baby's tiny belly.

Day 3

Baby's belly is ping-pong ball-sized and holds 3/4 to one ounce or about 25 mL.

As the volume of your milk increases, it becomes whiter and thinner. This is called transitional milk.

Day 10

Baby's belly is chicken egg-sized and holds 2 ounces or about 60 mL.

Mature milk is what your body makes after the first few weeks. It may look watery (especially at the beginning of a feeding) or creamy (near the end). Milk content changes frequently to meet baby's specific needs.

Getting Plenty of Milk

Feed your newborn at signs of hunger, at least 8-12 times per day. These signs will help you know that baby is getting enough milk.

Weight Gain

Newborns may lose 7-10 percent of their birthweight in the first few days. Following this initial drop, they should gain steadily, 5-7 ounces per week or more for the first month.

Diapers

At least 1 wet and 1 soiled diaper for each day of life (1 on day 1, 2 on day 2). By day 4, baby should have 6+ wet diapers and 3-4 stools or more per day.

Stool Changes

During the first few days, the color and consistency of stool changes. These changes let you know that baby is feeding well.



Day 1

Baby's stool is called meconium and is black/brown, thick and sticky.



Day 3

Transitional stool, which is greenish and less sticky than meconium.



Day 5

Baby's stool becomes mustard yellow and may be watery or seedy.



This information should not be construed as medical advice, nor is it intended to replace the individual care of a health care professional.

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Newborn Hunger Cues

There are a variety of ways that newborns communicate when they are hungry. Watching for these cues lets you know when your newborn is ready to be fed.



Early Cues

It is generally best to begin feeding as soon as you notice these early hunger cues. You can even begin when your baby is in a light sleep.

- Smacking lips or opening and closing mouth.
- Sucking on tongue, lips, hand or other objects.
- Rooting (turning their head and opening their mouth to anything touching near their mouth).

Active Cues

As your baby's hunger gets more intense, their signals also become more intense. They may continue with initial cues and add these:

- Fussing, squirming or acting unsettled.
- Trying to move their body into position for nursing while being held.
- Bobbing their head in search of the breast.

Late Cues

If made to wait too long, newborns may show these late signs of hunger. If your baby is extremely upset, try to calm them before feeding.

- Frantically searching for the breast (rapidly moving their head back and forth).
- Flailing, acting agitated or turning red.
- Crying or screaming.

This information should not be construed as medical advice, nor is it intended to replace the individual care of a health care professional.

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Breastfeeding is welcome here.

Your family medicine team supports your healthy choice to breastfeed. If you prefer a private space, please ask at the front desk.



Implementation Strategies & Elements

| Implementation Strategy | Description | Framework and Theory Alignment |
|--------------------------------|---|---|
| Conduct education meetings | Provider meeting to present information related to project and common breastfeeding challenges | B & L: Tasks and Individual skills Orem: Teaching, supporting, and guiding SEIPS: Process |
| Distribute education materials | After providers receive education, it will be distributed to all staff via email. Medical assistants will also receive an educational document for documentation of BF status | B & L: Systems Orem: supporting, Environment SEIPS: Process |

Well child template

History provided by

mother father grandmother grandfather

Interval problems

Recent illness

Recent injury

Caregiver stress

▼ Nutrition

Milk source

breastfeeding cow's milk formula

Additional intake

solids water non-nutritional

▼ Breastfeeding

Frequency of feedings

Every 1-2 hours

Every 4-5 hours

Every 6-8 hours

5-8 times per 24 hours

9-12 times per 24 hours

Sides per feeding

One side

Both sides

Feeding time per side (min)

