Engaging Patients in the Completion of Deferred Care in the Ambulatory Setting

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Abstract

Despite several well-published recommendations, millions of individuals in the United States (U.S.) delay or defer recommended ambulatory preventive and chronic condition healthcare services (CDC, 2022). An opportunity exists to understand the effectiveness of ambulatory patient outreach strategies on the completion of recommended care. This program development and evaluation paper discusses the impact of an outreach pilot project targeting patients with uncontrolled hypertension in the completion of recommended care. The pilot included two arms of engagement intervention, a vendor-supported automated outreach in the Trinity Health Boise Idaho market and an internally-supported EHR bulk outreach messaging supplemented by an ambulatory nurse call line in the Trinity Health Southeast Michigan (SEMI) market. The evaluation compared the effectiveness of the two outreach pilots in engaging patients in the completion of recommended hypertension care. The analysis demonstrated 12.8% of the targeted Boise population scheduled and attended a primary care appointment after vendor-supported automated text outreach compared to a 44% appointment scheduling and attendance rate for targeted SEMI hypertension patients following routine outreach methods including email, electronic health record (EHR) portal messaging, and nurse telephonic calls. Statistically significant differences in the effectiveness of outreach by mode for specific age groups were identified. Patients aged 18-24 and age 75 and older scheduled follow-up appointments for hypertension care at greater rates after text outreach; patients aged 25-34 scheduled follow-up appointments for hypertension care at greater rates after phone outreach; and age groups between 35 and 74 all required a combination of one to three interventions including email, portal message, and telephone outreach to engage in scheduling and attending appointments. These program evaluation findings suggest consideration should be given to the mode of outreach by population age demographic to enhance the effectiveness of health system outreach interventions on patient engagement and completion of recommended care.

Introduction

Patient receipt of recommended preventive health and chronic condition care is a crucial factor in health promotion and maintenance. Delayed or deferred care in the ambulatory setting may result in an increased occurrence of preventable illness and increased risk of morbidity and mortality for patients with chronic conditions (Czeisler, et al., 2020). Despite several well-published recommendations, millions of individuals in the United States (U.S.) delay or defer recommended ambulatory preventive and chronic condition healthcare services. The Centers for Disease Control and Prevention (CDC) estimates "seven out of ten U.S. deaths are caused by chronic disease" including heart disease, cancer, and diabetes (CDC, 2022). In 2015, the Agency for Health Care Research and Quality (AHRQ) conducted a survey study that concluded "only 8% of U.S. adults received all recommended high-priority, appropriate clinical preventive services" (Borsky, 2018, para 1). Additionally, the CDC estimates that during the COVID-19 pandemic up to four in ten individuals deferred recommended ambulatory care including preventive and chronic condition services (Czeisler, et al., 2020). A clear opportunity exists to understand why recommended preventive and chronic condition healthcare services are being deferred. Such research would better inform ambulatory patient outreach and engagement strategies to support the receipt of recommended care. A further opportunity exists to study the most impactful methods of engaging patients, including using ambulatory nursing resources to enhance patient activation, self-management and care coordination that supports the completion of recommended care.

Background and Significance of the Problem

The American Academy of Ambulatory Care Nursing (AAACN) identifies the key role of nursing as "engaging patients in health promotion, disease prevention, and early intervention" (AAACN, 2016, para 3). Ambulatory nurses are uniquely positioned to understand the phenomena of deferred care as well as engage patients in the completion of recommended care. To promote efficient and effective patient outreach and engagement, it is important to understand the factors influencing patient decisions regarding deferred recommended care and

the healthcare delivery system barriers contributing to deferred care. Such knowledge can assist ambulatory care teams in the identification of patient populations that would most benefit from outreach strategies and ambulatory nursing interventions shown to improve the receipt of recommended care (Budde et al., 2021).

At the individual and healthcare delivery system levels, a variety of influencing factors contribute to deferred care. Several such factors were identified during the planning and development of the text outreach intervention pilot in Boise Idaho and subsequently evaluated for effectiveness in comparison to routine bulk outreach taking place in Southeast Michigan. The identified key influencers of deferred care included the healthcare delivery system structure; the care team's capacity to deliver evidence-based recommended care due to population demands; the availability of care delivery resources such as ambulatory staff and population health tools; the required ambulatory quality standards and reporting; and the organizational strategic priority to achieve excellence in ambulatory hypertension management.

Healthcare Delivery System Structure

Ambulatory primary care and care management services aimed at engaging patients in effective self-management, health promotion, and coordination of care are designed to contribute to improvements in individual and population health outcomes. The Primary Care Collaborative (PCC) is the foremost organization in advocating for efficient and effective healthcare delivery system structures through the implementation of patient-centered medical home (PCMH) concepts within the primary care setting. Healthcare delivery system structures target improvements in patient experience, quality metrics, and appropriate utilization which represent the goals of an "efficient and effective healthcare delivery system" as identified by the PCC (PCC, 2007, para 1). These concepts are a primary focus of ambulatory nursing leaders often responsible for the implementation of outreach and engagement strategies. Trinity Health executive leadership identified an opportunity to reengage patients in receipt of deferred care

post-pandemic and promote patient attribution and growth through ambulatory primary care visits. An assessment of current Trinity Health ambulatory patient outreach efforts demonstrated wide variation in system structure and operations. A standardized outreach effort to engage patients in receipt of recommended care presents an opportunity for Trinity Health to achieve desired growth and quality improvement outcomes and represents a demonstratable component of the efficient and effective health system design promoted by the PCC.

Hallmarks of the PCMH model describe a philosophy of primary care that is “patient-centered, comprehensive, team-based, coordinated, accessible, and focused on quality and safety” (PCC, 2007, para. 1). Partnering with patients and care teams to promote receipt of recommended care requires the establishment of trusting relationships with both the patient and the primary care team, coordinating care between providers and facilities, supporting patient participation in healthy behaviors and the effective self-management of chronic illness (Wagner, 1998). The Patient-Centered Medical Home (PCMH) serves as a model to assist primary care practice teams in identifying activities to understand the needs of the populations served, engage patients in receipt of recommended care, and use a team-based approach to deliver this care to achieve improved patient outcomes.

While the application of PCMH concepts supports the overall goals of population health, these concepts must be applied within the current clinical and financial operating model of the healthcare system and individual practice locations. Within the Trinity Health ambulatory primary care settings, there is variation in the ambulatory practice organizational structure including staffing models, as well as variability in operational processes such as appointment schedule access and the availability of population health management technology. These variations contribute to a lack of standardized workflow to support the routine identification of patients with upcoming or overdue recommended care and the application of resources to conduct outreach that engages patients in scheduling and completing recommended care. The application of the PCMH concepts, including identification of and outreach to populations with delayed or deferred

care, contributes to care gap closure and improved patient experience, quality, and cost outcomes.

Guideline Impact on Demand and Capacity

When working to identify patients with gaps in care who would benefit from outreach, demand and capacity assessments, supported by the Patient Medical Home construct (Daniel et al., 2013), are vital tools in ensuring efficient and effective practice operations are addressed. Any population health outreach effort must take into consideration the capacity to provide recommended care before patient outreach to ensure sufficient access, especially with the increased demands for urgent and acute care and care team staffing challenges amplified by the COVID-19 pandemic and endemic response.

The CDC and the United States Preventive Services Task Force (USPSTF) publish standard recommendations for preventive health, immunization, and chronic condition care to guide healthcare providers in the provision of recommended care. Such national guidelines can assist in modeling the expected demand for care based on the office practice panel demographics including age, sex, and diagnosis. The practice demand assessment also includes anticipated acute and urgent care needs of the population along with an analysis of practice staffing or capacity to ensure the practice has sufficient resources to support timely access and delivery of evidence-based care (PCC, 2007).

Practice Staffing and Technology Resources

While the capacity to provide timely and efficient care is impacted by the post-pandemic ongoing provider, nursing, and care team staffing shortages, it is important to note the long-standing ambulatory practice staffing and technology resource constraint that impacts patient outreach. Trinity Health ambulatory practices may not have staff dedicated to patient outreach

and currently utilize a variety of electronic health record (EHR) systems. Ambulatory practice sites may not have comprehensive population health management tools, such as patient registries or automated outreach solutions, to effectively identify and connect with patients who have upcoming and/or overdue care opportunities. While efforts are underway to implement the Trinity Health single instance of Epic TogetherCare, in all care settings across the organization's 25-state footprint, several ambulatory practice sites have yet to implement this technology and are using a combination of vendor-supported tools, homegrown informatics, and manual systems to manage population health.

For practices with sufficient dedicated resources and standard processes to conduct population health outreach, prioritized outreach efforts are conducted where only when capacity allows, and the criteria used are variable across regions. Outreach criteria may include prioritization of patients with overdue services before patients with upcoming recommended services; or prioritization of patients with care gaps who have multiple chronic conditions versus patients with a single chronic condition or well-managed chronic conditions. There is an opportunity to identify methodologies available for the most effective prioritized population outreach taking into account practice staff and technology resources.

Ambulatory Quality and Reporting

Trinity Health practices are accountable for the quality outcomes of the populations served through internal and external quality reporting. While Trinity Health ambulatory practices are utilizing a variety of operating models and tools to support population health management, all practices are accountable for the standard delivery of evidence-based care. Ambulatory outcomes data for recommended preventive health visits, immunizations, cancer screenings, and common chronic medical conditions such as hypertension, diabetes, chronic kidney disease, and heart failure are tracked by several national organizations using standard metrics. The foremost metric standards are managed by the National Quality Forum (NQF), National

Committee for Quality Assurance Health Effectiveness Data Information Sets (NCQA-HEDIS), and the Centers for Medicare & Medicaid Services (CMS). Performance is actively measured and monitored by Trinity Health, accreditation agencies, and commercial and governmental payers to track the effectiveness of population health management. Trinity Health utilizes current performance data to determine opportunities for improvement and prioritize improvement efforts. An example of a prioritized improvement effort is the ambulatory management of hypertension which became a national strategic priority for Trinity Health Medical Groups in 2019 and a natural fit for an ambulatory population outreach pilot to address deferred care.

Hypertension Management as a Strategic Priority

As part of its population health management strategy, Trinity Health selected hypertension management as a priority strategic aim for population health improvement in employed primary care, cardiology, and nephrology ambulatory practice sites. In 2019, Trinity Health identified an opportunity to improve ambulatory hypertension management outcomes for nearly 500,000 patients served across employed primary care practice settings. Even this large population of hypertensive patients cared for by Trinity Health's primary care providers represents only a fraction of the estimated 116 million patients with uncontrolled hypertension in the U.S. (CDC Facts About Hypertension, 2022). Hypertension is the leading modifiable risk factor in the prevention of heart attack and stroke (Block & Basile, 2021) and the CDC estimates that hypertension contributes $130 billion to the U.S. healthcare cost each year (CDC Fact About Hypertension, 2022). This area of focus remains relevant as the COVID-19 pandemic has transitioned to endemic. In 2021, while an estimated 415,000 deaths were attributed to COVID-19 as the primary cause, in that same timeframe an estimated 693,000 deaths were attributed to heart disease as the primary cause (Bloch & Basile, 2021).

The identification of an opportunity for Trinity Health to improve hypertension management and contribute to improved overall U.S. population hypertension outcomes resulted in the creation of a joint venture agreement between the American Medical Association (AMA) and Trinity Health to collaboratively implement the AMA and American Heart Association (AHA) MAP BP program for hypertension improvement in all Trinity Health-employed primary care practice settings. MAP BP is an evidence-based, clinically studied hypertension improvement program. MAP BP is an acronym for program interventions: **M**easure accurately to reduce provider uncertainty about the blood pressure value; **A**ct rapidly to rapidly bring the blood pressure to goal and reduce provider inertia to hypertension treatment, and **P**artner with patients to promote effective self-management of hypertension. This program aims to achieve well-managed blood pressure rates of less than 140mmHg systolic and less than 90mmHg diastolic for 80% of the population currently diagnosed with hypertension. A study by Boonyasai (2017) demonstrated that using the MAP BP framework may help primary care practices increase hypertension control rates and improve overall patient care. The national hypertension well-managed control rate is currently 45% (CDC Facts About Hypertension, 2022). At the onset of the joint venture in 2019, the Trinity Health hypertension control rate was 62%. The rate of hypertension control across all Trinity Health ambulatory care settings was 71% through January of 2023 when the pilot implementation began and 72% through June 2023 when pilot evaluation concluded. The targeted outreach pilot sites have lower than organization-wide rates of hypertension control with Boise performing at 64% pre-outreach intervention and 65% post-outreach intervention. SEMI rates of hypertension control were 67.6% pre-intervention and 67.9% post-intervention.

Achieving the organizational internal 80% well-managed hypertension goal requires Trinity Health practices to engage patients in the management of their blood pressure. This includes outreach to patients with uncontrolled blood pressure defined as 140mmHg systolic or greater, or 90mmHg diastolic or greater, or no blood pressure recorded within the last six

months. The purpose of outreach is to engage these patients in routine monthly virtual or in-office appointments for accurate blood pressure measurement, application of evidence-based medication therapy until blood pressure control is achieved and coaching on self-management with ongoing monitoring at a minimum of six-month intervals.

Application of the MAP BP program for hypertension management lends itself well to a focused improvement effort that includes the implementation and evaluation of automated patient outreach to engage patients in scheduling and attending hypertension follow-up office visits. The learnings from this program development and evaluation could be applied to automated outreach for other targeted populations for a variety of ambulatory clinical preventive health and chronic condition topics. Additionally, learnings could assist in the identification of the most effective modes of communication, messages, and best use of non-clinical resources and ambulatory nursing resources to support patient engagement, recommended care completion, and self-management.

