A Quality Improvement Initiative to Improve Access and Patient Flow in a Non-Emergency Walk-in Care Clinic

Renee J. Broze

University of New Hampshire

Follow this and additional works at: https://scholars.unh.edu/scholarly_projects

Part of the Nursing Commons

Recommended Citation
https://scholars.unh.edu/scholarly_projects/95

This Clinical Doctorate is brought to you for free and open access by the Student Scholarship at University of New Hampshire Scholars' Repository. It has been accepted for inclusion in DNP Scholarly Projects by an authorized administrator of University of New Hampshire Scholars' Repository. For more information, please contact Scholarly.Communication@unh.edu.
A Quality Improvement Initiative to Improve Access and Patient Flow

in a Non-Emergency Walk-in Care Clinic

Renee J Broze
November 2023
University of New Hampshire
DNP Program
C. Colleran DNP
M. Godfrey PhD
Abstract

Background: A community-based non-emergency walk-in clinic in Southern New Hampshire experienced high volume and inefficient workflows during the pandemic, causing delays in care, long visit times, and low net promoter scores.

Purpose: Institute an evidence-based approach to improve work efficiency through innovative models of care.

Methods: A literature review on best practices for workflow redesign guided the project. The project instituted an on-demand telemedicine service and a clinic fast-track workflow. A mixed methods approach analyzed pre/post cycle times, net promoter scores, and themes from staff interviews. Pre/post cycle times analyzed 12,767 completed appointments.

Results: There was a statistically significant improvement in cycle times, with a P-value of < .0001. Door-to-door time decreased by 26%, waiting room time decreased by 56%, net promoter scores improved by 12.5%, and there was a 30.5% improvement in the percentage of appointments ≤ 60 minutes. 6.4% of patients were booked for telemedicine visits to offload clinic volume. Themes from the semi-structured interviews revealed supportive themes around improved workflow and communication and disruptive themes around nurse visits for telemedicine testing, EHR scheduling, and feelings of burnout.

Conclusions: There was improved clinic efficiency and ability to meet volume demands. The interventions contributed to these improvements. Additional studies that evaluate project effectiveness over time to account for seasonal variability, patient acuity across multiple sites, and the impact of workflow changes on staff burnout are indicated.

Keywords: acute and critical illness, quality and safety, evidence-based practice, workflow, efficiency, access to care
Table of Contents

Section I. Introduction

1. Problem Description ........................................................................................................ 6
2. Available Knowledge ........................................................................................................ 9
3. Rationale .......................................................................................................................... 10
4. Project Aims .................................................................................................................... 19

Section II. Methods

1. Context/Setting ................................................................................................................ 19
2. Interventions .................................................................................................................... 23
3. Measures .......................................................................................................................... 27
4. Analysis ............................................................................................................................ 28
5. Ethical Concerns ............................................................................................................... 29

Section III. Results

1. Virtual Immediate Care .................................................................................................... 32
2. Fast-Track Appointments ................................................................................................. 35
3. Visit Cycle Time and Statistical Analysis ........................................................................ 37
4. Semi-Structured Interviews of Staff ............................................................................... 40

Section IV. Discussion

1. Summary ......................................................................................................................... 43
2. Interpretations ................................................................................................................... 44
3. Limitations........................................................................................................44
   a. Financial Considerations..............................................................................45
4. Conclusions......................................................................................................47
5. Funding.............................................................................................................48

References...........................................................................................................49

Search Criteria......................................................................................................54

Appendix A: Global and Specific Aim Worksheet.............................................55
Appendix B: NRC CAHPS Survey and Monthly NPS Scores.............................58
Appendix C: Root-Cause Analysis/Fishbone Diagram........................................59
Appendix D: Workflows........................................................................................60
   Proposed Changes..............................................................................................60
   Fast Track Workflow..........................................................................................61
   Virtual Immediate Care Scheduling Workflow.................................................63
Appendix E: Outcomes from Semi-Structured Staff Interviews.........................64
   Themes and Subthemes.......................................................................................65
   Questions and Answers.......................................................................................67

Appendix F: Statistical Summary of Pre/Post Cycle Times and Average Daily

Volume..................................................................................................................69

Tables:

1. Specific Project Aims, Purpose, Goals, Expected Outcomes.........................8
2. Top Ten Patient Concerns Treated at Immediate Care.....................................21
3. Objectives and Specific Measures....................................................................24
4. Project Activity Grid........................................................................................................26
5. Data Collection and Reporting Guide................................................................................28
6. Virtual Immediate Care Scheduling Guidelines..................................................................32
8. Semi-Structured Staff Interview Questions......................................................................41
9. Major Themes and Sub-Themes from Semi-Structured Interviews...............................41
10. Semi-Structured Interview Results................................................................................42

Figures:

1. Cause and Effect Diagram................................................................................................12
2. Flowchart of Clinic Processes Based on the Five Phases of Care Model......................14
3. Microsystem Improvement Process Spiral ......................................................................17
4. Volume, Average Visit Time, % completed within 60 minutes: Pre-Project.............22
5. Net Promoter Score, Average Volume & Door-to-Door Time: Pre-Project.............23
6. Pre-Project Standard Clinic Workflow with Proposed Changes..................................25
7. Workflow Change #1: Fast Track Appointments..............................................................30
8. Workflow Change #2: Virtual Immediate Care Scheduling...........................................31
9. Average Door-to-Door for Fast-Track Eligible Diagnoses: Pre and Post...............36
10. Average Volume, Cycle Times, Percent completed within 60 minutes: Pre and Post..................38
11. Pre- and Post-Project Outcomes......................................................................................39
12. Monthly NPS, Average In-Clinic Daily Volume & Percent of Daily Volume Seen Virtually.................................................................40
Section I. Introduction

Problem Description

When demand for healthcare exceeds clinic capacity, patients must wait to be seen. Some waiting is inevitable in walk-in settings such as emergency departments and non-emergency walk-in clinics. Published literature demonstrates that patient flow can be improved by decreasing length-of-stay for low-acuity patients through standardized intake processes, effective triage, initiating "fast track" protocols for low-acuity patient concerns, and offering on-demand virtual appointments for specific patients (Breen et al., 2020; Lot et al., 2018; Michael et al., 2013; Orredson et al., 2011, Wosik et al., 2020).

This quality improvement project aimed to assess current workflows and identify inefficiencies, plan and implement workflow changes based on literature reviews to improve visit cycle times to meet national and institutional benchmarks, reduce non-value-added time by reducing redundancies in care and data collection, improve communication between staff members, evaluate staff perceptions of workflow redesign, and identify additional topics for study and improvement.

This project took place at a hospital-owned non-emergency walk-in clinic in Southern New Hampshire in a suburban setting. The clinic saw unprecedented volume surges due to the COVID-19 pandemic, often seeing double the pre-pandemic average daily volume. COVID-19 magnified workflow inefficiencies as staff struggled to keep up with volume demands. Waiting room time and total visit time skyrocketed due to the higher patient volumes, causing unhappy patients, delays in care, and stressed-out staff.

The project started by evaluating multiple causes of delays during visits and drivers for increased demand for walk-in care through root-cause analysis. The benchmark daily average
door-to-door visit time for an established urgent care center is ≤ 60 minutes (Experity Health, N.D.; UCAOA, 2020). In December 2022 the project site reported average visit cycle times of 77 minutes. While there is no benchmark standard for the time a patient waits in a waiting area in a non-emergency walk-in clinic, pre-project analysis of clinic cycle times revealed average waiting room times of approximately 25 minutes. Waiting room time is considered “non-value-added” time because patient care does not occur in the waiting area.

Cycle times in a walk-in clinic encompass all processes from when patients seek care to when they leave (Chadha & Dunne, 2021; Chand et al., 2009). Patients seeking a medical evaluation must be registered, triaged, roomed, evaluated, and potentially undergo diagnostic testing and disposition before being discharged or transferred to another level of care (Chadha et al., 2021; Nelson et al., 2011). The patient will interact with multiple staff, including registration, nurses, providers, radiology technicians, and lab technicians. Waiting can occur before registration, in the outer waiting room, in an exam room, or when waiting for test results.

Most visits also require supporting processes such as communication after the appointment, coordination of care, and prescription ordering (Lot et al., 2018; Nelson et al., 2011). More efficient and effective care occurs when these processes are optimized, standardized, and non-value-added time minimized (Breen et al., 2020; Berg et al., 2020; Nelson et al., 2011). Table 1 outlines the project purpose, goals, and expected outcomes using the Dartmouth Microsystem Framework Project Planning Tool (Nelson et al., 2011).

**Table 1.**

**Specific Project Aims- Purpose, Goals, and Expected Outcomes**

*Microsystem Framework Planning Tool (Nelson et al., 2011). (Appendix A)*

<p>| Project Theme                                      | • Improve access to timely care in the clinic |</p>
<table>
<thead>
<tr>
<th><strong>Global Aim</strong></th>
<th>• Assess the patient flow and identify strengths, weaknesses, and opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Aims</strong></td>
<td>• Improve access to care by reducing non-value-added time in the clinic, decreasing door-to-door times, and creating additional appointments for higher patient volumes</td>
</tr>
<tr>
<td></td>
<td>• Evaluate workflow processes: registration, triage, rooming, documentation, and efficiency of workflows</td>
</tr>
<tr>
<td><strong>The process began with:</strong></td>
<td>• Identifying inefficient processes that caused delays and non-value-added time</td>
</tr>
<tr>
<td></td>
<td>• Standardizing nursing rooming processes</td>
</tr>
<tr>
<td></td>
<td>• Using a team approach to create a fast-track protocol for low acuity patients</td>
</tr>
<tr>
<td></td>
<td>• Measuring outcomes from the new on-demand telehealth service and how it impacted the in-clinic flow</td>
</tr>
<tr>
<td></td>
<td>• Using PDSA cycles to improve patient flow</td>
</tr>
<tr>
<td><strong>The process ended with:</strong></td>
<td>• Patients receiving evidence-based care in a timely manner</td>
</tr>
<tr>
<td></td>
<td>• After identifying redundant and inefficient processes, workflow changes demonstrated decreased wait times and total visit time for high-volume/low-acuity patients and improved NPS scores.</td>
</tr>
<tr>
<td><strong>By working on this project, we expected that:</strong></td>
<td>• Average wait times and door-to-door times decrease.</td>
</tr>
<tr>
<td></td>
<td>• Improved Net promoter score with a goal of 70% or higher</td>
</tr>
<tr>
<td></td>
<td>• Improved communication with team members</td>
</tr>
</tbody>
</table>
It was important to work on this project now because:

- Staff turnover due to decreased satisfaction, lack of autonomy, and working in a chaotic environment further disrupted patient flow by leaving clinics short-staffed or staffed with untrained caregivers unfamiliar with standard workflows.
- Patient complaints and decreased satisfaction with care due to long visit cycle times and delays in care.
- Patients unsatisfied with their care are less likely to return or refer friends and family and are more likely to provide negative reviews online.
- Implementing this project during the summer, when volumes are historically lower, allowed additional time for planning and teamwork to be prepared for increased volumes in the fall.