Right breast

1-5

6-10

11-15

16-20

20+

Left breast

1-5

6-10

11-15

16-20

20+

▶ Formula

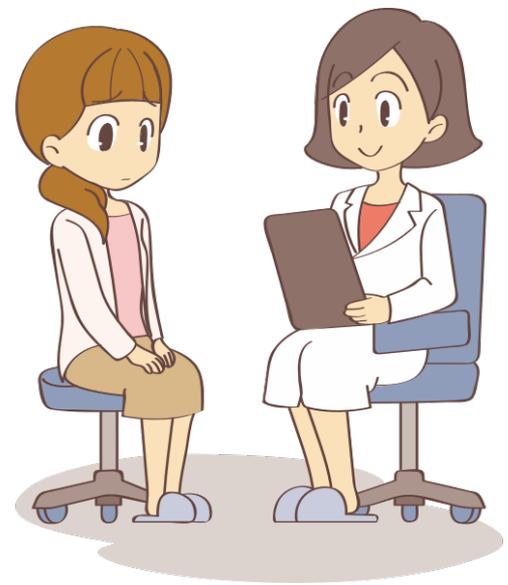
▶ Cereal

Implementation Strategies & Elements

| Implementation Strategy | Description | Framework and Theory Alignment |
|----------------------------------|--|--|
| Mandate change | Senior provider declared using the well child template as a priority | B&L: Leadership Orem: Supporting, Environment SEIPS: Process |
| Distribute educational materials | Patient education handouts | B & L: Systems Orem: Teaching SEIPS: Process |
| Provide ongoing consultation | DNP student will be available to support implementation strategies. | B & L: Leadership Orem: Guiding, environment SEIPS: Process |

Patient Handouts

- Anticipatory guidance
 - Prenatal (36+ weeks)
 - Newborn visit
 - 1 month
- Individual breastfeeding challenges
 - Poor/improper latch
 - Nipple pain
 - Engorgement, clogged duct, mastitis
 - Milk supply concerns



Implementation Strategies & Elements

| Implementation Strategy | Description | Framework and Theory Alignment |
|--|--|---|
| Identify and prepare a champion | Shared decision making to identify a champion | B & L: Leadership, tasks and individual skills Orem: Support and environment SEIPS: Process |
| Use data experts | Collect pre- and post-implementation data | B & L: Systems, tasks and individual skills Orem: Self-care agency, self-care SEIPS: Process and outcomes |
| Purposely reexamine the implementation | Measure outcomes to determine efficacy of implementation | B & L: Systems Orem: Self care SEIPS: Outcomes. |

Evaluation & Measures (handout)

| Topic | Concept | Tools for Measurement | When Measured | Who Measures |
|---------------------------|---|-----------------------|------------------------------------|-----------------|
| Implementation Strategies | Change physical environment with posters | Observation | Implementation | Student/Advisor |
| | Conduct education meetings | Provider feedback | Implementation | Student |
| | Mandate Change | EHR audit | Implementation/post implementation | Student/IT |
| | Distribution of Education to patients | Observation | Implementation | Student |
| Patient Outcome | Breastfeeding rates 0-6 moths of age | EHR audit | Pre- and Post-implementation | Student/IT |
| System Outcomes | Percentage of well child visits 0-6mo with BF status documented | EMR audit | Pre- and Post- implementation | Student/IT |
| Policy Outcome | New policy implementation for documenting BF status and providing education | EMR Audit | Post-Implementation | Student |

IRB Determination

- IRB determination was completed and approved by the organization
- Patient information was protected
 - HIPAA
 - Data de-identified before delivered to student from IT
 - Data kept in a password protected excel file at the project site
- Citi training

Analysis

- **Data**
 - Pre- and post-implementation
 - Documentation of Breastfeeding status
 - Breastfeeding, Formula, Both
 - Breastfeeding rates
 - Exclusive breastfeeding compared to formula
 - CPT codes: 99391 & 99381
 - Modifier evaluation and management code 99213
- **Analysis**
 - Descriptive statistics
 - Chi square test – Documentation of BF status
 - Monte Carlo test – Rate of infants exclusively breastfeeding