Problem Statement

Before the COVID-19 pandemic, evidence supported by the AHRQ demonstrated that most American patients deferred a portion of recommended preventive ambulatory care (Borsky, 2018). The COVID-19 pandemic exacerbated the phenomena of deferred care with 40% of individuals delaying or deferring recommended preventive, chronic condition, or acute care (Czeisler et al., 2020). Now, in the endemic state, healthcare systems continue to experience financial and resource constraints that influence access to care and standard care delivery. This impact is being felt worldwide in primary care settings as 47 countries have reported a decreased ability to manage chronic illnesses such as hypertension and diabetes post the COVID-19 pandemic (Mughal et al., 2021). In addition to the individual patient actions to delay or defer care, healthcare systems experienced a reduced ability to provide ready

access to many preventive health, screening, and chronic condition services due to the strain of the pandemic response.

Trinity Health currently has variable, and often limited, ambulatory staffing resources to conduct prioritized patient outreach to engage patients in scheduling and attending appointments for recommended services including ambulatory preventive and chronic condition care. Additionally, Trinity Health does not have a prioritized population health outreach strategy that is deployed in a standard fashion across its ambulatory footprint making it difficult to ensure all patients receive outreach that promotes the completion of recommended care. It is not feasible for a national health system to pilot an ambulatory outreach strategy for all known gaps in care due to the sheer volume of the population requiring an outreach intervention. Trinity Health has identified ambulatory hypertension management as a key strategic priority for organizational quality improvement in support of overall population health improvement. Effective implementation of the evidence-based MAP BP program requires the frequent engagement of patients with a diagnosis of hypertension to achieve rapid management of their blood pressure goal. Without the application of dedicated resources, Trinity Health ambulatory practices will be unable to routinely conduct patient outreach and achieve the desired hypertension management goal. An opportunity exists to develop, implement, and evaluate a targeted hypertension patient outreach strategy to inform a larger nationwide outreach strategy across populations.

Clinical Questions

The main clinical question of interest is: Do patients with a current diagnosis of hypertension (population) who receive non-clinical outreach interventions such as text, email or EHR portal messages (intervention) demonstrate improved engagement in hypertension management as evidenced by completion of recommended care (outcome) as compared to patients who receive routine outreach intervention inclusive of bulk messaging and ambulatory

nurse-led outreach (comparison)? The evaluation of this outreach pilot will assist Trinity Health to understand the effectiveness of modes of patient outreach provided by health system nursing staff compared to vendor-assisted automated outreach. The results of the pilot evaluation may also inform the best use of ambulatory care team resources to support the completion of recommended care. Additional analysis could include patient and care team satisfaction with outreach intervention; improvement in hypertension management to goal for patients by outreach intervention; and barriers or influencers of deferred care for individuals who decline to schedule or complete an appointment post outreach.

Literature Review

Search methods for this literature review included a comprehensive search of two professional databases: the Cumulative Index to Nursing and Allied Health Literature (CINHAL) database and PubMed, as well as a publicly used database for scholarly articles, Google Scholar. The search terms used for all three databases included ambulatory care, primary care, or outpatient care as the setting. The terms used to describe the phenomena of interest included deferred care, gaps in care, care gaps, quality gaps, recommended care, quality measures, chronic condition, chronic illness, hypertension, and quality. The terms used to identify the intervention included nurs*, patient outreach, patient engagement, care coordination, care management, health promotion, adherence, self-management, self-efficacy, and patient-centered. Inclusion criteria were limited to a year range of 2018-2022 or within the last five years as a search filter, adults aged 18 years and older or all adult populations; populations with a chronic condition such as hypertension; full-text publications; and publications written in English. Exclusion criteria included pediatric and adolescent populations as well as populations without chronic disease. Of the 236 articles identified in the search, nine articles were selected for inclusion in the literature review based on meeting inclusion and exclusion criteria and their relevance to the study's clinical question. Of note, one article found in a broader search was published in 2010 and republished in 2016, although outside of the five-year search criteria, the

article was relevant to the phenomena of interest and clinical question and therefore was included. The study types in the literature review include two systematic literature reviews; a cluster randomized evaluation, two program evaluations, implementation of a process improvement, a retrospective qualitative data review, a qualitative interview, and a qualitative descriptive design.

The literature review demonstrated a lack of published studies addressing the phenomena of deferred recommended preventive health and chronic condition care in the ambulatory care setting. Most studies reviewed focused on clinical treatment recommendations for specific conditions in outpatient clinical settings and were not specific to the primary care setting. Many studies did not address the impact of patient outreach and engagement on deferred care or recommended care. The nine studies selected for inclusion highlighted patient outreach and engagement within the primary care setting to improve access, scheduling, and care outcomes. Consistent themes noted in these publications included the need to address ease of access and socio-economic barriers to care through patient outreach and engagement, enhance communication and relationship building, and deploy population health interventions to facilitate care scheduling, completion of care, and improved quality outcomes. The literature review demonstrates a successful patient outreach and engagement intervention will need to address each of these themes.

Access

Four of the nine studies selected: Brangan et al. (2018), Budde et al. (2021), Okeke et al. (2021), and Valaitis et al. (2020) specifically addressed access to care as a foundational component to ensure patient engagement in the completion of recommended care, assuming access to care is foundational to outreach and engagement interventions. The studies by Valaitis et al. (2020) and Okeke, et al. (2021) focused on efforts to improve patient engagement by increasing access to care through focused scheduling support for recommended services

resulting in improved completion rates of preventative and chronic condition care when patient access preferences were met. This enhanced access and scheduling support included same-day and after-hours care that may be delivered in the office, via virtual visits, or group visits. A study by Brangan et al. (2018) conducted in the United Kingdom noted that patient outreach calls increased understanding of the importance of recommended care and therefore resulted in 50% more appointments being scheduled when outreach was conducted via telephone versus via letter. The study also identified improved patient satisfaction with increased access to care, specifically the ease of appointment scheduling during telephonic outreach due to staff support. The study by Budde et al. (2021) noted the importance of patient navigators to ensure targeted population outreach was conducted for vulnerable patients with chronic conditions, including individuals underutilizing recommended healthcare services. The patient navigators offered expanded appointment access options to meet the care needs of the identified vulnerable population.

Socio-Economic Barriers

The ability to recognize and address socioeconomic barriers to accessing and receiving care was noted as a core theme across six of the selected studies (Brangan, et al., 2018; Budde, et al., 2021; Liddy, et al., 2011; Okeke, et al., 2021; Valaitis, et al., 2020; and Young, 2022). Brangan et al. (2018) noted patients needed to understand why it is important to complete recommended care, while outreach staff needed to be matched to the patient's cultural needs to help patients feel comfortable in sharing barriers to making appointments and accessing care. Young (2022) noted an understanding of patient food security, ability to afford medications and recommended care, behavioral health needs, and the overall needs of socially

disadvantaged patients are important aspects of patient engagement, reduction in barriers to care completion, and achievement of improved patient outcomes.

Patient Outreach and Engagement

All studies included components of patient outreach and engagement to enhance access, increase scheduled care services, promote improved rates of care completion, and improve care outcomes. Two of the studies highlighted specific outreach protocols including the mode of outreach, type of outreach, and automated versus in-person outreach. Okeke et al. (2021) found complex and vulnerable patients as well as patients who required transitions of care, behavioral health, and high-risk medication management benefited from in-person outreach conducted by care managers. Raebel et al. (2020) found that patients on high-risk medications had improved care experiences and a reduction in overdue care with automated phone call reminders and the availability of a non-clinical call line for questions.

Communication and Relationship Building

Effective communication skills and relationship building were core themes in three of the studies selected including Branagan et al. (2018), Cromwell et al. (2021), and Valaitis et al. (2020). One study noted that patients were more likely to schedule appointments if they understood the importance of the recommended care and had a trusting relationship with the care team member reaching out to them to schedule the service (Valaitis et al.,2020). Each study noted enablers of care completion included shared goals between the patient and care team as well as trusting and respectful relationships. Specifically, care team members who were passionate about care improvement had more success in patient engagement and scheduling. Brangan, et al. (2018) found cultural competence of outreach staff was vital to patient engagement and scheduling of care completion. This included understanding patient language preference and speaking to the patient in their preferred language, being part of the patient's medical team, and having access to the medical record. A study by Cromwell et al. (2021) also

noted the importance of patient relationships in communication and engagement. The study found that one-way communication, like a letter, is no better than no communication, finding that patients benefit from two-way communication resulting in improved engagement and improved access to care.

Population Health Interventions

Each of the studies selected identified various population health interventions to support patient outreach, engagement, scheduling, and completion of care. Interventions such as offering care management and care coordination resources via patient outreach demonstrated enhanced access and care completion. Care management interventions inclusive of patient coaching for self-management demonstrated increased engagement of complex and vulnerable populations (Liddy et al., 2020 and Okeke et al., 2021). Studies by both Young et al. (2022) and Budde et al. (2021) found the transition of care and navigation services between facilities and providers improved service completion. Of interest, the study by Willis et al. (2020) focused efforts on engaging the care team in the importance of evidence-based practice to manage chronic conditions demonstrating value in outreach efforts for both the patient and care team. These studies demonstrate the likelihood that population health management efforts require the engagement of both care teams and patients to improve patient activation and completion of care.

Rationale for Improvement

Trinity Health noted an ongoing lack of ambulatory staffing resources exacerbated by the COVID-19 pandemic and subsequent endemic state as a contributing factor to a decrease in proactive patient outreach and scheduling of recommended care across our national footprint of ambulatory practices. Trinity Health also noted a significant decrease in healthcare utilization across its national footprint, including ambulatory primary care settings. Trinity Health does not have a current national system-wide solution for automated patient outreach, nor does it have

organization-wide standard work in place to encourage ambulatory preventive visits, immunizations, screening services, chronic condition visits, and gaps in care closure. Given the opportunity for improvement in hypertension management, as well as other ambulatory recommended care measures, and the gap in operational support and standard processes for patient outreach, an organizational decision was made to launch an automated patient outreach pilot utilizing text. The intended purpose of the pilot is to compare the effectiveness of current patient outreach using routine EHR bulk outreach messaging supplemented by an established Trinity Health internal nurse call center located in Southeast Michigan to the patient text message outreach format delivered by a current contracted vendor outreach resource Stericycle/InQuicker (doing business as CareNet), deployed in Boise, Idaho. The comparison evaluation of this outreach will inform the organizational patient outreach strategy which may include the adoption of vendor-supported text outreach in addition to current outreach functionality or a decision to launch a national request for proposal for additional patient outreach solutions.

Organizational Assessment

The organizational assessment begins by clarifying the purpose of the organization as this sets the foundation for clinical care delivery and business operations within the clinical microsystem. The purpose should clearly articulate why the organization exists, who the key stakeholders are, and engage patients and professionals in the overall mission. At the healthcare macrosystem level, the mission of Trinity Health is to serve in the spirit of the gospel as a transforming and healthy presence within the community (Trinity Health Mission Statement, 2002). This mission is upheld by the core values of reverence, justice, commitment to those who are poor, stewardship, integrity, and safety. The delivery of the mission is supported by the Trinity Health brand promise to listen, partner, and make it easy. Each of Trinity Health's ambulatory care sites also has a mission that aligns with the macrosystem mission through care delivery within the clinical microsystem.

Key Stakeholders

The key stakeholders for this comparison pilot included both the Trinity Health system office (corporate headquarters) and state regional leadership teams in Idaho and Michigan representing Trinity Health Medical Group, Population Health Clinical Operations, Clinically Integrated Networks, Marketing and Communications, Health Informatics, Information Technology, Data Analytics, Legal and Integrity/Compliance. Key stakeholders at the local pilot location primary care office sites included providers and care team members representing ambulatory nursing and administrative support. Patient representatives were not included in the outreach pilot design due to a leadership decision that the comparison pilot is structured to evaluate if there is a benefit to adding vendor-supported automated text outreach functionality to current outreach efforts and patient feedback could be gathered at a later time after the organizational determination to adopt this functionality. The lack of patient inclusion in the outreach design is a key evaluation finding discussed later in this paper.

While there was overall enthusiasm and engagement from the system office and regional leadership teams regarding the importance and value of this comparative pilot, there were anticipated barriers including the unique operating differences and perspectives between health system regional teams and a cultural disconnect between corporate and local leaders regarding the span of control and decision making in the design and implementation of the outreach pilot and the need for standard data to evaluate the pilot. At the regional level, success required communication between leadership and practice teams to ensure coordination of outreach efforts, improved patient access, and consistent delivery of the MAP BP intervention for patients who scheduled and attended a hypertension follow-up appointment to achieve the desired pilot outcomes.

SWOT Analysis

A strengths, weaknesses, opportunities, and threats (SWOT) analysis informed understanding of the current state of patient outreach efforts across the Trinity Health ambulatory footprint. The strengths and weaknesses of deploying a national enterprise-wide patient outreach solution were noted as both an opportunity to recognize efficiencies and a threat due to the complexity of technical and operational standardization for the size and scale of the organization as well as cost constraints of expansion beyond the pilot across the organizational national footprint. Although these threats were noted, there was agreement that the largest threat identified is doing nothing to address the ongoing rate of deferred care. Automated patient outreach to facilitate appointment scheduling for the completion of recommended care supports several growth and quality improvement strategies including hypertension management. A system-wide solution for automated patient appointment reminders and proactive outreach that promotes patient engagement in care and provides ease of appointment scheduling will assist in gaps in care closure and contribute to improved volumes of ambulatory care visits without solely relying on additional staffing resources to conduct the outreach.