Project Stakeholders

- The DNP student
- Immediate Care Division Coordinator
- Site Manager
- Chief Quality Officer
- Division Director of Operations
- Faculty Advisor

Available Knowledge

The Institute for Healthcare Improvement (IHI) quadruple aim focuses on improving the patient care experience, population health, reducing healthcare costs, and improving the working conditions of healthcare workers (Berwick et al., 2008; Bodenheimer & Sinsky, 2014; IHI.org, n.d.; Murray & Berwick, 2003). The first aim of improving the patient experience includes healthcare quality and patient satisfaction (IHI.org, n.d.). Patients want high-quality, effective, and cost-efficient care, and the clinic's operations influence a significant part of their experience and satisfaction (Lot et al., 2018; Van Der Linden et al., 2019). When healthcare practices provide efficient care with minimal delays and avoid duplication of efforts, patients benefit and are more satisfied with their experience (Lot et al., 2018; Michael et al., 2013). Additionally, patients with simple health concerns who do not have to wait in line behind several patients
with more complicated problems are more satisfied with their care and likely to return and recommend others to the practice (Bleustein et al., 2014; Carpenter, 2021; Lot et al., 2018).

The International Federation of Emergency Medicine (IFEM) published an updated framework on quality and safety in emergency medicine in 2020 (Hansen et al., 2020). IFEM indicators for quality care focused on patient safety by ensuring that well-trained clinicians follow evidence-based guidelines and adequate staffing to provide care based on patient volume and acuity. Timely and efficient care and effective communication between healthcare providers were significant priorities in the published framework (Hansen et al., 2020).

Queueing theory is a mathematical model for waiting in line, which happens whenever demand for service exceeds capacity. Queueing theory dates to 1909 when AK Erland in Denmark used mathematics to study and optimize telephone line call frequencies (Swamidass, 2000). Queueing theory assists with capacity design and balancing operating costs with customer demand. This DNP project followed mathematical queuing theory to identify and mitigate bottlenecks when people or objects are in line (Carpenter, 2021; Anisimov & Limnios, 2021).

Various health concerns lead people to seek same-day evaluation (Coster et al., 2017; O’Cathain et al., 2020). Many patients call their primary care provider's office about an acute health concern. They are often directed to a same-day walk-in clinic if no same-day appointment is available, and the concern is not life-threatening. Other people have no primary care provider and decide to come in for evaluation for both acute and chronic complaints. Some people want to bypass the wait time and expense of an emergency department for severe symptoms such as chest pain, significant head injury, bleeding, breathing difficulty, or worsening of chronic conditions such as congestive heart failure (Coster et al., 2017). While the most severe complaints are ultimately sent to an emergency department, these acutely ill
patients require immediate triage and can consume much time and resources before transfer.

Social and emotional factors also influence decision-making about seeking same-day care. (O'Cathain et al., 2020). Some people seek care because of pain or discomfort; some consult the internet first and become concerned about their symptoms. Some are anxious or want reassurance, diagnostic testing, or prescription medication. Some employers and schools require an evaluation to excuse an absence or work-related injury. Other factors that can influence decision-making around the perceived urgency of care stem from anxiety about one's health, health literacy level, coping capacity, resources, and the influence of society and online searches (O'Cathain et al., 2020). Other strong drivers for same-day walk-in care are convenient hours and days, location, transportation, lack of primary care availability, and cost (Coster et al., 2017). Figure 1 presents a fishbone cause-and-effect diagram of the root causes of factors that influence increased demand for same-day care, causing long appointment times at the project site.

Long wait times are strongly associated with decreased patient satisfaction and confidence in the provider (Bleustein et al., 2014; Chadha et al., 2021; Michael et al., 2013). While evidence-based, quality care is of utmost importance, overall patient satisfaction with the care experience is also a priority of this project. Patients are the healthcare industry’s customers, and providing quality care that meets or exceeds their expectations is a priority.
Figure 1.

Cause and Effect Diagram: Factors that influence increased demand for same-day care and long visit times
In a 2018 article by Lot et al., Lean strategies were implemented to improve appointment wait times. This published work focused on improved workflow processes, communication, efficiency in data use, appropriate use of resources, and process times (Lot et al., 2014). Lean healthcare uses continuous process improvement methods to add value to the client and eliminate waste. The "Gemba" walk follows patients through each visit step to identify processes that need redesigning to better meet patient needs. This DNP project also included direct observation of operations, creating flow charts of processes that would impact the project's specific aims, and reporting back to the project team for planning and PDSA cycles.

In a 2020 systematic review by Tlapa et al., 40 published works that used Lean Healthcare (LH) and Lean Six Sigma (LSS) strategies to reduce wait times in outpatient offices and emergency departments were reviewed (Tlapa et al., 2020). Most reviewed studies focused on length-of-stay, with half reporting a significant improvement with LH and LSS strategies. More than half of the studies demonstrated decreased waiting time to see a healthcare provider. Waiting time for treatment and appointments and the number of patients who left without being seen were also significantly reduced. Only eight of the 40 studies evaluated patient satisfaction, but those that did reported an improvement in seven out of eight published works. Two studies evaluated staff satisfaction, and both reported significant improvement. Many studies combined LH, LSS, and other strategies. "Lean healthcare focuses on reducing waste...and Lean Six Sigma uses the define, measure, analyze, improve and control framework to reduce process variation, mainly with statistical tools" (Tlapa et al., 2020, p. 267). This systematic review found that most studies mapped their activities to understand better patient flow and where to make changes in patient care processes.

In a 2018 report by Improta et al., a multidisciplinary approach studied and implemented lean healthcare methods to improve patient throughput in a large government-funded emergency
department (Improta et al., 2018). They analyzed six months of data related to patient flow and used qualitative analysis to perform value stream mapping. Value stream mapping allowed them to identify where bottlenecks and non-value-added time occurred and plan for process improvement. They identified that emergency department patients go through five phases of care: triage, examination, diagnostic testing, advice, and dismissal. It was found that time waiting for results, unclear delineation of tasks, and staffing variability were the most significant contributors to non-value-added time. Of their average 4-hour and 18-minute emergency department visit, 80% was non-value-added time. After reworking several processes, they reduced non-value-added time and improved patient throughput. Figure 2 outlines clinic processes at the project site based on the five phases of care model.

Figure 2.

Flowchart of Clinic Processes Based on the Five Phases of Care Model:
While the DNP project scope and limited timeframe did not allow time for complete value-stream mapping and reworking multiple processes, specific cycle times and bottlenecks were analyzed to identify processes that could be reworked to improve patient flow.

In a 2021 article by Carpenter, improved patient flow in an urgent care was achieved by applying queuing theory and implementing the Emergency Severity Index (ESI) tool at check-in (Carpenter, 2021). This project identified and stratified patients at registration, reducing the length of stay for low-acuity patients and improving patient and staff satisfaction. Queuing patients into appropriate levels of care maximized efficiency, improved communication, and minimized waiting time to receive care.

While the impact of implementing a virtual urgent care service is relatively new in the literature, published studies that evaluate patient satisfaction with on-demand virtual care are very positive (Aungst, 2019; Ramaswamy et al., 2020), with most patients receiving appropriate care or a referral for an in-person evaluation if indicated (Smith et al., 2021; Khairat et al., 2021; Martinez et al., 2018). In a 2021 study by Khairat et al., in-person urgent care visits were compared with virtual urgent care times. The average time for an in-person visit was 70 minutes, and 9.38 minutes for a virtual urgent care visit (Khairat et al., 2021). Over 94% of the patients who chose virtual urgent care were highly satisfied with the experience (Khairat et al., 2021). In another 2021 study by Smith et al., virtual urgent care was utilized for nearly all covid-related concerns over a two-month study period, with only 6.8% requiring a subsequent visit within 72 hours for the same concern, and 1.8% requiring a trip to the emergency department within 72 hours (Smith et al., 2021). In a pre-pandemic study of direct-to-consumer virtual urgent care, Martinez et al. concluded high satisfaction (85%), with the happiest patients receiving a prescription, diagnostic testing, or a referral (Martinez et al., 2018).
Rationale

Organizations must also manage system constraints to improve access (Murray & Berwick, 2003). The Theory of Constraints (TOC) offers methods to identify and mitigate conditions that prevent a process from achieving a goal (Goldratt, 1990). This involves ensuring adequate staffing, supply management, reviewing processes to ensure minimal data collection and documentation duplication between nursing and provider staff, and delegating appropriate tasks. Having contingency plans for high-volume times, such as diversion to less-busy sites, hiring per-diem staff, and offering telemedicine to appropriate patients, are ways to manage system constraints.

TOC acknowledges that every complex system has multiple factors that may limit an organization from reaching its goals (Breen et al., 2002). In every complex system, multiple processes are connected, and one or more constraining factors and the interdependency of those processes can impact the efficiency and effectiveness of the entire system (Breen et al., 2002). A healthcare team can implement systematic improvements using PDSA cycles once limiting factors are identified.

Multiple processes occur during an urgent care appointment. If there is a limiting factor, such as no streamlined process for the most basic and high-volume patient concerns, it will slow the system down. Known system constraints for this project were patient volume and acuity variability depending on the time of day, day of week, and seasonal variation. Other constraints were space and staffing, time waiting for radiology reports from the on-call radiologist, and variability in the experience of staff members who may not be as comfortable with handling multiple patients simultaneously. Staff who are more resistant to changing their work habits until they are convinced it will benefit them is also a limiting factor in any workflow redesign (Heath & Heath, 2010; Rogers, E.M, 2010). Including all
staff in planning and implementing workflow changes instead of trying to get buy-in on a change after the project was already planned is the most effective method for reducing resistance to changing workflows (Heath & Heath, 2010; Heath & Heath, 2007; Nelson et al., 2011; Rogers, 2010).