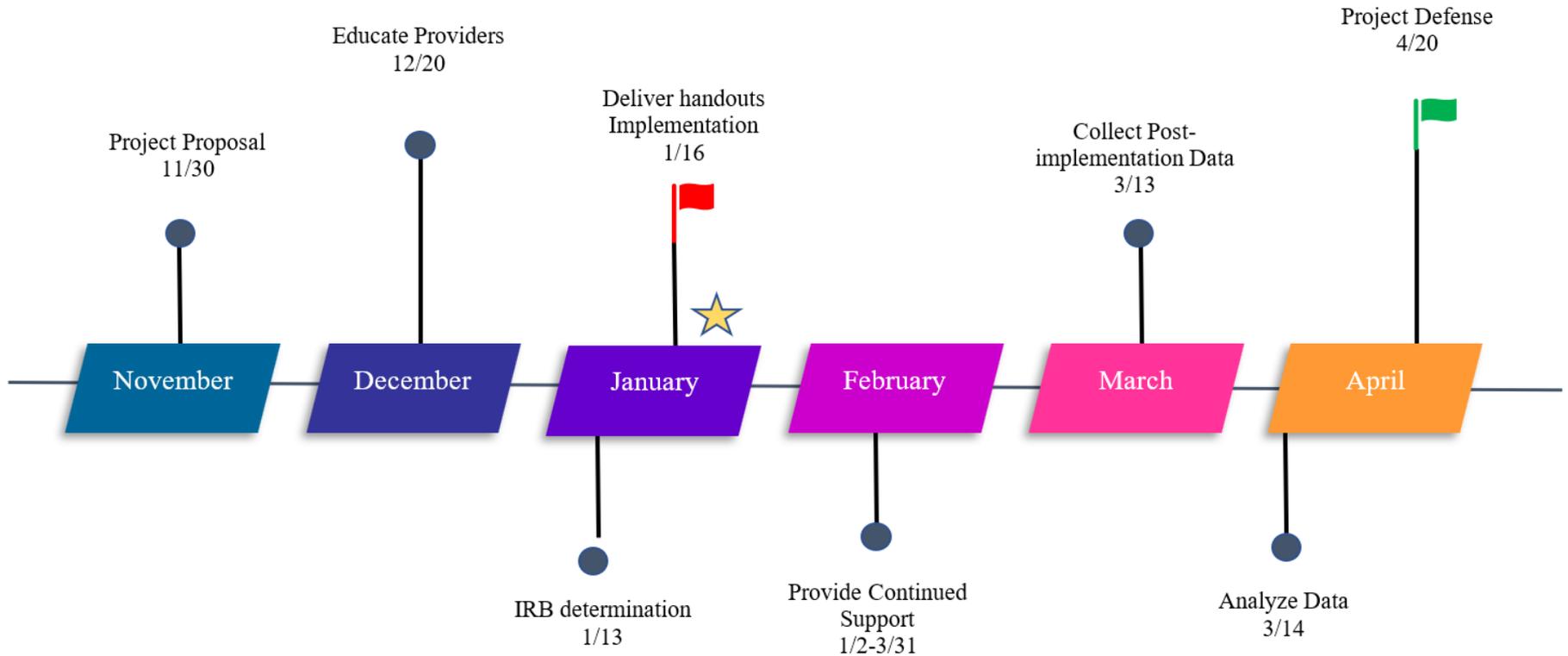
Analysis

The screenshot shows an Excel spreadsheet with the following data:

| | A | B | C | D | E | F | G | H | I |
|----|--------------------|----------|-------|----------|-----|------------|---------------|---------|------|
| 1 | Breastfeeding Data | | | | | | | | |
| 2 | Date | Provider | CPT | Modifier | Age | Documented | Breastfeeding | Formula | Both |
| 3 | 3/22/2022 | Provider | 99391 | | 29d | 1 | 1 | | |
| 4 | 3/23/2022 | Provider | 99381 | | 3d | 1 | | | 1 |
| 5 | 3/29/2022 | Provider | 99391 | 99213 | 2m | 1 | 1 | | |
| 6 | 4/14/2022 | Provider | 99391 | | 3m | 0 | | | |
| 7 | 4/16/2022 | Provider | 99392 | | 4m | 1 | | 1 | |
| 8 | Total: | | 5 | | | 4 | 2 | 1 | 1 |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |

The spreadsheet interface includes a ribbon with tabs for File, Home, Insert, Draw, Page Layout, Formulas, Data, Review, View, Automate, and Help. The active cell is G249. The status bar at the bottom shows 'Ready', 'Accessibility: Good to go', and a zoom level of 100%.