The SWOT analysis clearly outlined the gap in leadership and key constituent alignment on a single vendor solution as initially six vendors outside of the Trinity Health Epic EHR instance were identified for vetting. The considerable time and resource investment required in a national request for proposal process and the cost of purchasing and deploying a single national vendor solution were noted. As a result, executive leadership requested a comparison pilot be conducted in the second quarter of the fiscal year 2023 (October 1, 2022, through December 31, 2022) to evaluate if an effective outreach solution could be deployed utilizing current internal EHR and nurse call line resources in Southeast Michigan compared to the current contracted patient communication and scheduling vendor solution deployed in Boise Idaho. The SWOT analysis confirmed key system office executive and regional leadership engagement in understanding the effectiveness of in-house versus vendor-supported outreach,

barriers to outreach, and clinical and non-clinical resources required to improve the completion of recommended care and improvement of hypertension outcomes. Due to a lack of executive leadership alignment between key stakeholder groups on the text outreach pilot design, the comparison pilot took place in the third quarter of the fiscal year 2023 (January 1, 2023, through March 31, 2023). The subsequent comparison evaluation took place from March through June 2023.

Purpose Statement

This project was a program development and evaluation designed to determine the effectiveness of an outreach pilot in Trinity Health ambulatory care primary care practices inclusive of vendor-supported automated text outreach in the Trinity Health Boise market compared to internally-supported EHR bulk messaging supplemented by an ambulatory nurse call line in the Trinity Health Southeast Michigan market for a population of patients with a current diagnosis of hypertension who have deferred care or who are currently not at well-managed blood pressure goals. If successful, the pilot would inform strategies that improve patient engagement in scheduling and receiving recommended care and reduce the burden on ambulatory office staff in conducting phone calls for all patients who do not routinely seek care. The effective use of automated outreach would allow nursing to focus live outreach efforts on patients who do not engage in scheduling and attending appointments to provide additional self-management and coordination of care support.

The planned outreach pilot evaluation included vendor-supported automated outreach functionality inclusive of text, email, non-clinical scheduling support, and 24/7 nurse telephonic support as compared to internally coordinated EHR portal messaging and ambulatory nurse call center outreach to determine the effectiveness and feasibility of each solution before deciding on a national system standard for ambulatory outreach. The purpose of this program evaluation was to determine the effectiveness of each intervention in engaging patients to schedule and

attend an appointment for recommended hypertension care. The evaluation could also inform the use of ambulatory nursing self-management and care coordination support to understand which interventions improve the completion of deferred care and contribute to improved preventive health and chronic illness outcomes. The learnings from this pilot may inform strategies to address deferred care and promote the completion of recommended care.

Theoretical & Conceptual Framework

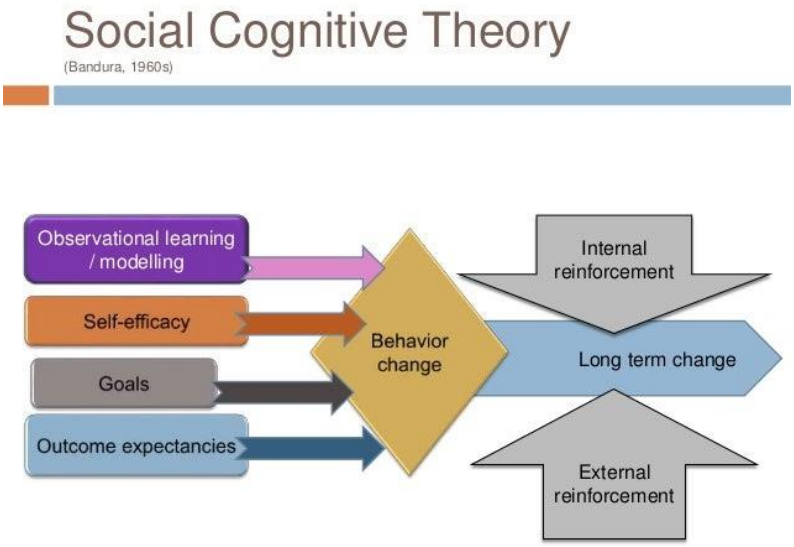
Engaging patients in effective preventive health self-management "relies on people understanding screening, being able to access services, and clear messaging from healthcare professionals" (Newland et al., 2021, para 16). When breaking down these concepts, theoretical and conceptual frameworks underpinning an outreach strategy must address patient engagement and self-management support as well as the health system structure to ensure access to care, completion of care, and offer coordination of care. Bandura's Social Cognitive Theory and the Patient-Centered Medical Home framework were selected to guide the development and implementation of the pilot. The CDC program evaluation framework was selected to guide the evaluation of the pilot to inform recommendations.

Patient Engagement and Self-Management Support

The complexity of managing chronic conditions requires engaging the patient in healthy behaviors through education and self-management support. Bandura's Social Cognitive Theory developed in 1977 observes that individual behavior is influenced by learning through observing the behavior of others (Butts & Rich, 2018). Social Cognitive Theory explains the influencers of behaviors and informs behavioral interventions. It is used to increase self-efficacy through self-monitoring and improved adherence to recommended treatment. The nursing application of Social Cognitive Theory includes role modeling behaviors, providing positive reinforcement, and creating situations in which the learner may perform the behavior. In application to health

promotion, the use of Social Cognitive Theory encourages self-efficacy in care to maintain health and manage chronic illness.

FIGURE 1. BANDURA'S SOCIAL COGNITIVE THEORY

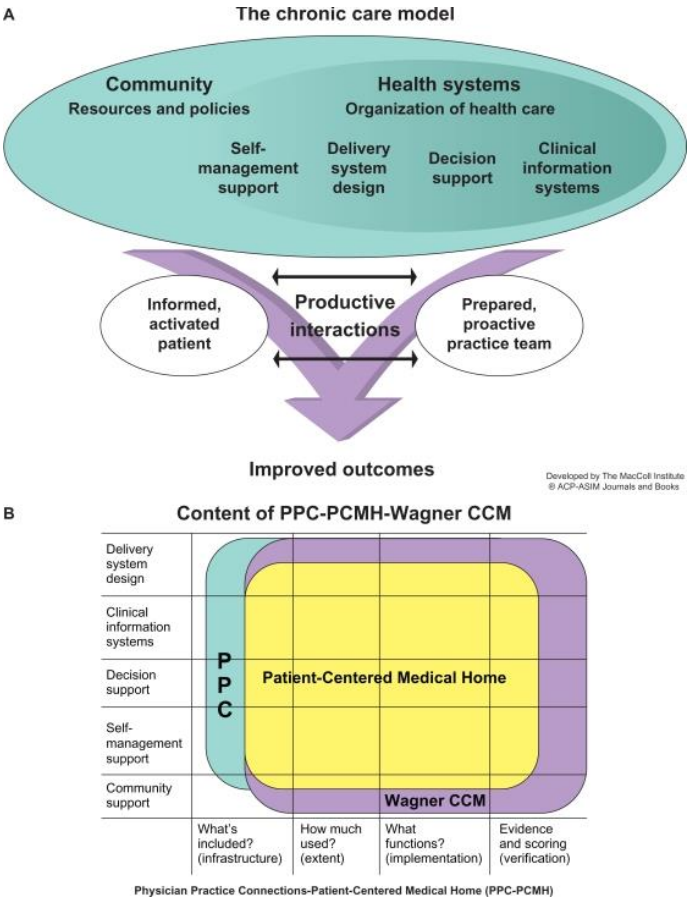


Healthcare Organizational Structure

The Institute of Medicine (2001) notes that complexity in the practice setting is a leading variable in the "significant unpredictability and variation in clinical outcomes" (Butts & Rich, 2018). To be successful, healthcare systems must be flexible and adaptive to deliver high quality safe, reliable, and well-coordinated care (Lartey, R.M., 2020). The application of Complexity Theory assists with the creation of order in complex systems. Complexity Theory is derived from Chaos Theory which represents "unpredictability in an evolutionary system of order" (Lartey, R.M., 2020, para 1). Understanding Complexity and Chaos theory is necessary to understand how small organizational structure or operations changes can result in unexpected outcomes. An example of a complex healthcare problem relevant to deferred care is the need to coordinate patient care across a large multi-provider system with multiple facilities, technology systems, and staff members. The Chronic Care Model best illustrates the

care of a patient with one or more chronic illnesses in the context of a complex system (Wagner, 1998).

FIGURE 2A. WAGNER CHRONIC CARE MODEL AND 2B. PHYSICIAN PRACTICE CONNECTIONS PATIENT-CENTERED MEDICAL HOME



Framework for Evaluation

To support program evaluation, the Centers for Disease Control and Prevention (CDC) Program Performance and Evaluation Office created a framework for program evaluation in public health which includes six steps using four standards to promote the systematic evaluation of program improvement initiatives. This patient outreach evaluation utilized the CDC program evaluation framework to organize and drive the assessment of the comparison interventions and sharing of resulting recommendations.

FIGURE 3. CDC EVALUATION FRAMEWORK

Centers for Disease Control and Prevention. Framework for program evaluation in public health. MMWR 1999;48 (No. RR-11)

Methods

The pilots ran from January through February 2023 in the Boise, Idaho region and February through March 2023 in the Southeast, Michigan region respectively with the evaluation beginning in April 2023 and concluding in June 2023.

Scope and Overview

Pilots were structured to provide patient outreach from the most automated to the least automated allowing staff to focus on patients who require assistance with appointment scheduling, self-management support, or care coordination due to medical complexity or social influencers of health barriers. Both pilots targeted 250 adult patients with a current diagnosis of hypertension and a most recent blood pressure value exceeding the goal of less than 140/90 mmHg or no documented blood pressure in the last six months or greater. Both pilots were structured to utilize the same patient inclusion criteria, scripting, and outreach cadence timing.

The external vendor-supported outreach pilot in Boise, Idaho was structured to include vendor-delivered Short Message System (SMS) text outreach with direct appointment

scheduling functionality. This represents enhanced functionality that does not exist in the current Trinity Health TogetherCare EHR instance. The remainder of the external outreach pilot was designed to mirror the internal outreach pilot process occurring in Southeast Michigan. It is important to note the vendor solution for non-clinical and clinical phone calls is available via a 24/7 call center which provides increased flexibility to call patients in the evenings and on weekends when patients who work outside of the home may have more availability to answer the call.

The internal outreach pilot in Southeast Michigan (SEMI) was structured to include the use of Trinity Health EHR patient portal messages to notify the patient that their provider would like to schedule a follow-up appointment based on their last office visit blood pressure result. The portal messages include a link to dates and times available for a hypertension visit within 30 days of the date of outreach. If the patient did not respond within five business days of the portal message by scheduling an appointment, the primary care office staff were to make a non-clinical phone call to attempt to schedule the patient for an appointment. If the non-clinical outreach were unsuccessful or did not result in the patient agreeing to an appointment, a clinical phone would occur within five business days to encourage the patient to schedule an appointment. The SEMI pilot did not launch the planned non-clinical phone call component of the pilot. A clinical phone call intervention was conducted by an ambulatory clinic nurse or ambulatory care manager trained in patient self-management and chronic condition support for patient engagement, education, disease management, coordination of care, and barrier removal.

Evaluation Measures

The defined lagging outcome measure to evaluate outreach pilot success was the achievement of blood pressure control defined as <140mmHg systolic and <90mmHg diastolic

for the population receiving any combination of outreach engagement, scheduling, and self-management support interventions. Several leading metrics were defined to assess the effectiveness of the outreach mode utilized on patient engagement and appointment attendance:

- outreach completion by mode (text, email/portal, non-clinical phone call, clinical phone call)
- outreach engagement rate is defined as the patient agreeing to outreach communication by mode.
- outreach conversion rate defined as appointments scheduled.
- appointments attended.
- follow-up appointments scheduled.
- follow-up appointments attended.
- last blood pressure and date at pilot launch and for each subsequent visit

The financial program evaluation included an expense analysis of the cost of the vendor-supported solution as compared to the cost of analytic and clinic staff resources used for an internal solution. The revenue analysis included the volume and dollar amount of completed billable visits. The vendor expense was covered by the billable revenue based on financial projections. There remains concern that the current internal call line resource in use in SEMI may not be financially viable or operationally scalable across other Trinity Health regional markets due to labor expenses and resource availability. SEMI did not provide a financial analysis of the cost of nursing call line intervention.

A decision was made by leadership not to build formal patient experience or care team experience surveys into this initial comparison pilot. There is an opportunity to assess patient experience for individuals who receive vendor telephonic outreach if the individual selects to participate in a brief 2-question satisfaction survey regarding the ease of scheduling the

appointment and the value of the outreach phone call. There is no opportunity to edit or add questions to this standard vendor survey. There is no patient experience survey built into other outreach modes or the internal outreach pilot. Each pilot site agreed to solicit informal feedback from practice administrators on overall pilot value and suggestions for improvement.

A decision was made by leadership not to include social influencers of health data as barriers to patient engagement can be collected in both the internal and external pilot groups by the nurses conducting outreach phone calls. Unfortunately, neither the vendor nor the internal nurse call line collected this data during the pilot. There was vendor hesitancy to add patient social influencers of health (SIOH) survey data to the pilot as all identified needs would require referral back to the health system care management team to address. The SEMI team determined collection of SIOH data would require manual chart abstraction as the data sources are included in the internal nurse call center and EHR case management notes and there were not sufficient resources available to perform this abstraction.

Evaluation data sources included the Trinity Health TogetherCare Epic EHR to identify targeted outreach populations, generate a list of patients for each progressive mode of outreach, identify the next visit date and most recent blood pressure value, and identify billed and reimbursed office visits occurring during and post the pilot intervention. The quality leaders at each of the pilot sites were responsible to work with the vendor and care team members to track the mode and date of patient outreach intervention.