The evidence-based practice framework that guided this project is the Dartmouth Microsystem Improvement Curriculum (DMIC) (Nelson et al., 2007; Nelson et al., 2011). DMIC is a well-established framework for improving healthcare system processes using components from the microsystem improvement process (MIP) spiral (Figure 3.).

Figure 3.

The microsystem model starts with assessing current processes, identifying an improvement theme, and creating global and specific aims (Appendix A). The aim statements move the process change, and workflow processes are re-evaluated using repeated PDSA cycles until desired outcomes are achieved. The final phases of the MIP spiral include sustaining and disseminating phases, where processes are standardized, sustained, and disseminated to other appropriate clinical areas (Kosnik & Espinosa, 2003; Nelson et al., 2011).

Due to this project's limited time and scope, a comprehensive microsystem evaluation and improvement of multiple workflow processes were not possible (Nelson et al., 2007; Nelson et al., 2011). The project embraced the importance of clinical team member consultation to plan, implement, and optimize patient care processes effectively. It borrowed from the microsystem model by using a team-based approach with global and specific aims, PDSA cycles, and a project sustainability and dissemination plan focusing on the core process of access.

The Clinical microsystem approach has been used in many clinical settings with documented success in transforming clinical care to meet patient needs (Likosky, 2014; Nelson et al., 2011; Nelson et al., 2007; Michael et al., 2013). It is a team-based approach with clinical and business aims that link services to performance outcomes (Likosky, 2014). The team that works in a specific clinic setting, such as the staff in a non-emergency walk-in care clinic, is a microsystem. Microsystems are linked with other Microsystems through a mesosystem, and the macrosystem reflects the larger healthcare system where the smaller systems operate.
Project Aims

The objectives of this DNP project were to identify factors that cause long wait times and total visit cycle times using DMIC Microsystem Framework assessment tools, plan and implement process-improvement strategies using the plan-do-study-act (PDSA) model (Nelson et al., 2007), evaluate the impact of those changes related to visit cycle times and net promoter score, gain an understanding of staff perspectives around process improvement (Michael et al., 2013; Nelson et al., 2011), and plan for sustainability and dissemination of workflow changes.

Specific aims were to improve access to care, reduce non-value-added appointment time, decrease door-to-door appointment times to achieve national benchmarks, and create additional appointments with on-demand telehealth to handle high patient volume. Lean Healthcare and Clinical Microsystem Framework tools provided a high-level analysis of clinic operations, including a root cause analysis, workflow diagrams, and direct observation (Appendix A, C & D).

Section II. Methods

Context/Setting

The DMIC framework starts with an evaluation of the "5 Ps", precisely the “purpose, patients, professionals, processes, and patterns” (Nelson et al., 2011) at the microsystem unit. The practice site in Southern New Hampshire is a hospital-owned non-emergency walk-in care center called an “Immediate Care Clinic” (SNHHS.org, n.d.) It is in a suburban community, serving over 15,000 patients annually. The project site is one of four Immediate Care clinics owned by the hospital system. Patient volume averages between thirty and sixty daily appointments, with seasonal variation. During the project, the average daily volume was 41 patients per day. Colder months bring an additional 10-20 patients daily due to cold and flu
season. The average daily volume at the site is consistently higher than the national average of 31 patients per day for an established Urgent Care Clinic (Experity Health, n.d.). The pandemic brought even higher surges in patient volume, some days seeing 75 or more patients. Daily volume remains higher than pre-pandemic numbers even post-pandemic. However, the percentage of patients who left without being seen between September 2022 and September 2023 remained low at 0.24%.

The project site has a predictably higher volume than the other three Immediate Care clinics, with morning and evening volume surges of 10 or more patients per hour. When more than five or six patients come in per hour, depending on acuity, it slows clinic operations down. The problem gets further compounded as more patients walk in. Online posting of estimated wait times started in 2021 to help control hourly volume, but the clinic can become quickly overwhelmed with patients between 9 am and 11 am and 4 pm to 7 pm.

The clinic has been in operation for ten years. The clinic is open seven days a week, every day of the year. Operating hours are 9:00 am to 7:00 pm Monday through Friday and 9:00 am to 6:00 pm on weekends and holidays.

The clinic has six exam rooms and has the smallest office space of the four Immediate Care sites. Finding room for supplies, workstations, office space, and other needed services is challenging. There is an outpatient laboratory and radiology suite on site. Family medicine and Pediatric outpatient offices are located next door. Other services include worker's compensation visits to evaluate work-related injury and illness, Department of Transportation (DOT) physicals, and sports physicals.

All registered patients are evaluated by a healthcare provider who determines if they should receive care at the clinic, be referred to the Emergency Department, or have a follow-up appointment with a primary care provider. While some patients who seek care at the clinic
need to be routed to the Emergency Department due to acuity, less than 3% of patients who came to Immediate Care were sent to the Emergency Department in 2022 and 2023. Because the project site is part of a more extensive network of outpatient primary care and specialist providers, it is also relatively easy to coordinate care, consult with specialists, and arrange follow-up appointments. Table 2 lists the top ten patient concerns commonly treated at the project site in 2022 and 2023.

**Table 2.**

**Top Ten Patient Concerns Treated at Immediate Care:**

- Abdominal/Gastrointestinal symptoms
- Eye complaints
- Gynecologic concerns
- Headaches, minor head injuries
- Lacerations and other minor skin injuries
- Orthopedic complaints and injuries
- Upper and lower respiratory infections/ COVID-19, Influenza, Strep Throat
- Skin infections and rashes
- Sexually transmitted infections
- Urinary tract infections

The hospital's mission is "dedicated to providing exceptional care that improves the health and well-being of the individuals and the communities we serve" (SNHHS.org, n.d.). Its vision is to "be the provider of choice, delivering convenient access to high-quality care in an environment that embraces dignity, compassion, and service to our community" (SNHHS.org, n.d.). The Immediate Care clinic is staffed by two providers daily (Doctor, Nurse Practitioner, or Physician Assistant) plus two or three nursing staff (RN, LPN, or MA). Other than unexpected call-offs, there is typically no variation in staffing day-by-day. Several per-diem providers and nursing staff help with volume surges and cover staff absences and
vacations. Dedicated front-desk patient service representatives are critical to the department's operations and are essential for coordinating care and offering on-demand telemedicine appointments. The site also has a radiology technician with a remote radiologist on-call and an on-site laboratory technician.

Figure 4 demonstrates the inverse relationship between daily volume, door-to-door visit times, and the percentage of patients who completed their appointments in the benchmark time ≤ 60 minutes in the pre-project period, December 2022 to April 2023 (Experity Health, n.d.; UCAOC, 2020).

Figure 4.

**Volume, Average Visit Time, and Percentage of Appointments Completed ≤ 60 min Pre-Project**

![Graph showing average daily volume, door-to-door time, and percent of appointments completed in 60 minutes or less from December 2022 to April 2023.](image-url)
Figure 5 shows a dip in the monthly net promotor score (NPS) when cycle times are longer and an improvement in NPS with lower daily volume and cycle times.

**Figure 5.**

**Net Promoter Scores by Month Compared to Average Patient Volume and In-Clinic Door-to-Door Time Pre-Project: December 2022 to April 2023**

<table>
<thead>
<tr>
<th>Month</th>
<th>Median Daily Volume</th>
<th>Median Waiting Room Time</th>
<th>Median Door-to-Door Time</th>
<th>NPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec'22</td>
<td>62</td>
<td>14</td>
<td>10</td>
<td>80</td>
</tr>
<tr>
<td>Jan'23</td>
<td>55</td>
<td>10</td>
<td>10</td>
<td>62</td>
</tr>
<tr>
<td>Feb'23</td>
<td>52</td>
<td>10</td>
<td>10</td>
<td>60.6</td>
</tr>
<tr>
<td>Mar'23</td>
<td>48</td>
<td>10</td>
<td>10</td>
<td>69.7</td>
</tr>
<tr>
<td>Apr'23</td>
<td>48</td>
<td>10</td>
<td>10</td>
<td>68.1</td>
</tr>
<tr>
<td>Apr'23</td>
<td>41</td>
<td>10</td>
<td>10</td>
<td>67</td>
</tr>
</tbody>
</table>

**Interventions**

The project evaluated the effect of optimizing patient flow using clinical evidence and best practices to create additional appointment access and minimize wait times by decreasing non-value-added time in the clinic and additional appointment slots with on-demand telehealth.

In-clinic patient flow was addressed by instituting a change in care delivery through streamlined appointments for low-acuity, high-volume diagnoses called “Fast Track” appointments. Table 3 is a summary of the project objectives and specific measures.
Table 3.

**Project Objectives and Specific Measures**

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Specific Measures Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Create an on-demand telehealth service to help offload clinic volume during high volume times.</td>
<td>• Volume of patients who were seen virtually instead of an in-clinic appointment.</td>
</tr>
<tr>
<td>2. Evaluate the effect of the new on-demand telehealth service on patient flow, access, and appointment times in the clinic.</td>
<td>• Percent of daily volume at the site seen virtually.</td>
</tr>
<tr>
<td>3. Implement a fast-track patient flow for low-acuity face-to-face patients in the clinic.</td>
<td>• Average daily in-clinic volume</td>
</tr>
<tr>
<td>4. Conduct semi-structured interviews of multidisciplinary staff to gain insights into their perspectives around workflow redesign.</td>
<td>• Average waiting room time</td>
</tr>
<tr>
<td></td>
<td>• Average door-to-door visit time (waiting room time plus time in room).</td>
</tr>
<tr>
<td></td>
<td>• “Net Promoter Score” (NPS). This score reflects overall patient satisfaction and is collected randomly and reported monthly. The organization-set target is 70% or higher.</td>
</tr>
<tr>
<td></td>
<td>• Thematic analysis results of semi-structured staff interviews around workflow redesign to identify common themes and sub-themes, gain insight into the staff’s perceptions of the redesign, and identify areas needing further improvement or study.</td>
</tr>
</tbody>
</table>

Project mapping provided a high-level assessment of processes. The planning and implementation phases included mapping current clinic processes and identifying where the new processes can be tested. Figure 6 depicts the pre-project standard workflow with proposed changes.
Figure 6:
Pre-Project Standard Clinic Workflow with Project Interventions (A and B).