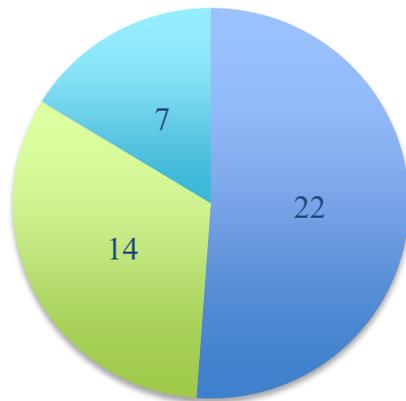
Timeline



 Collect Pre-implementation Data 1/16

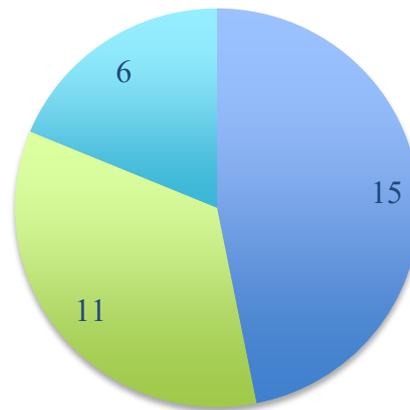
Results: Participant Characteristics

03/22- 06/22 N=43



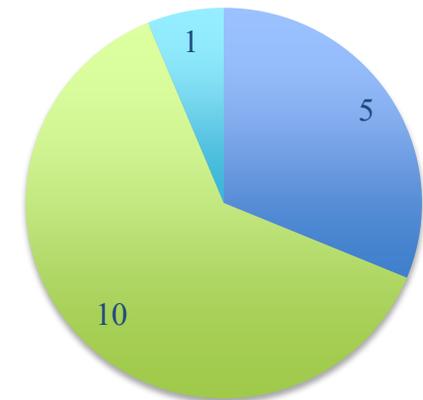
■ 0-1 mo ■ 2-4mo ■ 5-6mo

10/22- 01/23 N=32



■ 0-1mo ■ 2-4mo ■ 5-6mo

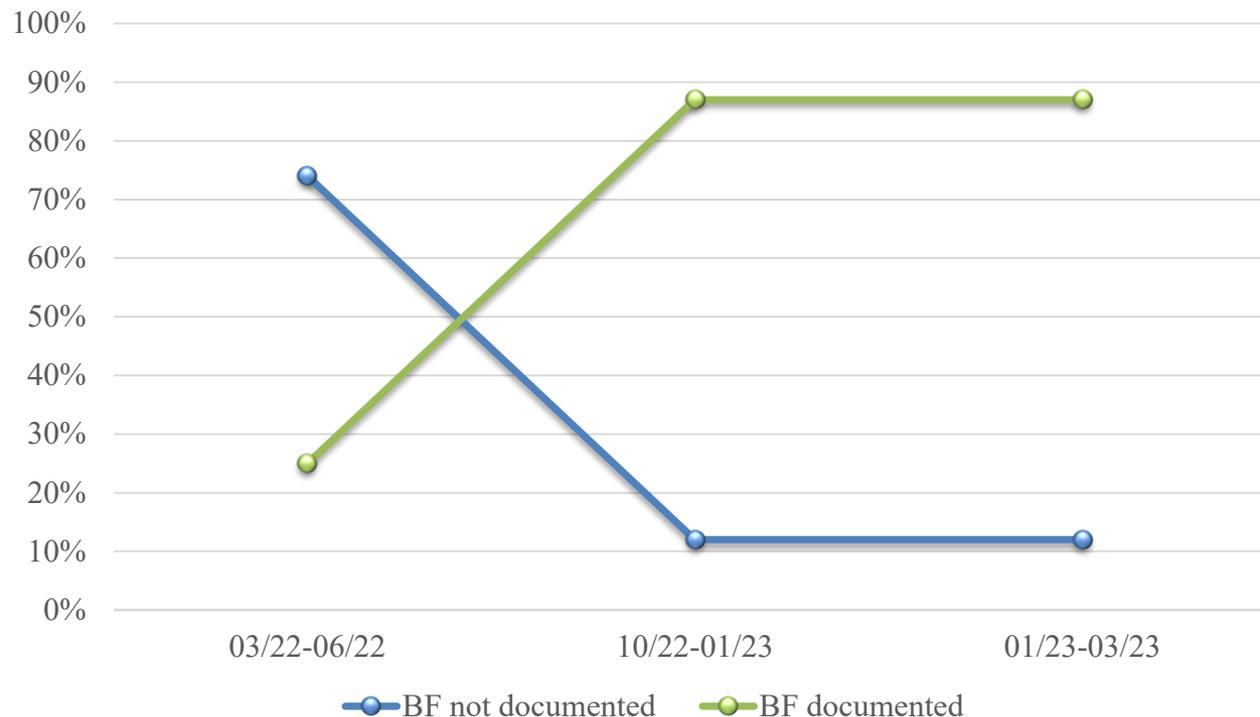
01/23- 03/23 N=16



■ 0-1mo ■ 2-4 mo ■ 4-6mo

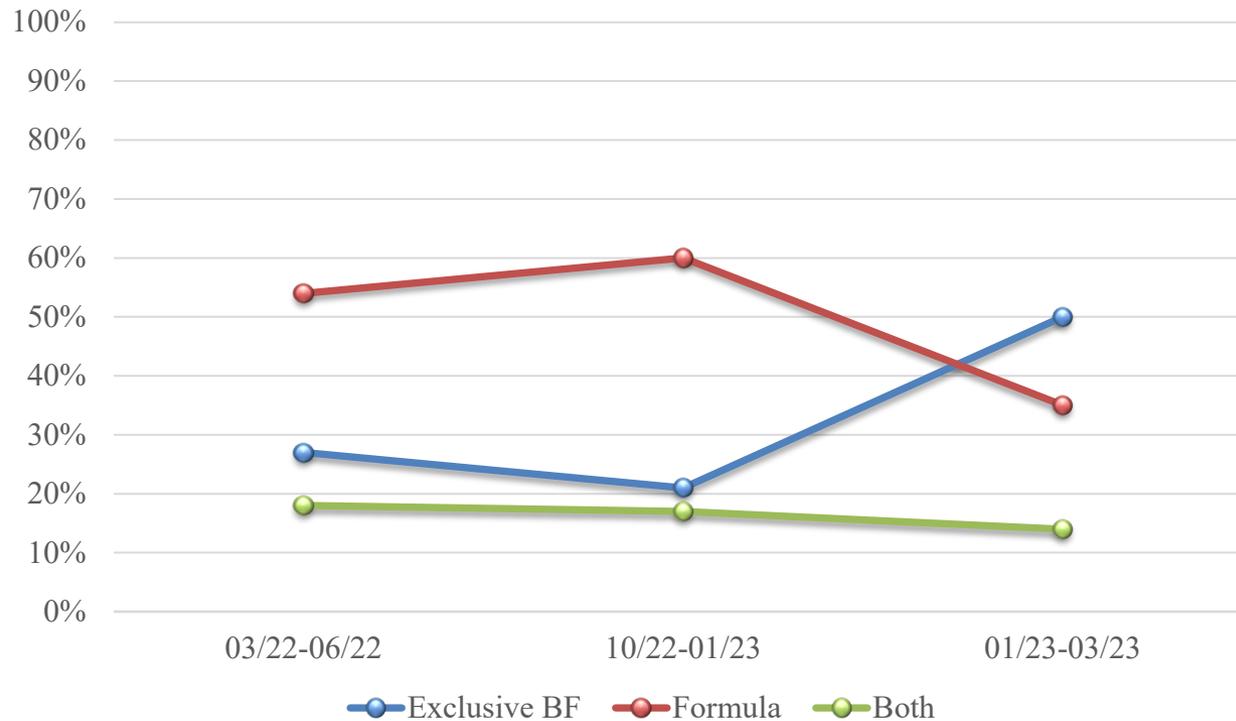
Results: System Outcomes

Breastfeeding documentation



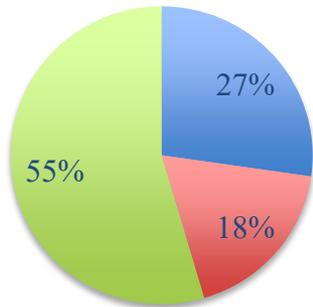
Results: Patient Outcomes

Breastfeeding Rates



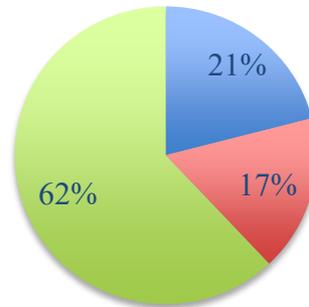
Results: Patient Outcomes