Ethical Considerations

Patient reminder/recall, scheduling support, and chronic condition management services are considered part of routine care in ambulatory practice and are core to the concepts of a patient-centered medical home and the chronic care model. The innovation piloted is the full

automation of patient outreach services by an external vendor as compared to usual care supported by EHR patient messaging and office staff outreach. Trinity Health deemed this outreach intervention to be a process improvement activity as part of routine care and determined the pilot did not meet the internal organization threshold for IRB review. It is important to note that Trinity Health ambulatory legal counsel including experts in privacy, integrity, and communications were included in the intervention design specific to outreach methodology and messaging. As part of this evaluation, all patient data were de-identified to ensure privacy and regulatory requirements were met. Additional safeguards to privacy included designating one individual, the regional medical group ambulatory quality leader, to identify patients for inclusion in the pilot based on established criteria. This individual was responsible for generating and distributing this patient demographic file to either the vendor for outreach in the Boise pilot or the internal outreach team in the Southeast Michigan pilot per established protocol. This patient demographic file was housed electronically in a secure Trinity Health server at the regional medical group level ensuring the data was not available for access to the larger pilot team who does not have access to the regional server. The transfer of this file to the external vendor was conducted via a secure file transfer protocol (SFTP) site established by Trinity Health information technology and adhered to data security standards consistent with the Trinity Health established contractual use of the data which includes privacy and acceptable use standards. For the internal arm of this pilot, the targeted patient outreach list was provided to the office staff who routinely conduct outreach for the targeted patient population. These staff currently have access to this data as part of their routine role within the practice and are subject to all privacy and data protection regulations that are part of their Trinity Health employment. The detailed patient outreach report was returned to the regional ambulatory quality leader to abstract EHR data to determine if patients who scheduled appointments post-intervention attended the appointment and gather blood pressure values for these appointment instances. The designated regional quality leader then provided a de-identified report of established pilot

key performance indicators and outcomes to the system office director of ambulatory clinical operations for pilot evaluation.

This pilot evaluation also served as the Doctor Nursing Practice (DNP) project for the Trinity Health system office director of ambulatory clinical operations leading this pilot. A letter of support for the formal evaluation of this program was provided by the Trinity Health vice president of population health to the University of Detroit Mercy (UDM) Internal Review Board (IRB). This outreach pilot evaluation received approval from the UDM IRB per expedited review as the pilot proposal met the criteria for appropriate use and protection of patient data.

Evaluation Design

The goals of this comparison project evaluation were to determine if vendor-supported automated text outreach results in patients' scheduling and completing recommended care while decreasing reliance on ambulatory office staff resources to identify patients with gaps in care and conduct proactive patient care outreach. The design of the comparison pilot of 250 hypertension patients in each intervention allowed Trinity Health to evaluate the effectiveness of current organizational tools available to support population outreach. The evaluation pilot leveraged both the current available EHR bulk outreach functionality supplemented with the regional ambulatory nurse call center resource in Southeast Michigan, and an external vendor automated text outreach in Boise Idaho to assist the organization in understanding which outreach approaches are most effective to engage patients in receipt of recommended care. The pilot anticipated including visit encounter dates with last blood pressure result, office visit billing codes, primary language spoken, insurance coverage, documented barriers to completion of recommended care, patient satisfaction with the intervention, and care team satisfaction with the pilot which will be documented within the EHR as well as vendor call system reports in addition to standard patient demographic data such as age, gender, race, and ethnicity. There was great variation in the data that was abstracted and provided for evaluation due to several

factors including a lack of clarity on outcome metrics, resistance to the suggested pilot design, and a leadership decision to terminate the Boise vendor-supported pilot in March 2023. It is important to note the intended evaluation of the pilot was to examine several factors:

- Effectiveness of Modes of Communication: Which modes of communication: text, email, portal communication, non-clinical phone calls, and clinical phone calls are most effective to engage patients to schedule and attend an appointment? Is there a difference in the effectiveness of modes of communication for various population demographics including age and gender? What is the average time between text or call to the time the appointment is scheduled?
- Ambulatory Nursing Intervention: There is also an opportunity to understand which patients respond best to clinical outreach by an ambulatory nurse for self-management and care coordination support to assist in the effective application of staffing resources. This may include the presence of multiple chronic conditions, differences in insurance coverage, or other socio-economic barriers.
- Internal versus External Solution: This pilot compared patient engagement in scheduling and attending an appointment and the cost-effectiveness of internal outreach versus a vendor-assisted outreach intervention. Measures included successful patient engagement in scheduling an appointment and appointment attendance. Evaluation measures were also to include expense as compared to revenue generated, and hypertension outcome data to inform the clinical and business case for keeping outreach services in-house or contracting for vendor-supported automated outreach service to supplement current bulk outreach processes.
- Need for National Request for Proposal (RFP): If through the pilot evaluation, current in-house and vendor outreach tools were determined insufficient for patient engagement and achievement of hypertension management, approval would be sought for a national RFP to source an automated patient outreach solution that is inclusive of a 24/7 365

inbound and outbound call center capable of patient non-clinical scheduling support and clinical self-management, care coordination, and disease management support. This is the costliest intervention and therefore care was being taken to evaluate if this level of patient outreach support was justified.

Operational measures of success included successful outreach, scheduling, and attendance of virtual or in-office appointments. Financial measures of success included a return on investment based on revenue of completed office visits compared to the expense of patient outreach and engagement. Initial cost analysis by region demonstrated the average reimbursement for an ambulatory hypertension visit generated revenue greater than the cost of the automated outreach intervention. It was intended to gather additional internal staffing cost, and office visit revenue data to understand the cost of ambulatory nurse intervention as compared to the revenue of the hypertension office visit. This data was not collected in the SEMI pilot due to the decision to terminate the automated arm of the outreach pilot in March 2023. The pilot also intended to measure the impact of interventions on the achievement of hypertension management to a goal of <140mmHg systolic and <90mmHg diastolic within 6 months of patient outreach. This evaluation was not completed in either region due to the early termination of the pilot although blood pressure data was provided for the Boise population who scheduled and attended an office visit within 30 days of outreach intervention.

Evaluation of Project Implementation

The automated patient outreach comparison pilot received final Trinity Health Medical Group senior vice president approval in August 2022 as a post-pandemic health system emergence strategy focused on re-engaging patients in the receipt of recommended care and encouraging billable office visit growth. This approval was based on the identified gap in recommended care for established medical group patients with a current diagnosis of hypertension and blood pressure not at goal, and the financial analysis of projected office visit

revenue over pilot expense for targeted markets. The accountable employed medical group leaders for the selected regional market pilot sites, Boise and Southeast Michigan, agreed to pilot participation including allocation of staff time for pilot development, implementation, and evaluation as well as coverage of all pilot-related expenses based on the revenue estimations.

Boise Pilot Evaluation of Implementation

Initial pilot discussions were held between the system office digital health and marketing and communications teams with the Boise medical group operations team and the outreach vendor to design and launch the outreach effort for hypertension patients in August and September. These initial meetings did not include system office population health, informatics, and project management team members assigned to the pilot and therefore did not take into consideration design criteria for the application of outreach across the Trinity Health national footprint. This contributed to variation in the agreed-upon data fields to be collected for evaluation of the pilot. The system office executive accountable leader was informed of the siloed approach occurring in the Boise pilot and requested the engagement of the entire system office pilot team in outreach pilot design, implementation, and evaluation to assure organizational alignment. A kick-off meeting inclusive of all key constituents was held on September 21, 2022, with a stated goal of streamlining member communication to prompt patients with hypertension overdue for recommended care to schedule appropriate visits. Meetings inclusive of all key stakeholders were held weekly with the vendor and bi-weekly. Updates were provided to the Trinity Health executive leadership team via email and verbally during emergence team meetings. The evaluation concluded the level of Boise pilot stakeholder engagement and frequent meeting cadence contributed to the strength of the pilot design and implementation. Weaknesses included the lack of patient involvement in the design of the intervention and the lack of data collection to support evaluation specific to social influencers of health and patient experience.

The functional scope of the pilot included Short Messaging Service (SMS) text notification to prompt members to click on a self-service hypertension appointment scheduling link, followed by email notification within 3 days of initial outreach to prompt members to access the self-service scheduling link if they had not already scheduled an appointment, followed by live voice active outreach to members within 5 days of email outreach to provide scheduling assistance for patients who had not yet scheduled a hypertension appointment. The initial timeline for the pilot included kick-off and technological build in September and October 2022, deployment of the outreach intervention in October 2022, with evaluation from October through March 2023. A revised project plan and Gantt chart were developed for kick-off in September, pilot development in November 2022, technical build in December 2022, and pilot launch in January 2023. The timeline was delayed significantly due to a lack of alignment on the pilot structure and outreach scripting causing delays in legal, and integrity & compliance approval as well as the vendor technical build. In the evaluation of this delay, it was noted that the time projected for marketing and communications as well as the legal team to review and approve the proposed outreach language was significantly underestimated. A recommendation would be to include representatives from both marketing and communications as well as legal early in program design discussions, budgeting a minimum of a month for language approval between the health system and vendor. The language agreed upon by Trinity Health's key stakeholders and vendor partner was as follows:

- **SMS script:**

  > You have a message from Saint Alphonsus. All messages from Saint Alphonsus comply with medical privacy laws, but text messaging may not be entirely secure. To consent to receive text messages, reply YES.
  >
  > If a member replies 'YES': Your blood pressure requires further attention based on our most recent reading. To schedule an appointment, please click the following link:*: <InQuicker Scheduling URL>* or call 208-932-0548*.*

- **Email script:**

  > Email Subject: *It's Time to Schedule Your Next Appointment*

Email Message: *We care about your health. Our records suggest that your blood pressure needs further review within the next month at a primary care visit. Please schedule an appointment with your primary care provider to occur within the next month by visiting <InQuicker Scheduling URL> or calling <Live Voice Phone Number>.*

- **Inbound Script:**

Opening Script: *Thank you for calling Saint Alphonsus. My name is [Agent Name]. How may I help you?*
Closing Script: *Thank you for calling Saint Alphonsus.*

- **Outbound Script:**

For our outbound calls, the agent will call the members that haven't scheduled an appointment by day 8.

Opening Script: *Hello, this is [Agent Name]. I am calling on behalf of Saint Alphonsus. Our records suggest that your blood pressure needs further review within the next month at a primary care visit. Would you like to schedule an appointment now?*

Voicemail on 1st Attempt: *Hello, this is [Agent Name] calling on behalf of Saint Alphonsus. Our records suggest that your blood pressure needs further review within the next month at a primary care visit. For assistance scheduling your appointment, please call us at 208-932-0548. We are available 24 hours a day, 7 days a week to assist you.*

Second follow-up Call (last attempt, maximum 2 calls) - leave a final voicemail:

Hello, this is [Agent Name] calling on behalf of Saint Alphonsus leaving you a final voice message in an attempt to connect with you to schedule a primary care visit. Our records suggest that your blood pressure needs further review within the next month at a primary care visit. For assistance scheduling your appointment, please call us at 208-932-0548. We are available 24 hours a day, 7 days a week to assist you.

The final pilot outreach scripting and patient disposition did not include input or feedback from patients representing the targeted population. This is a weakness of the outreach program design as the language was not developed from the perspective of the patient to ensure an understanding of the purpose of the outreach and who was performing the outreach.

The initial text and email messages were sent to 250 patients over a 2-week period splitting the defined outreach population out into 125 phase one patients and 125 phase two patients to ensure appointment access and to not overwhelm office staff who may receive a post-outreach patient phone call with questions and scheduling support. Two patients scheduled an office appointment using the text link and no patients scheduled using the email link. Post the initial text outreach intervention, primary care provider offices reported patients calling to inquire if the text message they received was legitimate and why the message did not include the name of the provider and the name of the office the patient was being requested to schedule with. Patients did not identify with the name St. Alphonsus Health System. As a result of these calls, 29 additional patients were scheduled for appointments within 30 days with their PCP. Additionally, the vendor noted that more patients agreed to receive text messages from the health system when they were sent in the afternoon versus the morning. Recommendations for a repeat text message pilot include adding the provider and office name to the text message and sending the message after 2:00 pm. The vendor did note gaps in accurate phone numbers and email addresses and advised the health system to address this before future outreach interventions.

Vendor-initiated calls were planned for Monday through Friday from 9 AM to 6 PM Mountain Standard Time. The vendor advised the best practice was for calls to be made during physician office hours to allow for patients who needed follow-up discussions with the office to be transferred while the phone lines were open. The vendor-initiated call disposition was to be captured as either scheduled appointment, declined (general), declined (with reason) of already scheduled online, will schedule online, or will schedule with the office. Of the 248 Boise patients who received a vendor-initiated call, only one patient responded and scheduled an appointment during the vendor call. After evaluation, a recommendation includes an adjustment to the call timeframe to include evenings and weekends to accommodate individuals who may work during the Monday through Friday 9 AM to 6 PM timeframe.