Current Workflow

Flowchart showing the workflow for a non-emergency walk-in clinic, including pre-project and project interventions. The chart details patient flow from arrival, triage, diagnostic testing, and subsequent actions such as RN visits, tests, and patient follow-up. The flowchart highlights workflow changes (A and B) introduced by the project interventions.
The multidisciplinary team included the DNP student, who is also a Nurse Practitioner at Immediate Care and one of the VIC providers; the Faculty Advisor for the project, who is an expert and author of the DMIC framework; The Immediate Care Coordinator and Division Chair; the hospital Chief Quality Officer; the Team Lead RN; the Immediate Care Center Manager; and all of the staff members at the project site.

A project planning activity grid was created to identify planned activities and when they would occur and was shared with the clinical site team.

<table>
<thead>
<tr>
<th>Table 4. Project Planning Activity Grid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity</strong></td>
</tr>
<tr>
<td>Virtual Immediate rollout, PDSA, and planning</td>
</tr>
<tr>
<td>Site observation of current registration, rooming processes, triage, workflow interruptions, and common causes of bottlenecks.</td>
</tr>
<tr>
<td>Met with resource nurse and staff to plan and design fast-track protocol and standardize rooming documentation template</td>
</tr>
<tr>
<td>Implementation and PDSA cycles of new template and fast-track protocol</td>
</tr>
</tbody>
</table>
Evaluation of cycle times, ease of use, and post-project satisfaction surveys | Weeks of September 4, 11, 18, 25 | Data analysis and satisfaction survey  
Post-project planning for sustaining and disseminating the project to other sites | Weeks of October 2, 9, 16, 21 | DNP student presented project outcomes at the Organizational Quality Symposium on 10/18/23.  
Project data analysis and planning for further improvements and dissemination.  

**Measures**

Measures included electronic health record reports with de-identified patient information on daily volume and cycle times. The quality improvement data analyst assisted with obtaining this information from the electronic health database. The health system uses the EPIC electronic health record, which can robustly analyze population outcomes.

Volumes, cycle times, and monthly NPS scores compared five months prior to the project period with five months after the project period (Dec’22 to April ’23 compared with May’23 to September ’23). Between December 1st, 2022, and September 30th, 2023, 12,720 appointments were completed at the clinic and included in a pre-post cycle time analysis.

Monthly Net Promoter Scores (NPS), frequently considered a reflection of overall satisfaction with service, were analyzed for trends from automated NRC patient surveys (NRC.com, 2023). Monthly NRC reports reflect the previous month's patient responses. The organization also reports quarterly trends (Appendix B).

Results from semi-structured interviews of 12 randomly selected multidisciplinary staff were recorded and sorted by themes and sub-themes. Positive, neutral, and negative statements
about workflow, team dynamics, work environment, and improvement changes were further categorized and tabulated.

Table 5.

Data Collection and Reporting Grid

<table>
<thead>
<tr>
<th>Data</th>
<th>Collection Tool</th>
<th>Source of Data</th>
<th>Statistical analysis</th>
</tr>
</thead>
</table>
| Root cause analysis and Cycle Time | 1. Data analysis through EPIC EHR reports  
2. Direct observation,  
3. Workflow analysis | Direct observation  
Population-level data from the EHR for cycle times:  
Daily volume  
Time in the waiting area  
Door-to-door time | Fishbone diagram  
Bar graphs of median times  
Box and whisker plot  
T-test |
| Net Promoter Score            | NRC CAHPS survey                                                                | Monthly survey reports (The date of the report reflects the previous month's survey results). | Data Run chart                   |
| Staff satisfaction            | Semi-structured interview of staff about workflow                                 | Survey answers were evaluated for themes and sub-themes and categorized | Qualitative thematic analysis     |

Analysis

Comparative analysis statistics using box-plot diagrams, run charts, means and standard deviations, and t-test statistics were conducted using JMP statistical analysis software. The DNP student met with the University Statistical Consulting Group to ensure accurate data analysis and appropriate outcome reporting.

Project reporting domains included utilization, efficiency, and experience of care.

Population-level outcomes, process outcomes were reported in table and graph formats (Appendix F). Experience of care outcome data was reported in a combination of run charts for quantitative data and thematic analysis tables for qualitative data (Appendix E).
Quantitative data analysis included time in the waiting room, defined as the time when registration is complete to the time the patient goes to an exam room, and door-to-door visit time, defined as the time between registration and discharge, with histogram, bar charts, box-and-whisker plots, and pooled t-test analysis for two groups.

Qualitative data analysis of semi-structured staff interviews identified common themes and sub-themes. Staff were asked six questions to gain insight into their perceptions about clinic workflow and redesign and identify issues requiring further PDSA cycles and study.

**Ethical concerns**

The University and the clinical site reviewed and approved the project before implementation. This quality improvement project was deemed not subject to IRB review at the University and clinical site since no identifiable patient information would be collected or reported. Outcomes and comments from patients and staff were monitored continuously to ensure no substandard care and to address any concerns as they arose. While there was a concern that staff could become so motivated to fast-track patients to improve site metrics that shortcuts could be made and appropriate patient care could be missed, this was not observed. Quality and evidence-based practice were maintained throughout the project. No conflicts of interest were identified, and no funding was obtained for the project.

**Section III.**

**Results**

A “Gemba walk” (direct observation of clinic processes) was conducted at the beginning of the project to identify and analyze variability in practices and workflow around scheduling, triage, rooming, throughput, and communication patterns (Breen et al., 2020; Lot
et al., 2018). The information from these observations was shared with the team for process improvement, with discussions on best practices to address any identified deficiencies. Flow maps were created to document observed workflow processes and plan for workflow changes (Figures 7 & 8).

**Figure 7.**

**Workflow Change #1: Fast-Track Workflow for Low-Acuity Patients**

- **Fast Track Eligible:**
  - Age 5 to 74
  - Simple UTI (no fever, female, non-pregnant, no mild back pain)
  - Strep test/Sore throat
  - Sinus symptoms only
  - Simple rash (no other symptoms)
  - Cold symptoms (no fever or shortness of breath)
Figure 8.

Workflow change #2: Virtual Immediate Care Appointment Scheduling

4 ways patients can be scheduled for virtual appointments:
- Direct from PCP Office (by phone)
- Calling Immediate Care (IC) line and booking with the PSR over the phone
- Being offered virtual appointment when they check in at registration
- “Level Loading” - RN in clinic offers patient telemedicine appointment, OR
  - Virtual provider scans schedule and contacts clinic, asks RN to offer virtual appointment
Virtual Immediate Care

In the months leading up to the start of the DNP project, the DNP student was involved in the planning and rollout of the Virtual Immediate Care (VIC) service. The VIC service required much time, preparation, and coordination of several departments before implementation. Workflows and policies were created based on best practices and regulations around telemedicine. Information technology, finance, human resources, quality improvement, risk management, marketing, nursing, center managers, and the clinical team were all involved in the planning and rollout of the service. A list of VIC-appropriate concerns was approved as policy before the service started (Table 6), with in-services to ensure all staff knew of the program, policies, procedures, and what types of patient concerns would be appropriate for a virtual visit. Schedulers were advised to offer telemedicine as an alternative to an in-person visit at the Immediate Care sites any time there was a wait to be seen in the clinic if the reason for the visit was appropriate.

Table 6.
Virtual Immediate Care Eligible Patients

<table>
<thead>
<tr>
<th>Eligible Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 6-64 (may expand age range with provider consultation) and:</td>
</tr>
<tr>
<td>• Cold sores</td>
</tr>
<tr>
<td>• Cold and flu symptoms</td>
</tr>
<tr>
<td>• Covid-19 evaluation (testing)*</td>
</tr>
<tr>
<td>• Diarrhea/Nausea</td>
</tr>
<tr>
<td>• Gout</td>
</tr>
<tr>
<td>• Impetigo, Rashes (dermatitis, eczema, poison ivy/oak, fungal rash, shingles, sunburn)</td>
</tr>
<tr>
<td>• Minor burns</td>
</tr>
<tr>
<td>• Pink eye/conjunctivitis/stye</td>
</tr>
<tr>
<td>• Seasonal allergies</td>
</tr>
<tr>
<td>• Sinus congestion/pain/sinusitis</td>
</tr>
<tr>
<td>• Sore throat*</td>
</tr>
<tr>
<td>• Sexually transmitted infection screening *</td>
</tr>
<tr>
<td>• Superficial wounds not requiring procedures</td>
</tr>
</tbody>
</table>
• Tick bites/Insect bites/Stings
• Dental pain
• Urinary symptoms with suspected UTI*

*Requires a nurse visit in the clinic for point-of-care testing

*Any patient with chest pain, shortness of breath, abdominal pain, high fever, extreme weakness, or severe headache should not be offered a telehealth appointment

*Any patient who is deemed inappropriate or requiring an in-person exam is sent to the clinic for an evaluation with the on-site provider at no additional charge

The American Medical Association’s “Telehealth Implementation Playbook” guided the project's planning phase (Am. Medical Assoc, 2022). The VIC service is available for all four Immediate Care sites to book appropriate patients. Patients can also book appointments directly by telephone from home. Primary care triage nurses can also directly book VIC appointments. However, this project specifically tracked the volume of patients booked from the single project site to offload clinic volume. Since the beginning of the project, VIC providers have reported daily population-level outcomes, and the team met frequently to analyze these outcomes and plan for problem-solving and further PDSA cycles.

The Virtual Immediate Care (VIC) team met weekly for the first eight weeks, then bi-weekly for four weeks, then monthly as of September 1st, 2023. Daily reporting of virtual outcomes included patient volume, the reason for visit, how the patient was booked for the appointment (direct booking, PCP office book, or Immediate Care clinic booking to offload clinic volume), how many virtual patients required conversion to an in-person visit, any diversions from scheduling guidelines, and reporting on antibiotic stewardship. This was shared with the VIC team weekly for review.

Many VIC patients require in-clinic point-of-care testing, such as strep or urine tests, so nurse visits were required to accommodate this. There was much confusion and variation in
communication around the nurse visits for several weeks at the beginning of the project. Part of the confusion was variability in what the virtual providers expected because they were not included in nurse staff meetings during planning, and several virtual providers came from other organizations with established workflows for testing, so these providers expected the same workflow they were accustomed to.