03/22- 06/22



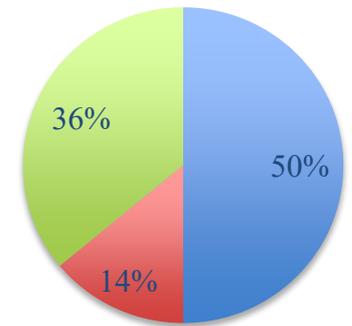
■ Exclusive BF ■ Some BF ■ Formula

10/22- 01/23



■ Exclusive BF ■ Some BF ■ Formula

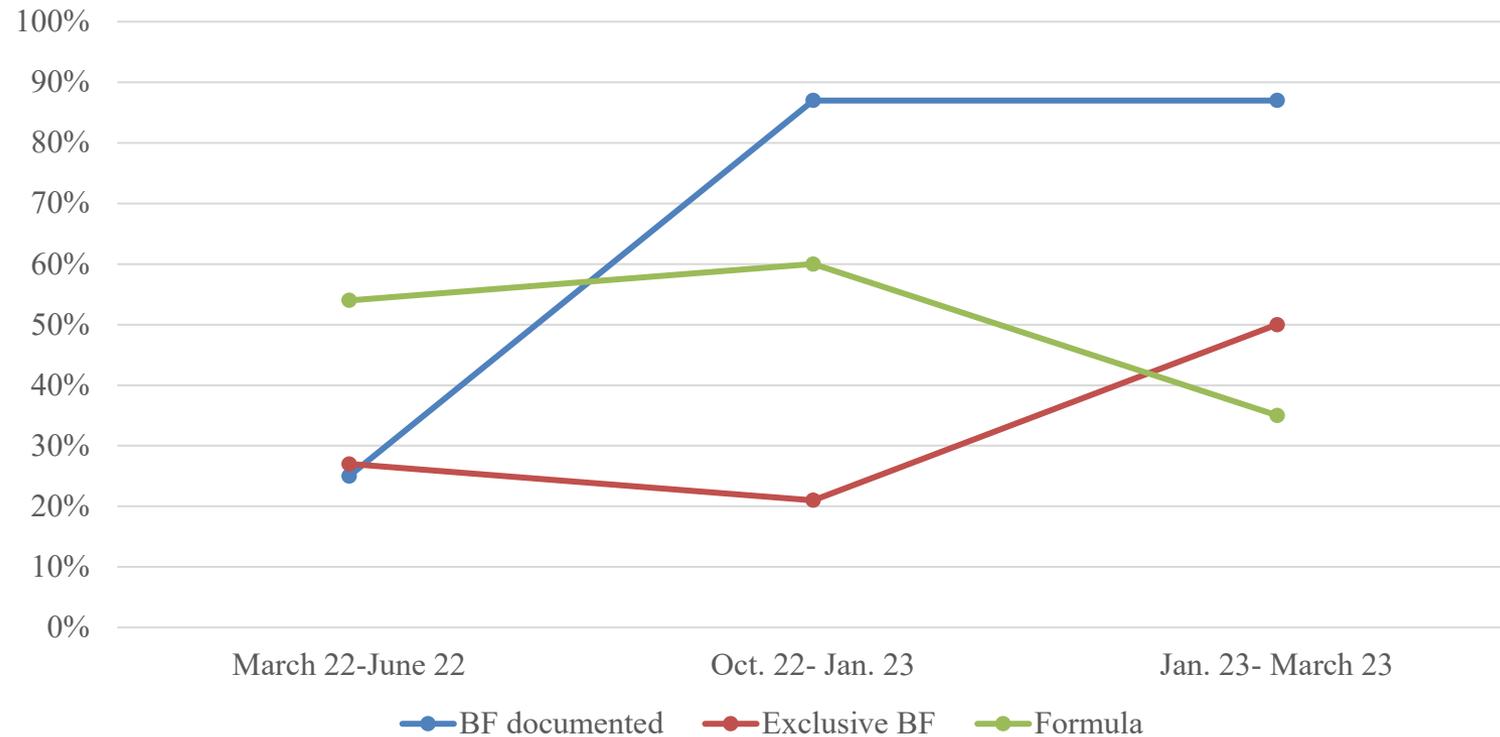
01/23- 03/23



■ Exclusive BF ■ Some BF ■ Formula

Results: Patient Outcomes

Breastfeeding documentation and Breastfeeding Rates



Discussion

- Standardized documentation process
 - Statistically significant increase in documentation of breastfeeding status ($P < .0001$)
 - Documentation allows for challenges to be addressed
- Breastfeeding friendly practice
 - Clinically significant increase in rates of infants exclusively breastfeeding
 - Available resources utilized for individualized counseling

Limitations

- Limited data
 - Small percentage of BF documented
 - Short implementation phase
 - Small patient population
- Pre-emptive use of well child template
- Culture/language barriers
- Staff buy-in (medical assistants)

Implications for Practice

- Documentation of breastfeeding status is imperative for accurate information
- Breastfeeding challenges must be addressed
- There is potential to increase breastfeeding rates by addressing challenges through education
- A breastfeeding friendly practice may result in higher breastfeeding rates
- Any practice caring for infants should have a breastfeeding policy