FIGURE 4A. BOISE WAVE 1 HYPERTENSION PATIENT OUTREACH

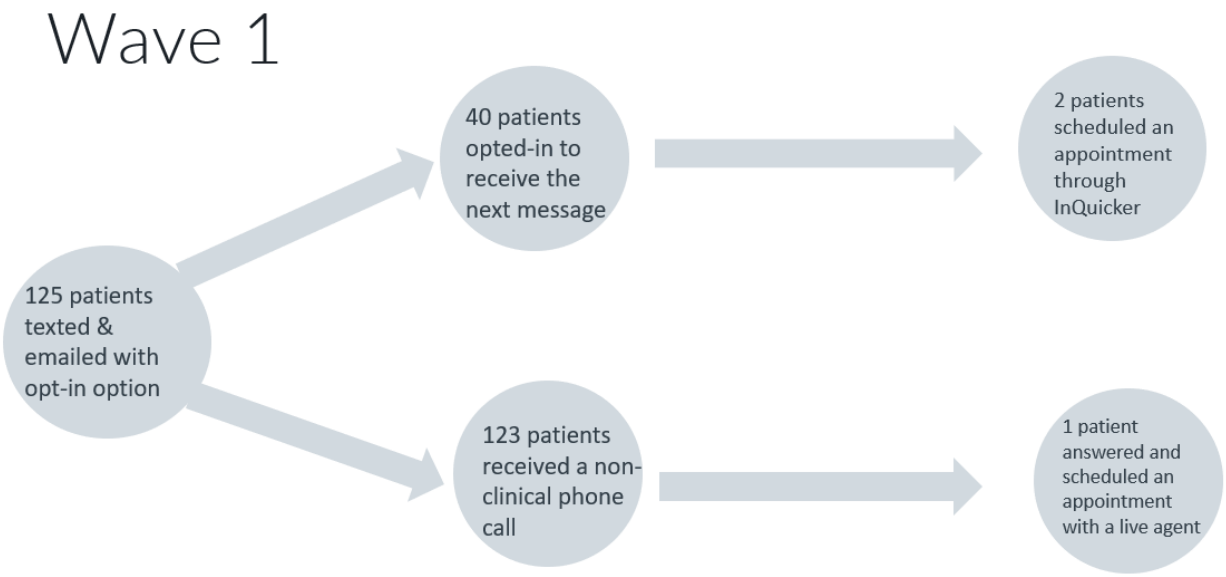
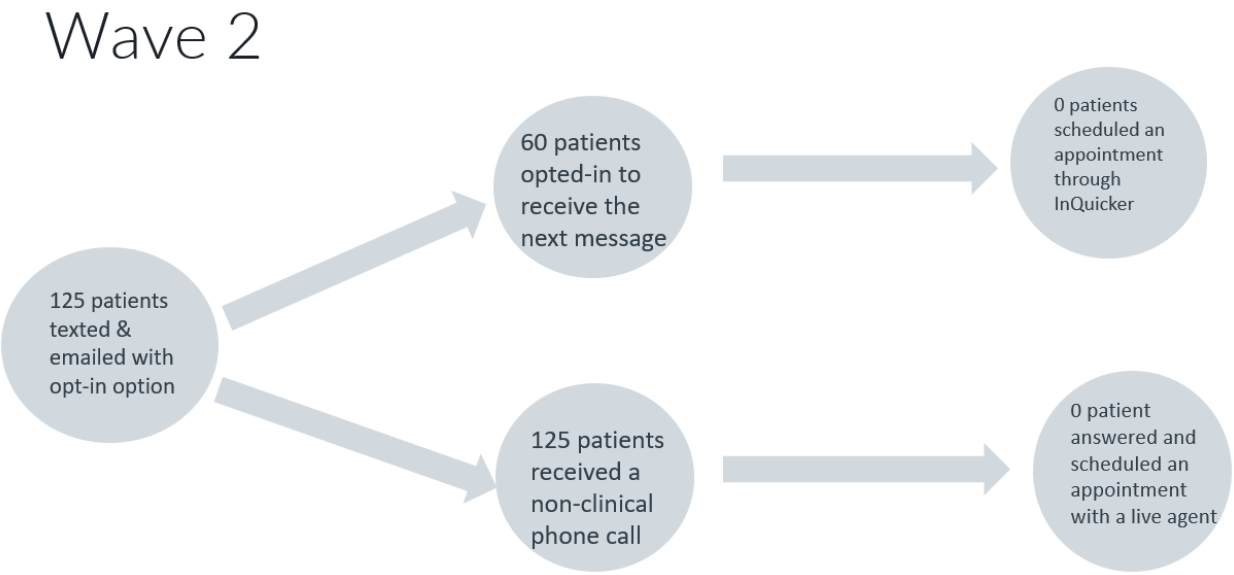


FIGURE 4B. BOISE WAVE 2 HYPERTENSION PATIENT OUTREACH



Boise Pilot Executive Summary

An executive summary of the initial Boise outreach pilot was provided to Trinity Health system office medical group and population health leadership including the following information:

- **Target Population:** Patients with a diagnosis of hypertension who had a PCP encounter with a Boise provider in the last year, are 18 years and older, and had no visit in the last 6 months or whose last blood pressure is either >140 systolic or >90 diastolic.
- Wave 1 of **text outreach** launched on 1/11/23 at 9:00 am mountain time to 125 patients.
    - 40 of 125 patients agreed to receipt of text messages for a positive response rate of 32%
    - 2 of 125 patients scheduled an appointment the same day as a result of text outreach for a conversion rate of 1%
    - 5 patients opted out of text.
    - 5 patients could not be reached via text due to inaccurate phone numbers.
    - 75 patients did not respond.
- Wave 2 of **text outreach** launched on 1/13/23 at 2:00 pm Mountain time to the remaining 125 patients.
    - 57 of 125 patients agreed to receipt of text messages for a positive response rate of 45%
    - 0 of 125 patients scheduled an appointment as a result of text outreach for a conversion rate of 0%
    - 5 patients opted out of text.
    - 5 patients could not be reached via text due to inaccurate phone numbers.
    - 58 patients did not respond.
- Wave 1 and 2 of **email outreach** launched on 1/19/23 at 2:00 pm Mountain time to patients who did not schedule an appointment.
    - Multiple members without email addresses in the TogetherCare system are identified as a barrier. **Note the exact number of emails sent was not captured or provided by the vendor.*

- **Outcome:** As of March 2023, 32 patients included in the pilot scheduled hypertension office visits post text, email, and phone outreach representing a 12.8% success rate
- Wave 1 and 2 non-clinical scheduling **phone calls** launched on 1/23/23 to all patients who did not schedule an appointment.
    - CareNet anticipated a 10% response rate based on a comparable population response rate to scheduling phone calls.
    - 1 patient answered phone calls from CareNet.
    - Clinical phone calls were not launched using CareNet.

Boise Key Stakeholder Evaluation Recommendations:

- Trinity Health needs to improve the capture of accurate patient cell phone and email addresses in the TogetherCare Epic EHR before the launch of any outreach effort.
- Begin outreach script development with marketing and legal early to finalize messaging promptly.
- Include the provider name, office name, and date of last appointment on the text and email messaging to increase patient brand recognition and trust to click on the scheduling link.
- Adjust the text and email verbiage to increase the necessity to book an appointment using stronger language in the second text i.e. “you are due for a follow-up appointment for your blood pressure.”
- Have patient representatives review and provide feedback on outreach messages.
- Send text messages and emails simultaneously to decrease outreach turnaround time.
- Send up to three text and email messages to patients who have not scheduled an appointment prior to initiating a phone call.

- Send text messages out in the afternoon and try outbound phone calls in the evening or on weekends.
- Clarify that success is defined as scheduling and attending an office appointment versus agreeing to receive a text message.
- Repeat the pilot with 250 additional hypertension patients in the Boise market incorporating in lessons learned to evaluate intervention success.

Change in Leadership Direction

As a result of this update, and after a demonstration of current TogetherCare bulk outreach functionality, executive leadership in population health determined the Boise outreach pilot was not successful despite the initial evaluation findings and recommendations to repeat the pilot. The determination was made that additional efforts to implement vendor-supported automated text outreach would cease. The rationale for this decision was based on several factors including the length of time spent on gaining consensus during pilot development causing significant delays in pilot implementation; the perceived lack of meaningful patient response to initial text messages, emails, and subsequent phone calls; and the desire to utilize functionality already purchased and embedded in the Trinity Health TogetherCare instance of the Epic EHR (bulk outreach) versus paying for additional vendor-supported text functionality. The leadership direction was to stop all future pilot development, implementation, and current data analysis efforts on the Boise pilot. The vendor subsequently stopped all meetings as there was no longer organizational approval to relaunch the pilot incorporating lessons learned. The vendor declined to provide additional data or participate in further data analysis. Additionally, the local regional and system office analytics team determined they did not have the resources to complete the data analysis as proposed as this was no longer a system office-supported emergence team effort.

Accountability for the proactive population outreach efforts was shifted away from the director of ambulatory clinical operations and moved under the direction of the vice president of population health. A new operations team was formed to develop and implement a Trinity Health standard outreach strategy utilizing TogetherCare bulk outreach as the exclusive technical solution supplemented by regional medical group practice staff outreach phone calls where resources were available. Members of the comparison pilot team were informed they would be contacted to participate in the development of the new system proactive population outreach strategy on an as-needed basis. The director of ambulatory clinical operations communicated this decision to both Boise pilot team leadership and Southeast Michigan pilot team leadership. Lessons learned from the change in leadership direction are to formally discuss evaluation recommendations before sending written reports; ensure executive leadership understands that initial pilot results will likely include opportunities for improvement and test of change; and ensure implementation delays are minimized and clearly communicated with updated timelines to avoid the perception of inaction or failure.

Southeast Michigan Evaluation of Implementation

The Southeast Michigan (SEMI) team determined they did not have sufficient resources to begin the hypertension patient outreach pilot until January of 2023 at the earliest to allow for the closure of patient outreach efforts supporting payer quality program activities. The SEMI leadership team initially requested to pilot the Boise vendor text solution in addition to their current standard patient outreach interventions but were asked to consider being the routine care comparison due to their established use of TogetherCare bulk outreach and internal centralized nurse call line capability serving all Trinity Health practices in Southeast Michigan. They agreed to participate in the outreach pilot with the caveat that if vendor-assisted outreach were found to be successful in Boise, SEMI would be the next regional health ministry approved to use this functionality. This was agreed upon by the system office director of ambulatory clinical operations and supported by the accountable executive of the medical group.

In March 2023, the SEMI team was informed of the leadership decision at system office to stop work on the Boise pilot and not to offer the vendor-assisted text functionality for outreach as a Trinity Health solution, instead focusing on the use of TogetherCare bulk outreach. The SEMI team expressed their disappointment and asked for time to evaluate if it made sense to utilize resources to run the comparison pilot as planned if they had no future opportunity to utilize vendor-supported automated text outreach. Ultimately, the SEMI team agreed to launch the hypertension outreach comparison pilot but determined they would not gather all initially requested data fields due to resource constraints and concern that the results of the effort would not be utilized to inform future outreach methods as an executive decision was made regarding the use of TogetherCare bulk outreach as the sole outreach functionality. SEMI leadership communicated that their determination to run the pilot was to ensure the DNP project would have comparison data.

A project plan and Gantt chart were developed to support scheduled hypertension outreach to 250 patients. The outreach was designed to use the same patient identification criteria and outreach scripting utilized in Boise with the addition of the primary care provider and office practice name within the outreach messages. The SEMI team did not include patient race, ethnicity, primary language, and insurance coverage as captured data fields on their demographic file, they did not provide financial costs associated with current outreach efforts, and blood pressure values associated with completed visits. The SEMI team did not allocate resources for statistical outreach evaluation but did provide some descriptive outreach evaluation in addition to the de-identified. The team also determined that the outreach effort would begin with an initial email inclusive of an EHR scheduling link, followed by a MyChart EHR portal message (bulk message), followed by a nurse call line phone call.

Southeast Michigan (SEMI) Pilot Executive Summary

An executive summary of the SEMI outreach pilot was provided to Trinity Health system office medical group and population health leadership including the following information:

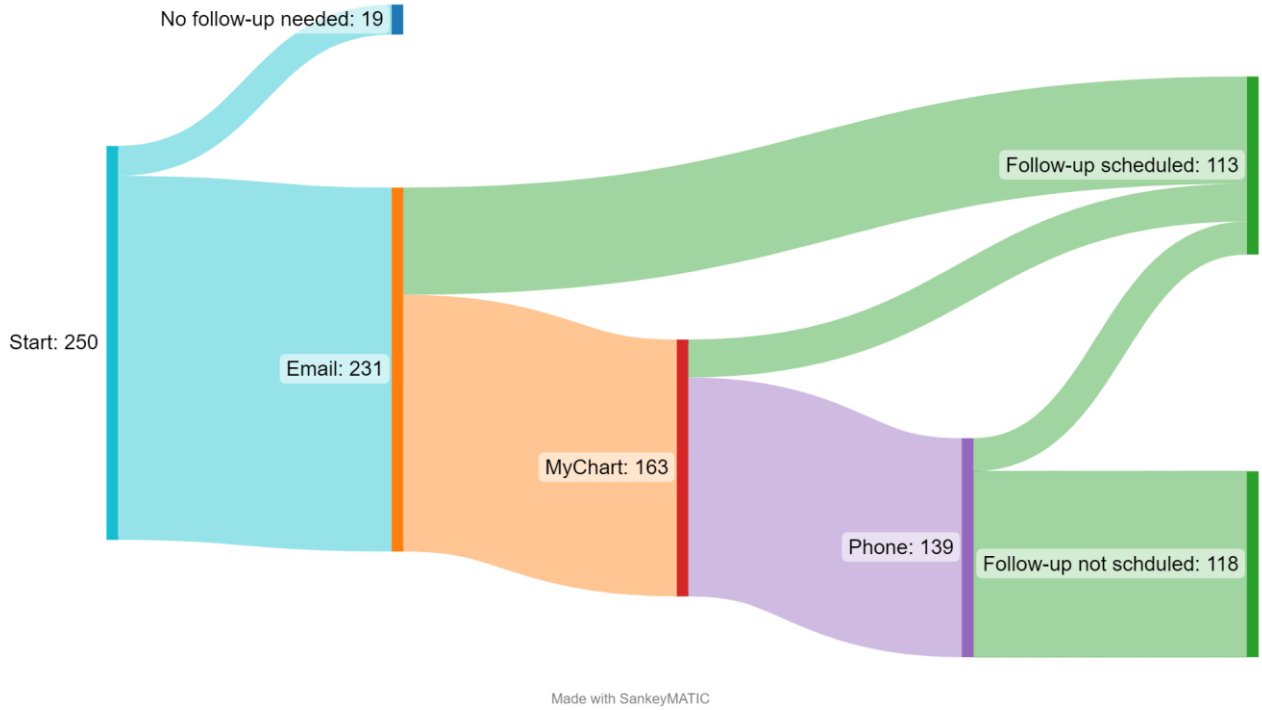
- **Outreach Method 1 Email:**
    - 19 patients did not need follow-up as they had left the practice, or their hypertension was being treated by another provider.
    - 231 patients received an initial email with an EHR scheduling link.
    - 68 patients scheduled an appointment post email outreach representing a 29% response rate.
- **Outreach Method 2 MyChart EHR Portal Message:**
    - 163 patients who did not schedule an appointment based on the initial email outreach received a MyChart EHR portal message reminding them to log into their EHR portal and schedule an appointment.
    - 24 patients scheduled an appointment post-EHR portal message outreach representing a 14.7% response rate.
- **Outreach Method 3 Nurse Telephonic Outreach:**
    - 139 patients who did not schedule an appointment based on initial email or subsequent EHR portal outreach received telephonic outreach from an ambulatory nurse reminding them to call the office and schedule an appointment.
    - 21 patients scheduled an appointment post telephonic outreach representing a 15% response rate.