Another hurdle was deciding how the off-site provider would communicate electronically with clinic staff on a secure platform. The Voalte secure messaging app was selected to facilitate secure communications between staff about appointment information and results. Many staff members needed assistance setting up their Voalte accounts and complained that the alerts from the app were annoying and disruptive when focusing on in-clinic patients. Staff needed to be frequently reminded that they were not being given “extra work” with the addition of the telehealth service because these patients would have typically been there for an entire visit. Nursing staff found this workflow challenging when daily volumes went up, but in individual discussions, they support the program and understand it is helping to improve workflow.

Virtual providers also needed training about the telehealth platform, best practices in conducting a telehealth visit, laws and regulations around telehealth, scheduling nurse visits and ordering tests, and how results would be handled and communicated to patients. While the VIC service is part of the Immediate Care division, separate scheduling, documentation templates, order sets, and billing templates all needed to be created and revised.

The marketing department ran several ad campaigns about the VIC service by email, social media, in-clinic posters, and patient fliers. The team visited community events in the surrounding neighborhoods to inform people about the VIC service. The DNP student also presented the VIC service at department meetings for Primary Care, and the project outcomes were presented at the annual hospital-wide quality symposium. A recorded presentation for
schedulers about best practices to screen for telehealth-appropriate visits was created, with tips for effectively approaching patients about virtual visits as an alternative to in-clinic care. Education was necessary because many staff and patients had never had a virtual visit before and were unsure what to expect.

**Fast-Track Appointments**

Based on the ED Split flow model (Berg et al., 2020; Breen et al., 2020; DeFreitas et al., 2018), the in-clinic Fast-Track workflow was introduced in August 2023. The model was introduced to staff at morning huddles, and a detailed process map was created with staff input (Appendix D). During a fast-track appointment, both the nurse and the provider room the patient simultaneously, cutting down total visit time by eliminating the typical six to eight minutes it takes for a nurse to room a patient and the time the patient usually sits in the room waiting for the provider after the nurse finished rooming. The Fast-Track model also eliminates duplication of data collection and improves communication and teamwork.

However, this workflow is logistically quite complex when there are many patients in the clinic because the provider is often seeing a patient when the nurse brings the fast-track eligible patient to the exam room. When a provider cannot come in during triage and rooming, typically on higher volume days, less time is saved. There are usually more nursing staff than providers, so it is impossible to always tandem-room patients.

When a provider is unavailable during rooming, nursing identified these patients as fast-track eligible, and the provider prioritized the appointment to keep exam rooms moving. Although this workflow was imperfect due to logistics, there was a significant improvement in door-to-door time when the model was used, and patients also appreciated having both the provider and the nurse in the exam room simultaneously.
Cycle times were reviewed for fast-track eligible appointments. There were modest improvements in cycle times when comparing pre-and-post-project cycle times for fast-track-eligible patients (Figure 9). There was improved communication between staff and patients, with some reporting that they appreciated being more involved in the decision-making process. In contrast, some nurses felt it slightly slowed them down because the provider asked additional questions during rooming.

Figure 9.

Average Door-to-Door Times for Fast-Track Eligible Diagnoses

![Average daily volume and visit times for fast-track appointments](image)

**Cycle Time Outcomes and Statistical Analysis**

Pre-and-post-project clinic cycle times were compared by mean and standard deviation and two sample pooled t-tests, with a 95% confidence interval (Table 7). There was a significant difference between the pre-and-post-visit cycle times for all categories. Door-to-door time improved by 26.1% (66 min. to 48 min). (P<.0001). Waiting room time improved by 56% (25
min. to 11 min.) (P<.0001). Net Promoter Score improved by 12.5% (68% to 77%). Patients completing their visit in ≤ 60 minutes improved by 30.5% (55% to 72%). 6.4% of the patients who came in for care were booked for telemedicine visits, improving volume capacity. Figure 10 demonstrates an improvement in the percentage of visits completed in 60 minutes or less during the project period.

Table 7.

<p>| Outcome Statistics for Time in the Waiting Room, Door-to-Door Time, Avg Daily Volume Pre/Post |</p>
<table>
<thead>
<tr>
<th>Door-to-Door Time</th>
<th>Mean</th>
<th>S.D.</th>
<th>St err mean</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Project</td>
<td>66.00 min</td>
<td>37.9</td>
<td>0.462</td>
<td>65.09</td>
<td>66.9</td>
</tr>
<tr>
<td>Post Project</td>
<td>47.67 min</td>
<td>25.62</td>
<td>0.329</td>
<td>48.01</td>
<td>49.39</td>
</tr>
<tr>
<td>Waiting Room Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Project</td>
<td>25.11</td>
<td>28.65</td>
<td>0.349</td>
<td>24.42</td>
<td>25.79</td>
</tr>
<tr>
<td>Post-Project</td>
<td>11.04</td>
<td>11.52</td>
<td>0.148</td>
<td>10.75</td>
<td>11.33</td>
</tr>
<tr>
<td>Average Daily Volume</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Project (6718)</td>
<td>47.29</td>
<td>10.18</td>
<td>0.12</td>
<td>47.05</td>
<td>47.53</td>
</tr>
<tr>
<td>Post-Project (6049)</td>
<td>43.43</td>
<td>7</td>
<td>0.09</td>
<td>43.25</td>
<td>43.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pooled T-test</th>
<th>Std err diff</th>
<th>T-ratio</th>
<th>alpha</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door-to-Door</td>
<td>17.24</td>
<td>0.57</td>
<td>29.76</td>
<td>0.05</td>
</tr>
<tr>
<td>Waiting Room</td>
<td>14.07</td>
<td>0.39</td>
<td>35.68</td>
<td>0.05</td>
</tr>
</tbody>
</table>
Figure 10.

**Volume, Visit Cycle Time, and Percent of Visits Completed within 60 minutes**

The organizational target of 70% of patients completing their appointment within 60 minutes was met when clinic volume ranged from 39 to 42 patients per day. The pre-project period saw 29% to 70% of patients completing their appointment within an hour when daily volumes ranged from 42 to 55 patients per day (Figure 11).

Reducing non-value-added visit time was a primary aim of this DNP project. Between December 2022 and April 2023, prior to the start of the project, the median time patients sat in the outer waiting room was 25 minutes. Between May 2023 and September 2023, the median waiting room time fell to 11 minutes.

Time spent in an exam room has less non-value-added time than waiting in a waiting room. Time in the exam room remained similar when comparing the five months before the
project with the project months, averaging 41 minutes in the pre-project period and 38 minutes during the project (Figure 11).

**Figure 11.**

**Pre/Post Project Outcomes Comparing Dec’22-April’23 with May’23-Sept ‘23**

Clinic cycle times are strongly influenced by lower in-clinic volume and account for part of the improved metrics reported in this project. However, we cannot discredit that some patients who presented for care were seen virtually during the project period, essentially offloading clinic volume, and by managing the in-clinic volume through an alternate form of care access, the cycle times improved. If those patients had been seen in the clinic instead, this would have added 6 to 11 patients per day on average. While it is unclear exactly how much time is saved per day by moving some patients to virtual appointments, it is clearly demonstrated that target visit times were more easily met when the volume of patients seen in the clinic was controlled.

NPS also showed improvement during the project period. While NPS can be affected by factors outside of the control of clinic operations, historically, NPS scores are higher during months when the volume is lower, and patients can get in and out more quickly. In the pre-
project period, monthly NPS ranged from 62% to 73%, and during the project, 67% to 91.5% (Figure 12). This change reflects a modest 12.5% improvement. However, even in the pre-project period, the monthly NPS scores were nearly at the 70% target (Appendix B).

**Figure 12.**

*Monthly NPS score, Median In-clinic Daily Volume, and Percent Booked for Virtual Appointment to Offload Clinic Volume*

![Figure 1](image.png)

**Semi-Structured Interviews of Staff**

A semi-structured interview to better understand staff perceptions of the interventions was conducted with a convenience sample of twelve random multidisciplinary staff in the final month of the project (Table 8). Roles included the center manager (1), the assistant manager (1), patient service representatives (2), medical assistant (1), nurses (5), and providers (2).
Table 8.

Staff Interview Questions

<table>
<thead>
<tr>
<th>Question</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Consider the workflow and efficiency of room turnover and appointment times compared to 6-12 months ago. Have you noticed any changes?</td>
<td></td>
</tr>
<tr>
<td>2. Has the addition of VIC impacted the workflow in the clinic? Please describe.</td>
<td></td>
</tr>
<tr>
<td>3. Describe if the virtual appointments have impacted clinic efficiency.</td>
<td></td>
</tr>
<tr>
<td>4. Fast-tracking appointments for low-acuity patients were introduced in the past few months. If you have used the fast-track approach, describe your observed experience with patients and staff.</td>
<td></td>
</tr>
<tr>
<td>5. What would you recommend if you could make any changes to improve the workflow?</td>
<td></td>
</tr>
<tr>
<td>6. Is there anything else that you would like to share with me?</td>
<td></td>
</tr>
</tbody>
</table>

Table 9.

Major Themes and Sub-Themes from Semi-Structured Interviews of Multidisciplinary Staff

<table>
<thead>
<tr>
<th>Major Themes</th>
<th>Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Satisfaction</td>
<td>Convenience</td>
</tr>
<tr>
<td></td>
<td>Cycle Times</td>
</tr>
<tr>
<td>Patient Acuity and Volume</td>
<td>Efficiency</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
</tr>
<tr>
<td>Workflow</td>
<td>Care Coordination</td>
</tr>
<tr>
<td></td>
<td>Triage</td>
</tr>
<tr>
<td>Variation in staff work habits and experience level</td>
<td>Burnout</td>
</tr>
<tr>
<td></td>
<td>Staff Experience</td>
</tr>
<tr>
<td>Workforce</td>
<td>Staffing</td>
</tr>
<tr>
<td></td>
<td>Technology</td>
</tr>
<tr>
<td></td>
<td>Administration/Finance</td>
</tr>
<tr>
<td>Teamwork</td>
<td>Communication</td>
</tr>
</tbody>
</table>

Major themes were identified, including patient satisfaction, patient acuity, and volume, workflow, variation in staff work habits and experience level, workforce, and
teamwork (Table 9). Subthemes included convenience, cycle times, efficiency, environment, care coordination, triage, burnout, staff experience, staffing, technology, administration/finance, and communication. Staff supported the workflow changes but also reported disruptions in nurse visit workflow, testing of telehealth patients, telemedicine scheduling issues, and feeling burned out.