Budget & Resources

| | | |
|----|---|-----------------|
| 1 | <u>Doctor of Nursing Practice Project Financial Operating Plan</u> | |
| 2 | Interventions to Improve Breastfeeding Rates | |
| 3 | | |
| 4 | Revenue | |
| 5 | Project Manager Time (in-kind donation) | 4,000.00 |
| 6 | Team Member Time: | 0.00 |
| 7 | Primary Faculty Advisor, DNP (in kind donation) | 750.00 |
| 8 | Secondary Faculty Advisor, DNP (in kind donation) | 500.00 |
| 9 | Project Site advisor, MD (in kind donation) | 1,500.00 |
| 10 | Consultations | 0.00 |
| 11 | IT Team member | 160.00 |
| 12 | Statistician | 60.00 |
| 13 | Cost mitigation | 0.00 |
| 14 | Presidential Research Grant | 1,000.00 |
| 15 | TOTAL INCOME | 7,970.00 |
| 16 | | |

Budget & Resources

| | | |
|----|---|-----------------|
| 17 | Expenses | |
| 18 | Project Manager Time (in-kind donation) | 4,000.00 |
| 19 | Team Member Time: | 0.00 |
| 20 | Primary Faculty Advisor, DNP (in kind donation) | 750.00 |
| 21 | Secondary Faculty Advisor, DNP (in kind donation) | 500.00 |
| 22 | Project Site advisor, MD (in kind donation) | 1,500.00 |
| 23 | Consultations | 0.00 |
| 24 | IT Team member | 160.00 |
| 25 | Statistician | 60.00 |
| 26 | Cost of Space | 0.00 |
| 27 | Cost of print/copy education materials | 1,000.00 |
| 28 | Provider education (1/2 hour x 3 Physicians) | 150.00 |
| 29 | Provider education (1/2 hour x 1 Physician Assistant) | 30.00 |
| 30 | Provider education (1/2 hour x 1 Nurse Practitioner) | 25.00 |
| 31 | TOTAL EXPENSES | 8,175.00 |
| 32 | | |
| 33 | Net Operating Plan | -205.00 |
| 34 | | |

Conclusions

- Discrepancy in breastfeeding rates
- QI project to address discrepancy
- Documentation
- Breastfeeding friendly practice
- Next steps



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Sustainability Plan

- Champion- Project site advisor
 - Evaluates breastfeeding rates biannually
 - Ensures resources are available
 - Ensures education is completed
- The organization has access to the staff education after project has ended to use for onboarding and annual training as desired
- Patient education materials purchased/printed in excess for sustainability purposes
- Revenue gained from breastfeeding counseling visits could be utilized to purchase additional patient education material.

Dissemination



- Organization
 - Results of project and defense presentation will be shared with providers and practice manager at site
 - Copies of presentation will be made available to all staff in the breakroom
 - Completed manuscript will be shared with project site mentor
- Scholarly
 - Public defense presentation
 - Submission of manuscript to ScholarWorks

DNP Essentials Reflection

| DNP Essentials (AACN, 2006) | Reflection |
|--|--|
| I. Scientific Underpinnings for Practice | Literature Review Evidence to support interventions to promote breastfeeding |
| II. Organizational and Systems Leadership for Quality Improvement and Systems Thinking | Organization assessment, SWOT analysis Stakeholder engagement Planning and implementing QI project Leadership through lifespan of the project |
| III. Clinical Scholarship and Analytical Methods for Evidence-Based Practice | Utilization of evidence-based strategies to improve breastfeeding Evaluating and analyzing collected data. |
| IV. Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care | Use of EHR for implementing standard process for breastfeeding documentation Use of EHR for data collection |

DNP Essentials Reflection

| DNP Essentials (AACN, 2006) | Reflection |
|--|--|
| V. Health Care Policy for Advocacy in Health Care | Advocated for documenting breastfeeding status Advocated for a breastfeeding friendly practice to promote breastfeeding |
| VI. Interprofessional Collaboration for Improving Patient and Population Health Outcomes | Meetings and ongoing communication with multiple members of the interdisciplinary team |
| VII. Clinical Prevention and Population Health for Improving the Nation's Health | Analysis of breastfeeding rates in community Implemented strategies to promote breastfeeding |
| VIII. Advanced Nursing Practice | Assessment of disparities in breastfeeding rates compared to recommendations. Evaluated and implemented strategies to improve patient outcomes. |

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