SEMI Key Stakeholder Evaluation Recommendations:

- Email is the most effective method of outreach for the populations served in Southeast Michigan.
- Email outreach can be supplemented by EHR portal messaging and nurse follow-up phone calls to improve patient engagement in scheduling appointments.
- There is an opportunity to launch both email and portal messaging simultaneously to reduce outreach turn-around time and improve response rates.

- SEMI reported a variation in patient response between suburban and urban practice locations with a higher response rate in Ann Arbor suburban practice locations.
- An opportunity remains to evaluate socio-economic barriers and key demographic information such as language and insurance coverage to further improve outreach efforts and ambulatory nurse self-management and care coordination support.

FIGURE 5. SOUTHEAST MICHIGAN HYPERTENSION OUTREACH



Data Analysis and Outcomes

Hypertension population outreach data files were received from both Boise and Southeast Michigan for data evaluation. Pilot data files from both sites consistently included the fields in Table 1 below:

TABLE 1. PILOT DATA FIELDS

Patient Rank	Patient Age	Race	Ethnicity	Legal Sex	Outreach Method	DOS Post-outreach

1-250	18-75+	American Indian/Native Alaskan Asian Black Hawaiian White Other/Unknown/Declined	Hispanic/Latino Non-Hispanic/Latino	Female Male	Text Email EHR Telephonic	Yes No

Additionally, the Boise data file included the patient primary and secondary insurance carrier, primary and secondary language, primary care provider, CPT visit code where available, and post-follow-up visit dates and blood pressure values. The Boise data file did not include patient telephonic outreach data as the vendor opted not to share call center data once the decision was made to end the pilot program. Data files were combined and uploaded to Intellectus Statistics TM analysis software with analysis including descriptive statistics and quantitative analysis appropriate for the data provided.

Evaluation of the data provided determined it was comprehensive enough for the analysis of patient age, mode of outreach, and appointment scheduled and attended. The data provided was insufficient to compare program intervention effectiveness based on insurance coverage or ability to pay, language spoken, and blood pressure values. The additional Boise data did provide insight into the use of automated outreach for patients who do not speak English as a primary language or who are hearing impaired. There was insufficient sample size to determine statistical significance, but this finding could inform future outreach studies. Boise data also demonstrated blood pressure values at goal for patients who scheduled and attended follow-up appointments. Additional study is needed with larger sample sizes to determine the statistical significance of this finding. Overall recommendations regarding data analysis and outcomes include the need to establish required data fields at the beginning of the project and require the collection of these fields regardless of initial pilot findings to ensure an accurate evaluation of the program.

Descriptive Statistics

Cumulative frequencies and percentages were calculated for Age, Race, Outreach Method, and Date of Service (DOS) after Outreach Yes/No. The most frequently observed age group was 65-74 (*n* = 162, 32.40%). The majority of the participants were White (*n* = 430, 86.00%). The most frequently observed category of the Outreach Method was 1 Attempt (Text) (*n* = 250, 50.00%). The most frequently observed category of Date of Service (DOS) after Outreach Yes/No was No (*n* = 356, 71.20%). Frequencies and percentages are presented in Table 2a-c.

TABLE 2A: AGE GROUP

Age Group	Number of Patients	Percentage of Patients
18-24	4	0.80
25-34	11	2.2
35-44	34	6.8
45-54	62	12.4
55-64	105	21.0
65-74	162	32.4
75+	122	24.4
Missing	0	0.0

Note. Due to rounding errors, percentages may not equal 100%.

TABLE 2B: RACE POPULATION

Race	Number of Patients	Percentage of Patients
White	430	86.0
Black or African American	24	4.8
Declined	21	4.2
Native Hawaiian	2	0.4
Unknown	16	3.2
Other	3	0.6
Asian	4	0.8
Missing	0	0.0

Note. Due to rounding errors, percentages may not equal 100%.

TABLE 2C: OUTREACH METHOD

Outreach Method	Number of Patients	Percentage of Patients
1 Attempt (Text)	250	50.0
1 Attempt (Email)	102	20.4
2 Attempts (Email, MyChart)	23	4.6
3 Attempts (Email, MyChart, Phone)	125	25.0
Missing	0	0.0

Note. Due to rounding errors, percentages may not equal 100%.

Table 3 demonstrates the outreach population by age group broken out for the Boise and the SEMI hypertension outreach populations. The greatest number of patients in both the Boise and SEMI population samples are in the 65-74 age range. In this view, it is notable that most of the Boise population is aged 55-75+ and older while the majority of the SEMI population is aged 45-74.

TABLE 3: OUTREACH POPULATION BY AGE GROUP

Outreach	Age Group							No. of Patients
	18-24	25-34	35-44	45-54	55-64	65-74	75+	
Boise	3	4	11	19	46	89	78	250
Southeast Michigan	1	7	23	43	59	73	44	250
Grand Total	4	11	34	62	105	162	122	500

Table 4 demonstrates the outreach population by outreach method including the number of patients and the percentage of the population. The Boise pilot population is the only population to receive 100% text message support, accounting for 50% of the total pilot population. Although patients in the Boise pilot also received telephonic outreach, that data was not provided by the vendor and therefore was not included in the outreach method analysis. All patients in the SEMI population received an initial email. The population who did not schedule an appointment within 5 days of the email was sent a MyChart EHR portal message with a scheduling link. The population who did not schedule within 5 days of the portal message was

contacted by the SEMI centralized nurse call center and offered assistance to schedule an appointment.

TABLE 4: OUTREACH POPULATION BY OUTREACH METHOD

Outreach Method	No. of Patients	% of Total
1 Attempt (Text) Boise Only	250	50%
1 Attempt (Email)	102	20%
2 Attempts (Email, MyChart)	23	5%
3 Attempts (Email, MyChart, Phone)	125	25%
Grand Total	500	100%

Table 5 demonstrates the outreach population who did (yes) or did not (no) schedule an appointment within 30 days after outreach. Most patients (*n* = 356, 71.20%) did not schedule an office visit for recommended hypertension care. The 28.80% of patients who did schedule a follow-up appointment within 30 days of an outreach intervention did exceed the projected 10% appointment completion rate estimated as a minimum acceptable outcome in the financial analysis.

TABLE 5: DOS SCHEDULING FREQUENCY FOR NOMINAL AND ORDINAL VARIABLES

Date of Service scheduled after outreach? (Yes or No)	Number of Patients	Percentage of Patients
No	356	71.20
Yes	143	28.60
yes	1	0.20
Missing	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Tables 6a-c demonstrate outreach results by region and age, by age alone, and by age group. Boise had a success rate of 12.8% with 32 patients scheduling and attending a follow-up hypertension office appointment post-text outreach. The age range of the Boise population scheduling and attending office visits was 35-87 years. SEMI had a success rate of 44.8% with 112 patients scheduling and attending a follow-up hypertension office appointment post

outreach via one or all three outreach methods, email, EHR portal message, and nurse phone call. The age range of the SEMI population scheduling and attending office visits was 27-83 years. For both pilot locations, most patients who scheduled outreach were in the 65-74 age range (n=47).

TABLE 6A: OUTREACH RESULT BY REGION AND AGE

Outreach	Region	No. of Patients	Minimum Age	Average Age	Maximum Age
No DOS Scheduled	Boise	218	21	68	100
No DOS Scheduled	SE Michigan	138	24	60	84
No DOS Scheduled	Both	356	21	65	100
Scheduled DOS After Outreach	Boise	32	35	66	87
Scheduled DOS After Outreach	SE Michigan	112	27	63	83
Scheduled DOS After Outreach	Both	144	27	64	87
Grand Total		500	21	65	100

TABLE 6B: OUTREACH RESULT BY AGE

Outreach	No. of Patients	Min Age	Average Age	Max Age
No DOS Scheduled	356	21	65	100
Scheduled DOS After Outreach	144	27	64	87
Grand Total	500	21	65	100

TABLE 6C: OUTREACH RESULT BY AGE GROUP

	Age Group							
Outreach	18-24	25-34	35-44	45-54	55-64	65-74	75+	No. of Patients
No DOS Scheduled	4	9	24	37	77	115	90	356
Scheduled DOS After Outreach		2	10	25	28	47	32	144
Grand Total	4	11	34	62	105	162	122	500

Two-Tailed Independent Samples *z*-Test

A two-tailed independent samples *z*-test was conducted to examine whether the mean of the population age as of the May 2023 data analysis was significantly different between the Boise and SEMI regions. The results of a Shapiro-Wilk test for normality were significant based on an alpha value of .05, $W = 0.98$, $p < .001$. This result suggests the difference in mean population age is unlikely to have been produced by a normal distribution, indicating the normality assumption is violated. The result of the two-tailed independent samples *z*-test was significant based on an alpha value of .05, $z = 4.67$, $p < .001$, indicating the null hypothesis can be rejected. This finding suggests the mean age of the Boise and SEMI populations was significantly different with the mean age of the Boise pilot sample significantly higher than the mean age of the SEMI pilot sample. The results are presented in Table 7. A bar plot of the means is presented in Figure 6.

TABLE 7: TWO-TAILED INDEPENDENT SAMPLES Z-TEST FOR AGE BY REGION

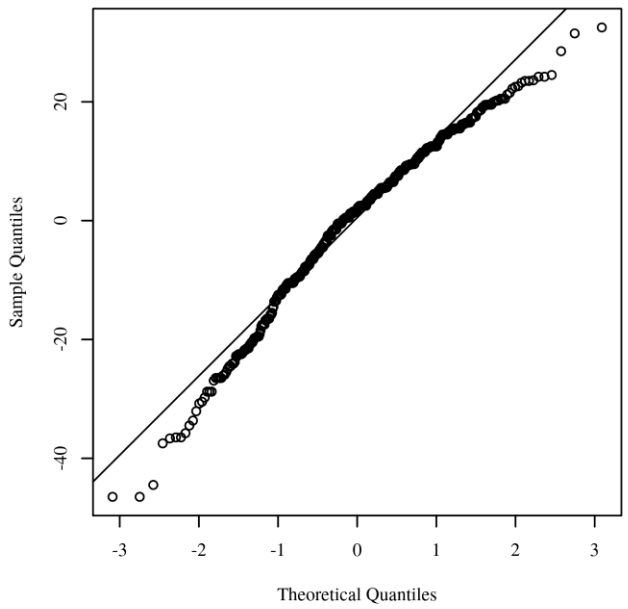
	Boise			SE Michigan				
Variable	***M***	***SD***	***n***	***M***	***SD***	***n***	***z***	***p***
Age (as of May 2023)	67.43	14.11	250	61.73	13.17	250	4.67	< .001

Note. N = 500.

Linear Regression Analysis

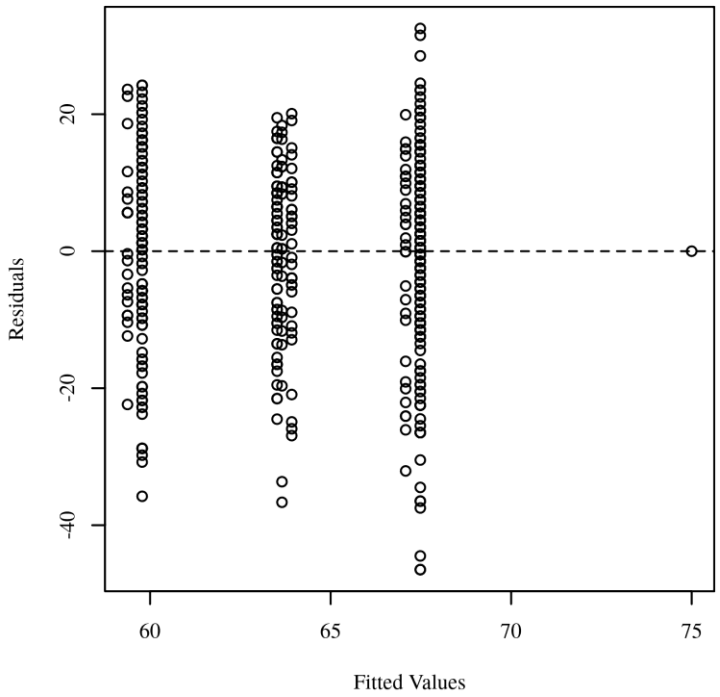
A linear regression analysis was conducted to assess whether the outreach method and scheduled data of service after outreach was significantly predicted by the patient's age. The assumption of normality was assessed utilizing a Q-Q scatterplot (DeCarolo,1997). The assumption of normality was met as parametric testing demonstrated no strong deviation noted in the Q-Q scatterplot. Figure 6 presents a Q-Q scatterplot of the model residuals.