**Table 10.**

**Thematic analysis and examples of Semi-Structured Interviews of 12 Multidisciplinary Professionals to Understand Perspectives of the New Models of Care.**

<table>
<thead>
<tr>
<th>Semi-structured Interviews of Staff Summary: n=12, nurse (5), PSR (2), Provider (2), Manager (2).</th>
<th>Thematic Analysis of Field Notes Themes and Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major Themes</strong></td>
<td><strong>Specific comments</strong></td>
</tr>
</tbody>
</table>
| Teamwork                                                                                        | “Acuity some days is overwhelming. This slows us down.”  
“If several fast-track patients come in around the same time, they cannot all be fast-tracked because we do not have the staff or space.” |
| Variability in patient acuity and volume                                                         | “Fast-track works great if both people can room the patient.”  
“We are doing a better job moving patients through the clinic.”  
“If we did not have the virtual option, we would be busier and probably slower depending on acuity.” |
| Workflow                                                                                        | “I hate the voalte messaging app for virtual appointments. Another thing to pay attention to.”  
“Virtual nurse visits disrupt in-clinic flow.”  
“It is not feasible for virtual patients to be seen in an exam room.  
We do not have enough exam rooms.”  
“Have all virtual providers follow up with their patients about the POC test result. Asking us to do it when busy in the clinic makes it disruptive.” |
| Teamwork                                                                                        | “It depends on who is working. Some providers are very needy. Some do way more testing than others. It is not consistent.”  
“I think we are doing as good of a job as possible.” |
**Section IV. Discussion**

**Summary**

The project’s key findings demonstrated a decrease in non-value-added time in the clinic, evidenced by significantly improved cycle times through a combination of fast-track appointments and offering low-acuity patients the option of a telemedicine visit at a non-emergency walk-in clinic.

This mixed-methods quality improvement project aimed to improve access to timely care, starting with an extensive literature review on best practices around patient flow. The project used the Dartmouth Microsystem Improvement approach (Nelson et al., 2011) and lean Six Sigma strategies to assess pre-project workflows, establish goals, and plan for project implementation. It used a team-based approach where workflow decisions were made by the group of individuals working within the environment. This gave frontline staff a sense of ownership and interest in the project.

This small quality improvement project did not control for all potential variables that could impact cycle times and net promoter scores. However, the reported improvement in
outcomes was partly due to the implementation of the on-demand virtual immediate care service and improved workflows with fast-track appointments and proactive care coordination.

Interpretations

In the literature review, previously published works on workflow redesign and on-demand telemedicine reported similar outcomes. The outcomes reported were likely due to a combination of interventions and potentially other factors that were not controlled for, such as staff experience level, patient acuity, and seasonal variation in the types of health concerns seen. Project objectives were met with a team-based approach, frequent review of project targets, and continuous monitoring of outcomes to guide further PDSA cycles.

The project also provided the added benefit of improved teamwork and motivation to improve work efficiency. However, staff continued to articulate issues and ideas for improvement about workflow and feelings of burnout at the end of the project. There was consensus on workflow improvement and renewed interest in continuing teamwork to create the best possible work environment within system constraints.

Limitations

During the interviews, several staff members reported their ongoing feelings of burnout and dissatisfaction with different aspects of their work. The COVID-19 pandemic made working in a walk-in clinic extremely stressful, and many staff have not fully recovered from the trauma of the pandemic. However, consulting with staff about their opinions and ideas around workflow brought energy and interest to the team in improving working conditions. Open-ended conversations with a trusted staff member who brought their voice to department meetings and administration helped staff feel heard and appreciated. Sharing the project's outcomes also brought a celebratory spirit to the team, who expressed pride in their accomplishments.
Some staff reported that patient acuity has also increased noticeably because the “easiest” patients are now seen virtually. While this was an expected outcome, staff also acknowledged that virtual patients would have typically also needed to be seen in the clinic, so although more complex patients are seen, there are fewer patients overall.

The fast-track appointment workflow was created with the lead resource RN, the day-to-day champion of this workflow. Unfortunately, the lead resource RN accepted another job opportunity as the fast-track workflow started. Not having a lead RN diminished staff interest in the rollout of this portion of the project. It led to less utilization of the workflow than initially expected. The fast-track workflow was logistically challenging to coordinate due to system constraints when there was high patient volume. Regardless, there was an improvement when cycle times for fast-track eligible diagnoses were compared with pre-project cycle times of the same diagnoses.

Financial Considerations

Basing salaries and the potential for incentive bonuses on patient volume and complexity of care through relative value units (RVUs) is controversial and can easily lead to healthcare provider burnout (Nurok, 2019). The RVU-based model encourages providers to extend themselves by seeing more patients or performing more procedures rather than focusing on effective management and cost containment. In the past 10-15 years, reimbursement models have shifted towards value-based care with integrated practice units that work together to produce the best outcomes for patients (Lee & Porter, 2013). A shift in how healthcare providers are evaluated for their effectiveness and cost savings, such as avoiding a patient visit to the emergency department or providing adequate workup to prevent multiple follow-up visits is overdue.
RVUs are calculated based on patient acuity, whether the patient is new to the practice or established, the level of medical decision-making, and the time the provider took to coordinate the patient’s care (Nurok, 2019). Higher RVU volume reflects organizational profit. If a provider sees more than their base RVUs, there is an opportunity for a quarterly bonus payment. Because patients who are eligible for virtual appointments typically have low acuity, virtual visits are usually billed at a lower level of service than some patients seen in the office.

Because the project’s healthcare system budgets provider salaries (MD, NP, and PA) based on quarterly minimum relative value unit (RVU) targets, there were negative financial impacts of starting the new VIC service due to low patient volume in the first few months.

As with most new businesses, it took several months to build an adequate daily volume of virtual patients, resulting in the providers who chose to make virtual appointments part of their weekly schedule being unable to meet RVU expectations. Some providers were significantly below target at the end of the first quarter. As virtual patient volume gradually increased, this issue started to correct itself by the end of the project period. To compensate for the initial discrepancy, VIC providers were moved to clinic sites as solo providers or more busy sites on their in-clinic workdays to meet their expected RVUs. This caused dissatisfaction among virtual provider staff. The administration adjusted RVU expectations slightly to address this discrepancy, yet some remain in a negative RVU balance.

There was discussion about having the virtual provider work at one of the clinic sites in a private office and seeing some clinic patients if not all virtual appointment slots were booked to be able to meet RVU minimums. The administration ultimately did not support this idea because of concerns that this would set a precedent of expecting the virtual provider to perform two roles routinely on the same day. Additionally, if a virtual provider saw an in-clinic patient who
required more time than expected, this could cause bottlenecks in the virtual schedule and lead to patient dissatisfaction.

**Conclusions**

The project demonstrated improved cycle times and NPS scores compared to the pre-project period. Simultaneous quality improvement activities such as standardizing nursing workflow, hiring additional staff, and organizing the environment also contributed to these positive findings. These workflow changes improved exam room availability and decreased frequent in-clinic slowdowns during volume surges. While staff supported the new workflows, the clinic can still become chaotic with high hourly volume and acuity fluctuations. Seasonal variation in patient volume is more effectively and efficiently met by offering telemedicine appointments to eligible patients and improving care coordination in the clinic through fast-track appointments.

Daily patient volume and acuity also had a significant influence on cycle times. While a slightly higher in-clinic volume during the pre-project period could partly explain the longer cycle times, we cannot discount the positive effect of controlling the in-clinic volume with on-demand telemedicine.

Many PDSA cycles and issues arose during the rollout of the new VIC service. Despite a slow start, starting the service in the summer months was ideal to allow more time for workflows to become established. There was also significant resistance to change among some staff. However, over time, more staff embraced the telemedicine service to manage their workload and improve efficiency.

This was a 16-week quality improvement project. A more extended project expanded to all sites to better account for seasonal variations, patient demographic variability, workflow variation across sites, and staff experience should be explored. From a microsystem perspective,
the project raised issues specific to healthcare finance models and conflict related to innovation and “value-based” care rather than volume-based budget models (Lee & Porter, 2013). More innovation, budget, and policy conversation with leaders at all levels may help promote value-based care to meet population needs, enhance multidisciplinary providers’ practice, and optimize education, training, and licensing with new care delivery models. It may lead to decreases in staff burnout.

Due to the brevity of this project, seasonal variations in volume and acuity were not evaluated, limiting its generalizability. Additional studies over time that control for other factors influencing cycle times are indicated.

**Funding**

The clinical agency did not budget funds for data collection and analysis of this project. The project activities did not overlap with the job duties of the DNP student. Costs were minimal, including paper and copying to display project outcomes and the travel costs for the DNP student for project implementation.
References


IMPROVED PATIENT FLOW IN A NON-EMERGENCY WALK-IN CLINIC


Random house business books.


https://www.ihi.org/resources/Pages/ImprovementStories/ShorteningWaitingTimesSixPrinciplesforImprovedAccess.aspx


**Search Criteria:**

Appendix A.

Global and Specific Aim worksheet (from: www.clinicalmicrosystem.org)

**GLOBAL AIM, FLOWCHART AND SPECIFIC AIM STATEMENTS WORKSHEET**

**WRITE A THEME FOR IMPROVEMENT**

Improve access to timely care in the Immediate Care Department

**DEVELOP A GLOBAL AIM STATEMENT**

Assess patient flow in the Immediate Care clinic and identify strengths, weaknesses, and opportunities for improved patient flow

**We aim to improve the following:**

- Access to care by reducing non-value-added time in the Immediate Care clinic, which will decrease appointment times and create additional room for higher patient volumes.
- Workflow processes: registration, triage, rooming, documentation, and efficiency of workflows.

**The process begins with:**

- Identifying inefficient processes that cause delays and non-value-added time in the Immediate Care
- Using a team approach to standardize rooming processes and documentation.
- Using a team approach to create a fast-track protocol for low-acuity patients.
• Measuring outcomes from the new VIC service and how it impacts the in-clinic flow.

• Using PDSA cycles to improve patient flow.

• Monitor and report monthly net promoter scores and staff feedback about workflow redesign.

The process ends with the following:

• Patients receiving evidence-based care in a timely manner.

• After identifying redundant and inefficient processes, workflow changes were implemented to decrease wait times and total visit time for high-volume/low-acuity patients and increase or maintain monthly net promoter scores.

By working on the process, we expect the following:

• Improved staff satisfaction

• Decreased wait times and cycle times

• Improved Net promoter score with a goal of 70 or higher

• Improved communication with team members

It is important to work on this now because:

• Staff turnover due to decreased satisfaction, feeling a lack of autonomy, and working in a chaotic environment further disrupts patient flow by leaving clinics inadequately staffed.

• Patient complaints and decreased satisfaction with care due to long wait times during high-volume time of year
• Monthly net promoter scores predictably dip during high-volume seasons (fall, winter, and early spring).

• Patients unsatisfied with their care are less likely to return or refer friends and family and are more likely to provide negative reviews online.

• Implementing this project during the summer, when volumes are historically lower, allows additional time for planning and teamwork to be prepared for increased volumes in the fall.

• This project is also an excellent time to implement because of the new resource RN lead role and the new telehealth immediate care service.
Appendix B:

NRC “Patient Satisfaction of Care” Survey is Sent Randomly to Adult Patients Seen in the Clinic and Reported Monthly

NPS Score Pre and Post Project
(Target >70)

DEC’22 JAN’23 FEB’23 MAR’23 APR’23 MAY’23 JUNE’23 JULY’23 AUG’23 SEPT’23
Appendix C.

Root-Cause Analysis of Factors that Increase Demand for Same-Day Evaluation and Lengthy Appointment Times

Long wait times and average immediate care visit total time greater than 60 minutes
Appendix D. Workflows

Current workflow with proposed changes: Fast track appointments and VIC scheduling

**Workflow Change #1: Add Fast Track**

**Workflow Change #2: Telemedicine Scheduling**
Appendix D. Workflows
In-Depth Fast-Track Appointment Workflow

Fast-track eligible:
- Uncomplicated UTI
- Sore throat/suspected strep
- Insect bite or uncomplicated rash (poison ivy)

Exclusions:
- Children under 2yo
- Frail/elderly patients
- Patients with other significant symptoms

Walk-in patient requests in-person visit

Registration:
- Insurance, copay, demographics
- Preferred pharmacy and lab
- Reason for visit documented in "notes" section
- Screened for high acuity problems

Patient waits in lobby

High Acuity? (Reviewed by RN)

Yes
- Roomed immediately

No
- Provider evaluates.

Patient is roomed per usual process

Fast-Track Provider Available?

Yes
- Roomed per usual process

No
- Fast-Track Eligible?

Yes
- Roomed per usual process

No
- RN and Provider room patient together

HPI, vitals, allergies/meds, exam
RN starts POC testing in exam room

RN/MA rooms patient, performs POC tests.

RN/MA underlines name on tracking board to identify as "Fast-Track", alerting provider to see patient ASAP

Provider determines plan of care, orders meds, tests, etc. AVS printed.

Provider prioritizes patient exam, determines plan of care, orders meds, tests, etc. AVS printed.

Patient discharged

Patient discharged

ED transfer?

Yes
- Stabilize and prepare for transfer. Call report to ED.

No
- Patient leaves via EMS or personal vehicle.

HPI, vitals, meds, POC testing, etc. Provider evaluates. Patient stabilized. Await test results.

Patient awaits provider

Provider determines plan of care, orders meds, tests, etc. AVS printed.

Patient discharged

Provider determines plan of care, orders meds, tests, etc. AVS printed.

Patient discharged

Patient leaves via EMS or personal vehicle.
Appendix D. Workflows
Fast-Track Appointment Workflow

Workflow Change #1: “Fast Track” Appointments

Registered at front desk:
- FSR Insurance, Co-pay, Demographics reviewed
- Pharmacy and preferred lab verified.
- Screened for high acuity problems.

Patient waits in waiting room

Patient waits in waiting room

High Acuity? Yes

Immediate triage by nurse/provider.

Stabilized

Diagnosed and reports to EMS and ED by Provider.

Patient Transferred to ED

Wait for provider and POC result

Evaluation by provider (MD, DO, NP, or PA)

Additional Labs ordered

Yes

Labs done by Nurse and Resulted

Order for Radiology placed

Yes

Radiology needed

Procedure needed

No

Procedure performed

Provider does consent and sets up procedure

DME Needed

DME

Yes

Nurse applies DME

Provider Implants:
- Plan of care
- Care coordination
- Follow up
- Prescriptions
- Testing

Yes

Patient waits for provider to return with discharge instructions

Patient discharged from clinic

Fast Track Eligible:
- Age 5 to 74
- Simple UTI (no fever, female, non-pregnant, no mid-back pain
- Strep test/Sore throat
- Sinus symptoms only
- Simple rash (no other symptoms)
- Cold symptoms (no fever or shortness of breath)
Appendix D. Workflows
Virtual Immediate Care Scheduling:

Workflow Change #2: Telemedicine Scheduling

Patient wants care

Patient calls Immediate Care

Pl. Walks into Immediate Care

Virtual appropriate

Pl. offers virtual visit

Advised to come in for appointment

Booked by PSR

Pt. goes to clinic to be seen

Pt. scheduled for Virtual Visit

Pt. goes to IC site

Pt. scheduled for Virtual Visit

Patient seen in person

Virtual provider scans schedule and contacts clinic, asks RN to offer virtual appointment

4 ways patients can be scheduled for virtual appointments:
- Direct from PCP Office (by phone)
- Calling Immediate Care (IC) line and booking with the PSR over the phone
- Being offered virtual appointment when they check in at registration
- “Level Loading” - RN in clinic offers patients if wait is less than 1 hour, OR
### Outcomes from Semi-structured Interviews of Multidisciplinary Staff: Perceptions of Workflow Changes

<table>
<thead>
<tr>
<th>Semi-structured Interview Question:</th>
<th>Themes identified</th>
<th>Sub-themes</th>
<th>Endorsing Statements</th>
<th>Neutral Statements</th>
<th>Detracting Statements</th>
</tr>
</thead>
</table>
| Consider the workflow and efficiency of room turnover and appointment times in IC. Compared to 6-12 months ago, have you noticed any changes? | Teamwork Variations in staff and work habits Variation in volume and acuity | • Appointment Cycle Time  
• Burnout  
• Care Coordination  
• Communication  
• Efficiency  
• Environment  
• Staff Experience Level  
• Stress management  
• Staffing  
• Triage | 19 | 3 | 19 |
| Has the addition of VIC impacted the workflow in the clinic? Please describe.                      | Patient Satisfaction Teamwork Workflow                                                                                     | • Appointment Cycle Time  
• Care Coordination  
• Communication  
• Convenience  
• Efficiency  
• Staff Experience level  
• Quality | 8 | 1 | 18 |
| Describe if the virtual appointments have impacted clinic efficiency.                             | Variation in Volume and Acuity Workflow                                                                                   | • Care Coordination  
• Communication  
• Efficiency  
• Environment  
• Technology  
• Triage | 11 | 2 | 3 |
| Fast-tracking appointments for low-acuity patients has been introduced in the past few months. If you have used the fast-track approach, describe the impact on patients and staff. | Patient Satisfaction Teamwork Workflow                                                                                   | • Appointment Cycle Time  
• Burnout  
• Care Coordination  
• Communication  
• Efficiency  
• Staff Experience level  
• Stress Management  
• Triage | 9 | 11 | 7 |
If you could make any changes to improve the workflow at ICSN, what would you recommend?

| Teamwork Workflow Workforce | Admin/Finance issue • Burnout • Care Coordination • Communication • Efficiency • Environment • Stress Management • Staffing • Technology | 6 | 8 | 4 |

Is there anything else that you would like to share with me?

| Teamwork Workflow Workforce | Admin/Finance • Burnout • Environment • Staffing • Technology | 0 | 3 | 9 |

Consider the workflow and efficiency of room turnover and appointment times in IC. Compared to 6-12 months ago, have you noticed any changes?

<table>
<thead>
<tr>
<th>Answer</th>
<th>#</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients are not sitting in the waiting room as long</td>
<td>4</td>
<td>Workflow</td>
</tr>
<tr>
<td>We have a pretty good team that works together. We have improved our teamwork.</td>
<td>3</td>
<td>Team Work</td>
</tr>
<tr>
<td>It depends on the day. Some people have different work habits (Providers and Nurses).</td>
<td>4</td>
<td>Variation in staff work habits</td>
</tr>
<tr>
<td>It depends on how busy it is, how acute the patient is, and who is working, but overall, I think there is some improvement.</td>
<td>4</td>
<td>Variation in acuity and volume Variation in staff work habits</td>
</tr>
<tr>
<td>Acuity some days is overwhelming. Much higher than during the height of covid. This slows us down.</td>
<td>6</td>
<td>Variation in acuity and volume</td>
</tr>
<tr>
<td>Patients seem happier with shorter appointments</td>
<td>2</td>
<td>Patient Satisfaction</td>
</tr>
<tr>
<td>We are doing a better job of moving patients through IC faster.</td>
<td>8</td>
<td>Workflow</td>
</tr>
<tr>
<td>Putting X-rays back in the waiting room helps to keep things moving</td>
<td>2</td>
<td>Workflow</td>
</tr>
<tr>
<td>It depends on who is working. Some providers are very needy. Some do way more testing than others. It is not consistent.</td>
<td>5</td>
<td>Variation in staff work habits</td>
</tr>
<tr>
<td>Some nurses do not document in the exam room. They go back to their desk to write things up. This adds another step.</td>
<td>2</td>
<td>Variation in staff work habits</td>
</tr>
</tbody>
</table>
We are not as busy because there are fewer COVID-19 patients, but we seem to get more complicated patients.  