FIGURE 6: Q-Q SCATTERPLOT FOR NORMALITY OF THE RESIDUALS FOR THE REGRESSION MODEL



Homoscedasticity was evaluated by plotting the residuals against the predicted values (Bates et al., 2014; Field, 2017; Osborne & Walters, 2002). The assumption of homoscedasticity was met as the points appear randomly distributed with a mean of zero and no apparent curvature. Figure 7 presents a scatterplot of predicted values and model residuals.

FIGURE 7: RESIDUALS SCATTERPLOT TESTING HOMOSCEDASTICITY



Variance Inflation Factors (VIFs) were calculated to detect the presence of multicollinearity between predictors. It is preferred to have the VIF of a variable less than 5 and with a maximum upper limit of 10 (Menard, 2009). Multicollinearity was not detected as VIFs were calculated at 1.5. Table 8 presents the VIF for each predictor in the model.

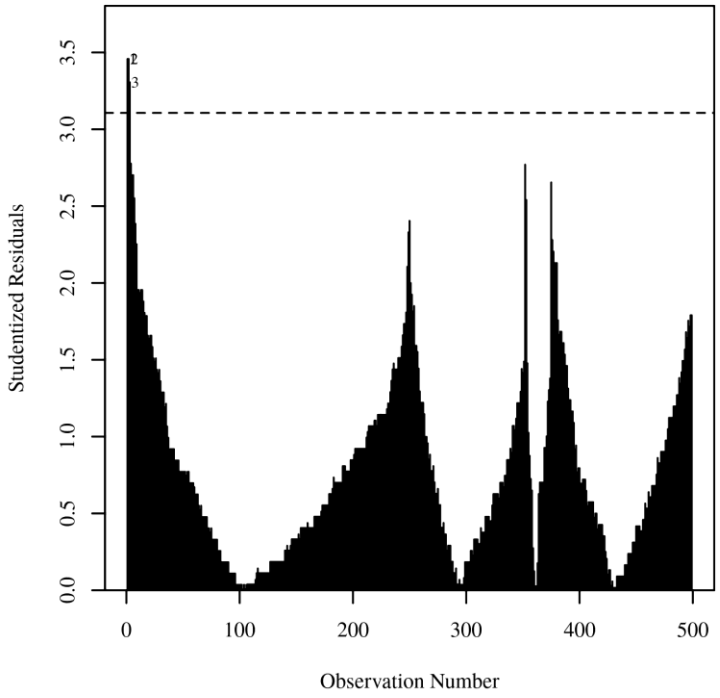
TABLE 8: VARIANCE INFLATION FACTORS FOR OUTREACH METHOD AND DATE OF SERVICE AFTER OUTREACH

Variable	VIF
Outreach Method	1.51
DOS after Outreach (yes/no)	1.51

Studentized residuals were calculated by dividing the model residuals by the estimated residual standard deviation. To identify the presence of outliers, the absolute values were plotted against the observation numbers (Field, 2017; Pituch & Stevens, 2015). Observed outliers were detected with a significant Studentized residual result greater than 3.11 in absolute value.

Figure 8 presents the Studentized residuals plot of the observations. Observation numbers are specified next to each point with a Studentized residual greater than 3.11.

FIGURE 8: STUDENTIZED RESIDUALS PLOT FOR OUTLIER DETECTION



The results of the linear regression model were significant, $F(5,494) = 5.63$, $p < .001$, $R^2 = .05$, indicating that approximately 5.39% of the variance in age is explainable by outreach method and scheduled date of service yes/no. There was a statistically significant decrease in the mean value of age by 7.70 units for the population who received three attempts of outreach (Email, MyChart, Phone) $B = -7.70$, $t(494) = -5.16$, $p < .001$. The yes category of the scheduled date of service after outreach did not significantly predict age, $B = -0.41$, $t(494) = -0.25$, $p = .806$.

Fischer's Exact Test

A Fisher's exact test was conducted to examine whether the age group and outreach method were independent. The results of the Fisher exact test were significant based on an alpha value of .05, $p < .001$, suggesting that age group and outreach method are related to one another. The following level combinations had observed values that were greater than their expected values: age 18-24 and text; age 25-34 and phone; age groups 35-44, 45-54, 55-64, and 65-74 email, portal message, and telephone; age 75+ text, email, and portal message. See Table 9 for outcomes of the Fisher exact test.

TABLE 9: OBSERVED AND EXPECTED FREQUENCIES

	Outreach Method				
Age_Group_Ordinal	1 Attempt (Text)	1 Attempt (Email)	2 Attempts (Email, MyChart)	3 Attempts (Email, MyChart, Phone)	
18-24	3[2.00]	0[0.82]	0[0.18]	1[1.00]	$p <$ .001
25-34	4[5.50]	0[2.24]	2[0.51]	5[2.75]	
35-44	11[17.00]	8[6.94]	1[1.56]	14[8.50]	
45-54	19[31.00]	14[12.65]	3[2.85]	26[15.50]	
55-64	46[52.50]	25[21.42]	5[4.83]	29[26.25]	
65-74	89[81.00]	38[33.05]	6[7.45]	29[40.50]	
75+	78[61.00]	17[24.89]	6[5.61]	21[30.50]	

Note. Values formatted as Observed[Expected].

Kruskal-Wallis Test

The non-parametric Kruskal-Wallis rank sum test was conducted as an alternative to the ANOVA due to violations in distribution assumptions (Conover & Iman, 1981). The results of the Kruskal-Wallis test were significant based on an alpha value of .05, $\chi^2(3) = 28.68$, $p < .001$, indicating that the mean rank age was significantly different between the levels of outreach

method. This information can be used to inform the selection of outreach mode by age range demographic. Table 10 presents the results of the Kruskal-Wallis rank sum test.

TABLE 10: KRUSKAL-WALLIS RANK SUM TEST FOR AGE BY OUTREACH METHOD

Level	Mean Rank	χ^2	*df*	*p*
1 Attempt (Text)	281.98	28.68	3	< .001
1 Attempt (Email)	235.95			
2 Attempts (Email, MyChart)	251.65			
3 Attempts (Email, MyChart, Phone)	199.20			

Cost/Benefit Analysis

The pilot evaluation included a formal cost/benefit analysis conducted by the Trinity Health system office director of employed medical group financial operations prior to implementation. The analysis was performed in June 2022 and identified the current gap to target for patients with a diagnosis of hypertension not at the blood pressure goal in each of Trinity Health's regional markets. The analysis calculated the estimated relative value unit (RVU) cost including staff salary and operational expenses for a chronic condition office visit less projected reimbursement. To ensure a conservative estimate, the maximum RVU expense for a chronic condition visit and the average Medicare reimbursement rate by the market was used in the calculation. The cost of initial vendor setup and contracted outreach expense was applied to the total denominator of the targeted hypertension population in the market. The total revenue minus expense was calculated at cut points of 10, 20, 30, and 40 percent of completed visit rates. The positive cost/benefit ratio was estimated at a minimum of $226,132 for both markets at a 10% appointment completion rate for the estimated 28,369 patients not at goal.

The financial analysis across all Trinity Health markets demonstrated a positive cost/benefit ratio of nearly $1 million for approximately 125,000 patients at a 10% appointment

completion rate. The positive financial analysis demonstrated minimal risk of a pilot of 250 hypertension patients in each targeted market. The estimated maximum cost per patient assuming all methods of outreach were applied calculated to be $6.50 per patient for a total cost by market of $1,625 and projected revenue at a 10% appointment completion rate of $69,208 in the Boise market and $156,924 in the Southeast Michigan market. It is important to note that a determination was made by medical group leadership to assume current outreach costs in Southeast Michigan were similar to and not exceeding expected vendor outreach costs in the Boise market. A separate financial analysis was not completed for the costs attributed to the Southeast Michigan EHR bulk outreach functionality and nurse call center. This is noted to be an opportunity for future evaluation as the cost of routine outreach inclusive of nurse call line intervention may exceed more automated electronic outreach approaches and should be reserved for patients who do not respond to automated outreach interventions or who require additional self-management or care coordination support.

TABLE 11: HYPERTENSION OUTREACH PILOT COST/BENEFIT ANALYSIS

	REIMBURSEMENT LESS EXPENSES					
HYPERTENSION	GAP # of Patients - Average	wRVUs	Reimbursement per wRVU	Total Reimbursement	PC Provider Salary & Benefits per wRVU - $57.17	Reimbursement Less Expense
Oregon-Idaho	8,682	1.92	$ 132.54	$ 2,209,463	$ 953,033	$ 1,256,430
Southeast Michigan	19,687	1.92	$ 132.54	$ 5,009,815	$ 2,160,941	$ 2,848,874
Trinity Health	124,883			$ 31,779,748	$ 13,707,924	$ 18,071,824

	SUCCESS RATE			
HYPERTENSION	10% Success	20% Success	30% Success	40% Success
Oregon-Idaho	$ 125,643	$ 251,286	$ 376,929	$ 502,572
Southeast Michigan	$ 284,887	$ 569,775	$ 854,662	$ 1,139,550
Trinity Health	$ 1,807,182	$ 3,614,365	$ 5,421,547	$ 7,228,730

HYPERTENSION	OUTREACH COSTS			
	Text Cost - $0.04 @ 100%	Email Cost - $0.08 @ 50%	Call Cost - $2.14 x 6 Min @ 50%	Total Outreach Costs
Oregon-Idaho	$ 347	$ 347	$ 55,741	**$ 56,435**
Southeast Michigan	$ 787	$ 787	$ 126,389	**$ 127,964**
Trinity Health	$ 4,995	$ 4,995	$ 801,747	**$ 811,738**

HYPERTENSION	NET IMPACT			
	Net Financial Statement Impact - 10%	Net Financial Statement Impact - 20%	Net Financial Statement Impact - 30%	Net Financial Statement Impact - 40%
Oregon-Idaho	**$ 69,208**	**$ 194,851**	**$ 320,494**	**$ 446,137**
Southeast Michigan	**$ 156,924**	**$ 441,811**	**$ 726,699**	**$ 1,011,586**
Trinity Health	**$ 995,445**	**$ 2,802,627**	**$ 4,609,810**	**$ 6,416,992**

Program Evaluation

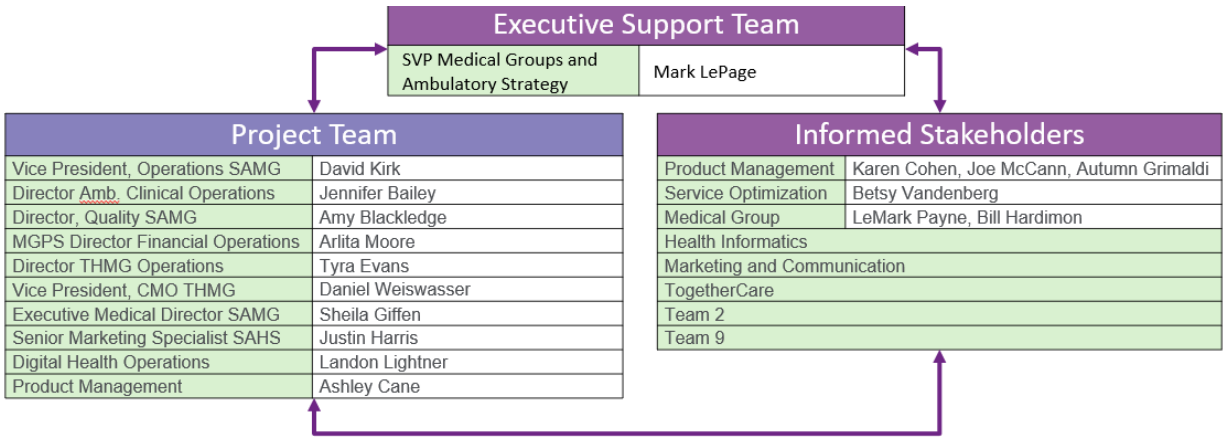
The evaluation of this pilot follows the six components of the CDC Program Performance and Evaluation framework while measuring leading and lagging metrics inclusive of quality and financial indicators to determine program utility, feasibility, propriety, and accuracy (CDC, 2022). The six steps of the evaluation framework include engaging stakeholders; describing the program; focusing on evaluation design; gathering credible evidence; justifying conclusions; ensuring the use of evaluation findings. These steps occur within the context of program utility, feasibility, propriety, and accuracy standards (CDC, 2022). This framework provides a practical, stepwise approach to evaluating public health programs.

Key Stakeholders

The first step in the CDC program performance evaluation assesses the inclusion and engagement of key stakeholders necessary for organizational buy-in and operational support of the pilot (CDC, 2022). The evaluation includes a review of the stakeholders identified in the organizational assessment as well as any key individuals identified during implementation to

make recommendations on roles necessary for program support, development, implementation, evaluation, and sustainability. The evaluation of key stakeholders for the hypertension outreach comparison pilot included regional administration and provider representation charged with operationalizing the pilot at a local level to determine benefit from the perspective of those who are charged with daily outreach work. While the evaluation included care team members, it did not include patient representation as leadership did not approve patient experience survey data as in scope for this pilot. The Boise and SEMI core team included a Trinity Health system office executive leader sponsor, population health clinical operations nurse leader, marketing and communications project manager, and health information technology project manager, in addition to the regional medical group administrative and clinical team members. An example of the pilot team stakeholders for the Boise market is outlined in Figure 11. A similar composition of team stakeholders participated in the development, deployment, and evaluation of the SEMI pilot.