**Variation in acuity and volume**

### Has the addition of VIC impacted the workflow in the clinic? Please describe.

<table>
<thead>
<tr>
<th>Answer</th>
<th>#</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is nice to have the option of virtual appointments when we are busy.</td>
<td>4</td>
<td>Workflow</td>
</tr>
<tr>
<td>The patients who need a nurse visit disrupt what we are doing in the clinic. Since the assistant mgr. started doing the virtual nurse visits recently, though it is better.</td>
<td>4</td>
<td>Workflow</td>
</tr>
<tr>
<td>I hate the voalte messaging app. Having to pay attention to another thing that is not immediately in front of me, like a patient or a co-worker</td>
<td>1</td>
<td>Workflow</td>
</tr>
<tr>
<td>It is harder to book virtual appointments because I must switch the context on the computer and look to see how many patients are already booked. It would be easier if I could see both the IC screen and the Virtual booking screen simultaneously.</td>
<td>2</td>
<td>Workflow</td>
</tr>
<tr>
<td>I do not see why we needed virtual appointments. I think patients who come in would rather be seen in person. I know it is a convenience and time-saver, but it makes more sense just to call in and ask for a virtual visit than be offered one at the desk.</td>
<td>3</td>
<td>Workflow</td>
</tr>
<tr>
<td>It would be easier if we did not have nurse visits for testing.</td>
<td>5</td>
<td>Workflow</td>
</tr>
<tr>
<td>I sometimes think that patients feel they did not get the same level of care by choosing a virtual visit</td>
<td>3</td>
<td>Patient Satisfaction</td>
</tr>
<tr>
<td>It is a real help when we get a big rush of patients</td>
<td>4</td>
<td>Workflow</td>
</tr>
<tr>
<td>I ignore those seen virtually unless they get sent in for an in-person visit because of a concern identified on the virtual.</td>
<td>1</td>
<td>Teamwork</td>
</tr>
</tbody>
</table>

### Describe if the virtual appointments have impacted clinic efficiency.

<table>
<thead>
<tr>
<th>Answer</th>
<th>#</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>We are more efficient when we have fewer patients to see per hour. If we did not have the virtual option, we would be busier and probably slower, depending on acuity.</td>
<td>3</td>
<td>Workflow</td>
</tr>
<tr>
<td>Patients who do not need point-of-care testing and are seen virtually are the easiest because we do not see them.</td>
<td>5</td>
<td>Workflow</td>
</tr>
<tr>
<td>Patient acuity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It is not feasible for virtual patients to be seen in an exam room. We do not have enough space. They need to be seen in their cars or at home.

| It think we are doing as good of a job as we can. When we are busy, I am not thinking of anything other than what is in front of me. | 2 | Variation in acuity and volume |
| Being able to book some of these patients virtually has made a difference because we do not see as many in the clinic. But it means that we are seeing more acutely ill patients in person. | 3 | Workflow |

**Fast-tracking appointments for low-acuity patients were introduced in the past few months. If you have used the fast-track approach, describe the experience for patients and staff.**

<table>
<thead>
<tr>
<th>Answer</th>
<th>#</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think it works great if both people are available</td>
<td>3</td>
<td>Workflow Variation in work and staff work habits</td>
</tr>
<tr>
<td>It improves communication, and we get things done faster</td>
<td>4</td>
<td>Improved workflow Teamwork</td>
</tr>
<tr>
<td>Fast track only works sometimes. Often, the provider is not available.</td>
<td>6</td>
<td>Workflow Variation in work and staff work habits</td>
</tr>
<tr>
<td>Some providers do not even try to fast-track. They do not see the point, maybe.</td>
<td>4</td>
<td>Workflow Teamwork</td>
</tr>
<tr>
<td>If several fast-track patients come in around the same time, they cannot all be fast-tracked</td>
<td>3</td>
<td>Workflow Variation in acuity and volume</td>
</tr>
<tr>
<td>If there is an acute patient, we must focus on them first.</td>
<td>2</td>
<td>Variation in acuity and volume</td>
</tr>
<tr>
<td>I think it would work better if there were a formal triage nurse and process that happens at check-in. However, people would get upset if someone is taken to a room sooner than if they came before them. But when we are in sync, I can see that the appointment moves along quicker</td>
<td>2</td>
<td>Workflow Variation in volume and acuity Patient Satisfaction</td>
</tr>
<tr>
<td>What is fast-track? I have not heard of this before</td>
<td>3</td>
<td>Teamwork</td>
</tr>
</tbody>
</table>

**What would you recommend if you could make any changes to improve the workflow?**

<table>
<thead>
<tr>
<th>Answer</th>
<th>#</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empower nurses to make decisions about triage and lab testing</td>
<td>2</td>
<td>Teamwork</td>
</tr>
<tr>
<td>Make it so I can see both the in-clinic schedule and the telemedicine scheduled simultaneously on my scheduling screen</td>
<td>1</td>
<td>Workflow (Tech)</td>
</tr>
<tr>
<td>Do away with virtual nurse visits, or always have the assistant manager here to do them. Being pulled to do virtual testing disrupts my flow</td>
<td>2</td>
<td>Workflow</td>
</tr>
</tbody>
</table>
More staffing | 6 | Workforce

I think we are doing as good as we can now. It is certainly better than 1 or 2 years ago. This environment is chaotic. | 3 | Workforce Workflow

I can see that the virtual appointments are helping with workflow. I just think it would be better if we had more space and staff so we could handle more in the clinic instead of making people see the virtual provider in their car | 1 | Workflow Workflow

A nurse protocol for virtual testing so we can swab them when they register, then send them home to do their virtual visit | 1 | Workforce Workflow

Have all virtual providers follow up with their patients about the POC test result. Asking us to do it when busy in the clinic makes it disruptive. | 2 | Workflow Workflow

---

Is there anything else that you would like to share with me?

<table>
<thead>
<tr>
<th>Answer</th>
<th>#</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>I wish we could all be on the same page with our workflow and work habits. It is frustrating that some people are so slow, and I feel like I have to pick up their slack when it is busy.</td>
<td>2</td>
<td>Workforce Workflow Workflow</td>
</tr>
<tr>
<td>We do not have enough workspace. We should have two more exam rooms. The lab should be moved next door, and we should redesign it to include the lab space. That would make a huge difference.</td>
<td>3</td>
<td>Workflow Workflow</td>
</tr>
<tr>
<td>The Barre studio next door plays their music too loud</td>
<td>3</td>
<td>Workflow Workflow</td>
</tr>
<tr>
<td>We need better insulation between the rooms. Too much can be heard outside of or between the rooms. The sound machines help, but then it is hard to hear with my stethoscope</td>
<td>1</td>
<td>Workflow Environment</td>
</tr>
<tr>
<td>Actual orientation period of new staff and yearly competencies on things we need to know and use</td>
<td>2</td>
<td>Workforce Teamwork</td>
</tr>
<tr>
<td>A clinical ladder or incentive</td>
<td>1</td>
<td>Workforce Workflow</td>
</tr>
</tbody>
</table>
Appendix F.

Statistical Summary of Pre-and-Post Cycle Times and Average Daily Volume

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>St err mean</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door-to-Door Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre Project</td>
<td>66.00 min</td>
<td>37.9</td>
<td>0.462</td>
<td>65.09</td>
<td>66.9</td>
</tr>
<tr>
<td>Post Project</td>
<td>47.67 min</td>
<td>37.9</td>
<td>0.5521</td>
<td>46.59</td>
<td>48.75</td>
</tr>
</tbody>
</table>

| Waiting Room Time    |        |      |             |           |           |
| Pre-Project          | 25.11  | 28.65 | 0.349       | 24.42     | 25.79     |
| Post-Project         | 11.04  | 11.52 | 0.148       | 10.75     | 11.33     |

| Average Daily Volume |        |      |             |           |           |
| Pre-Project (6718)   | 47.29  | 10.18 | 0.12        | 47.05     | 47.53     |
| Post-Project (6049)  | 43.43  | 7     | 0.09        | 43.25     | 43.6      |

<table>
<thead>
<tr>
<th></th>
<th>Pooled T-test</th>
<th>Std err diff</th>
<th>T-ratio</th>
<th>alpha</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door-to-Door</td>
<td>17.24</td>
<td>0.57</td>
<td>29.76</td>
<td>0.05</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Waiting Room</td>
<td>14.07</td>
<td>0.39</td>
<td>35.68</td>
<td>0.05</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
IMPROVED PATIENT FLOW IN A NON-EMERGENCY WALK-IN CLINIC

Means and Std Deviations Door-to-Door Time

<table>
<thead>
<tr>
<th>Level</th>
<th>Number</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Std Err Mean</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post</td>
<td>2339</td>
<td>47.677212</td>
<td>26.704024</td>
<td>0.5521558</td>
<td>46.594447</td>
<td>48.7599</td>
</tr>
<tr>
<td>Pre</td>
<td>6718</td>
<td>66.002084</td>
<td>37.945406</td>
<td>0.4629554</td>
<td>65.094544</td>
<td>66.9096</td>
</tr>
</tbody>
</table>
t Test: Pre-Post: Door-to-Door Cycle Times

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference</td>
<td>18.3249</td>
<td>25.4315</td>
</tr>
<tr>
<td>Std Err Dif</td>
<td>0.7206</td>
<td>5785.469</td>
</tr>
<tr>
<td>Upper CL Dif</td>
<td>19.7374</td>
<td>&lt;.0001*</td>
</tr>
<tr>
<td>Lower CL Dif</td>
<td>16.9123</td>
<td>&lt;.0001*</td>
</tr>
</tbody>
</table>

Oneway Analysis of “Time Waiting to be Roomed”

By A: Dec-April B: May-Sept
Means and Std Deviations

<table>
<thead>
<tr>
<th>Level</th>
<th>Number</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Std Err Mean</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post</td>
<td>6003</td>
<td>11.033483</td>
<td>11.534356</td>
<td>0.1488707</td>
<td>10.741643</td>
<td>11.325323</td>
</tr>
<tr>
<td>Pre</td>
<td>6717</td>
<td>25.114337</td>
<td>28.658751</td>
<td>0.349679</td>
<td>24.428855</td>
<td>25.799819</td>
</tr>
</tbody>
</table>

t Test: Pre-Post “Time Waiting to be Roomed“

|             | Difference | t Ratio | Std Err Dif | DF           | Upper CL Dif | Prob > |t| | Lower CL Dif | Prob > t |<.0001* |
|-------------|------------|---------|-------------|--------------|--------------|---------|---|----------------|----------|----------------|
| Difference  | 14.0809    | 37.0502 | 0.3800      | 9038.92      | 14.8258      | <.0001* |   | 13.3359        | <.0001*  |