FIGURE 11: EXAMPLE OF PROJECT STAKEHOLDER TEAM



The CDC evaluation framework (2022) standards for a good evaluation include utility standards that ensure appropriate stakeholder identification and evaluator credibility. The engaged stakeholder team represented all administrative and care team members involved or affected by the outreach pilot. As previously stated, the stakeholder team did not include patient

representation. This is a noted gap and may have assisted with the development of messaging that proved to be more effective at driving patient engagement in appointment scheduling. The stakeholder team did include subject matter experts in the design, delivery, and support of ambulatory care, population health management strategies, and information technology support. This team was able to make informed recommendations on the feasibility standards of the pilot including practical outreach procedures and the cost-effectiveness of interventions. A recommendation for future outreach efforts is to include diverse patient representation to inform the design of outreach messaging and methods for optimal effectiveness.

Program Description

The second step of the CDC evaluation framework includes a complete description of the program from planning, pre-implementation, implementation, and post-implementation perspectives. The CDC Program Performance and Evaluation model (2022) includes an assessment of program needs, expected effects, implementation activities or interventions, necessary resources, program maturity, the context in which the program operates, and the logic model used as part of this evaluation phase. A strength noted within this pilot was the CDC steps were used to outline the program deliverables and timeline using a Gantt Chart format for each pilot site. Additionally, a routine weekly cadence of design, implementation, and evaluation meetings was scheduled and held with each of the pilot sites. These meetings included a formal agenda, minutes, and project management facilitation of deliverables to ensure discussion and agreement on project goals, measures of success, resources, and supporting implementation activities. A weakness within this outreach pilot was the project team experienced an initial lack of clarity on the project goals and the department leading the project impacting the political viability of the pilot. This project was initially viewed as a marketing and communications strategy utilizing digital technology for outreach. While those aspects of the project were important, the goal was centered on improving the blood pressure management outcomes of the hypertension population cared for in Trinity Health employed primary care practices using

patient outreach as an appointment scheduling engagement strategy. It took several weeks to level set on this change of perspective and to identify the director of ambulatory clinical operations as the pilot lead. A key recommendation would be to incorporate an initial meeting of executive leadership stakeholders to ensure alignment on the direction given to the operational team charged with designing, implementing, and evaluating the pilot.

The comparison pilot addresses the CDC program evaluation framework (2022) propriety standards including ensuring the service orientation of the pilot remained focused on improving outcomes for the targeted hypertension populations in Boise and SEMI. The pilot implementation plans included core work to ensure formal agreements were in place with the regional pilot teams and the vendor to protect the privacy and data security of patients receiving the outreach intervention. The rights of participants were respected through a review of the pilot by Trinity Health's legal, and integrity & compliance departments. The pilot received an expedited review by the UDM IRB. The pilot also aimed to ensure a complete and fair assessment of efforts including financial and operational viability through the implementation of weekly project tracking to promote transparency of pilot efforts and outcomes to the pilot team, vendor partner, and executive leadership.

Evaluation Design

The evaluation design included the program's purpose to engage the hypertension population not at blood pressure goal in the receipt of recommended care. The benefits of the pilot included the potential for improved hypertension management outcomes, improved revenue from completed office visits, and reduced outreach demand on office staff. The question the program evaluation sought to answer: Did a vendor-delivered automated outreach intervention engage patients in the completion of recommended care at a higher rate than current ambulatory office-initiated email/portal messages followed by nurse phone calls? The evaluation data would indicate that the Boise text automated outreach pilot was not as effective

as the standard outreach intervention deployed in SEMI although this may not be a fair assessment as the recommendations for the Boise text intervention were not able to be implemented and the SEMI data was not as comprehensive.

The program evaluation was designed to inform a system-wide standard for patient outreach interventions inclusive of supporting technical tools and operational workflow. The pilot evaluation focused on the comparison of pilot effectiveness on rates of engagement as measured by scheduled and completed appointments. The evaluation also included a comparison of the effectiveness of the modes of communication across patient demographics to inform the most effective outreach strategies and best use of care team members in outreach including the identification of populations who would benefit from initial outreach from an ambulatory nurse rather than automation or a non-clinical team member. The pilot was to include rates of blood pressure control for the intervention population as the lagging outcome metric, but the abstraction of this data was incomplete in the SEMI region due to the decision to end the Boise vendor-assisted text outreach pilot. This represented a substantial weakness in the pilot and an opportunity in future efforts to ensure agreement on critical data components to ensure effective evaluation.

Statistical analysis used descriptive statistics and quantitative analysis appropriate for the pilot data available including z-test, linear regression analysis, Fisher's Exact Test of Independence, and the Kruskal-Wallis Test. The health system analytics and data science team at the system office and regional level were unable to engage in the analysis of the pilot due to competing priorities and the determination that the pilot was no longer an emergence team initiative. The vendor did not engage in formal analysis of the pilot as the pilot ceased before the vendor's recommendation to repeat text outreach incorporating lessons learned as part of a rapid improvement cycle could be implemented. The pilot data analysis was impacted by the variability of data collected between the Boise pilot and the SEMI pilot. It should be noted that

the data fields collected that were consistent between the pilot regions did meet expected accuracy standards including a standard procedure for targeted hypertension pilot population identification and de-identification of patient data. The defined data fields for collection of intervention mode, response, and scheduled appointment were appropriate for the project context of outreach intervention and engagement in appointment scheduling.

Analysis of qualitative information included executive summaries of pilot results presented to the pilot team and system office leadership. The Boise data did include primary language, a field that was not collected in the SEMI data. While there was not enough data to perform statistical analysis by primary language, a qualitative finding is that patients whose primary language was not English (n=50) or who were hearing impaired (n=1) did respond to the text message by scheduling and attending an appointment at a higher rate, 21.5% versus the overall Boise population at 12.8%. This finding requires further study but may support text messaging as a preferred method of communication for patients whose primary language is not English or for those with a hearing impairment. The Boise pilot data also included primary and secondary insurance; the SEMI pilot data did not include this information. Only three patients in the Boise pilot were uninsured. None of these uninsured patients scheduled or attended an appointment for hypertension management post-outreach intervention. This is an opportunity for further study as financial barriers such as lack of healthcare coverage is a known influencer of declined and deferred healthcare (Okeke et al., 2021).

An analysis of quantitative information demonstrated a 12.8% positive response rate to text outreach compared to a 44% positive response rate to routine outreach using email, portal messaging, and nurse telephonic follow-up. Additionally, the analysis demonstrated statistically significant differences in the effectiveness of outreach by mode by age group with the Kruskal-Wallis Test observing values greater than expected values for the following ages by outreach mode: age 18-24 and text; age 25-34 and phone; age groups 35-44, 45-54, 55-64, and 65-74

email, portal message, and telephone; age 75+ text, email, and portal message. These findings suggest text messages may be most effective for age groups 18-24 and 75+, while combined email and portal outreach is best for age groups 35-74.

Credibility of Evidence

The information gathered in the evaluation should be "believable, credible, and relevant" to support the evaluation of the program (CDC, 2002). This includes the appropriate selection of indicators to evaluate the program's success including leading and lagging metrics such as the number of appointments scheduled because of outreach and achievement of hypertension outcome target for the outreach population. The data sources included outreach and appointment scheduling data but did not include blood pressure data results for each patient who scheduled and attended a post-outreach appointment for the SEMI pilot. The expected analysis did not occur for blood pressure values prior to, and post-outreach as initially defined in project outcomes. It should be noted that the Boise data file did contain blood pressure values for the 32 patients who scheduled and attended a post-outreach hypertension office visit. 26 of the 32 blood pressures taken at these visits met the well-managed blood pressure criteria of both a systolic blood pressure < 140 mmHg and a diastolic blood pressure of <90 mmHg. This represents 81% achievement of well-managed blood pressure for the Boise patients who attended a follow-up visit. Anticipated additional data including vendor and internal ambulatory nurse outreach report narrative data regarding barriers to scheduling appointments and interventions provided were not collected in Boise prior to the determination to end the pilot. The vendor subsequently declined to provide additional information. The SEMI team determined they would not collect this qualitative information due to resource constraints balanced with the determination that vendor-supported text outreach would not be made available in the future.

Justification of Conclusions

The components of program justification include standards, analysis and synthesis, interpretation, judgment, and recommendations (CDC, 2002). The purpose of the justification of conclusions is to provide impartial and explicit information so the stakeholders can determine the worth of the evaluation. In this pilot, financial success is achieved at a 10% or higher completion rate of billable office visits as a result of vendor or internally-supported outreach. The pilot achieved this financial goal at a 12.8% completed appointment rate for post-vendor-supported outreach and a 44% completed appointment rate for internally supported bulk outreach combined with nurse telephonic outreach. Clinical success including patients achieving blood pressure goals post-intervention occurred for 26 of the 32 Boise patients who scheduled and attended an appointment. Further studies are necessary to understand if patient outreach is a predictor of hypertension blood pressure control. Additional study is needed to understand the best use of nurse telephonic outreach services, although some assumptions can be made based on the results of this pilot regarding the age of individuals who prefer telephonic outreach.

Sharing Lessons Learned

This portion of the CDC evaluation focuses on planning for and disseminating evaluation findings. This is inclusive of the organization of the evaluation, determining how findings will be used, ensuring appropriate use of findings, providing feedback to stakeholders, and sharing the program with evaluation to broader audiences (CDC, 2022). Specific to this project, the lessons learned were meant to inform the health system adoption of one of the pilot programs or inform the decision to move forward with a national request for a proposal for a new vendor-supported patient outreach solution. The initial executive summary of the Boise pilot post-text outreach to 250 patients with 30 days run out to capture appointments scheduled and blood pressure values led to a Trinity Health leadership decision to abandon the vendor pilot and not repeat the text outreach intervention based on lessons learned. This determination influenced the data availability and analysis of the Boise pilot and influenced the amount of data gathered for analysis in the SEMI pilot. The Trinity Health standard solution for patient outreach relies solely

on TogetherCare Epic EHR bulk outreach functionality at the current time. This bulk outreach functionality is inclusive of patient letters, portal messages, and nurse telephone calls. Currently, TogetherCare does not include automated text outreach functionality.

Discussion and Conclusion

Lessons learned from the Boise and SEMI hypertension outreach pilot program development and evaluation have not been incorporated into the current Trinity Health proactive population health outreach strategy. There is an opportunity to review these learnings as they relate to the implementation of bulk outreach standard work in ambulatory practices, specifically regarding efforts to automate email and portal message outreach and prioritize nursing telephonic outreach. Key learnings include the importance of considering automated text outreach efforts as part of automated bulk outreach efforts to promote efficiency and sustainability of a standardized outreach program; designing outreach communication to include the provider and office practice name and rationale for the office visit; and reserving telephonic nursing outreach for patients who do not respond to other forms of outreach. At the time of this program evaluation, a determination was made in the Boise market to move forward independently with automated text outreach utilizing the CareNet vendor solution in addition to Trinity Health system office-supported bulk outreach efforts utilizing the TogetherCare EHR. The SEMI team decided independently to focus nurse telephonic outreach efforts on the African American male hypertension population as part of a targeted improvement effort to address health equity and disparities in care. This targeted outreach effort will include the use of EHR bulk outreach functionality and nurse call line outreach.

A recent decision was made at the Trinity Health executive level to adopt new Epic EHR customer relationship management (CRM) functionality in the TogetherCare EHR called Cheers. The Cheers CRM functionality is inclusive of prioritized automated patient outreach which can be supplemented by a 24/7 365 nurse call center. The design and implementation of

Cheers across the Trinity Health national footprint will be led by a newly formed TogetherCare Epic team partnered with the Marketing and Communications digital health strategies team. It is unknown how and when the current bulk outreach proactive population health outreach effort will integrate with this work. Likely bulk outreach interventions will be included in a more comprehensive Cheers CRM strategic outreach plan. TogetherCare leadership is evaluating text messaging functionality as a future enhancement. The leadership team investigating this functionality has requested a copy of this program evaluation.

Implications for Nursing Practice, Policy, and Research

The sustainability of any large-scale automated outreach effort is reliant on leadership support of technology and staffing resources to implement standard patient engagement and scheduling support interventions. The lessons learned from this pilot implementation include the need for rapid test of change cycles including near real-time data evaluation to remain relevant with organizational strategic decisions. Specifically, a clinical and business case must be made for the continuation and expansion of automated outreach including the demonstration of value to the targeted population, the applicability of the intervention across geography (Trinity Health operates in 25 states), and the feasibility of applying automated outreach interventions to additional chronic illness, preventive health, and screening topics. A key strategy for sustainability relies on continued engagement of key stakeholders including ambulatory clinical teams, marketing, and communications, technology and health informatics, legal and integrity, and executive leadership teams. Continuation and expansion of ambulatory outreach across a large national health system will require an investment in either or both internal and external technical and staffing resources. These investments will need to be reflected in system-wide or regional health system budgets depending on the capital threshold investment. A process for standardized adoption and use of ambulatory workflow will need to be developed to ensure optimal use of the resource and return on investment. This will require recommendations at the system office or corporate level that are disseminated to regional leadership teams who

collaborate with local provider practices to deploy technology based on patient population needs and access capacity.

Automated outreach presents an opportunity to engage patients in receipt of upcoming or deferred recommended care. The use of automation as an initial outreach tool has the potential to reduce the burden of appointment reminders and scheduling outreach for non-clinical and clinical staff allowing these staff to focus on engaging patients who need additional support to complete recommended care. The implications for ambulatory nursing include targeting nurse-patient outreach to individuals who would most benefit from self-management, care coordination, and socio-economic barrier support to improve clinical outcomes.

Dissemination Plan

Lessons learned from this pilot implementation and program evaluation will be shared as part of the UDM DNP project presentation and distributed via email to Trinity Health medical group and population health leadership. The program implementation and evaluation may inform the future structure of patient outreach design, and implementation activities. There is an opportunity to submit a synopsis of this pilot for publication to journals focused on population health, ambulatory care, and optimization of patient information technology.

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