A Quality Improvement Initiative to Implement a Risk Stratified Population Health Tool in Primary Care

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Abstract

Background: The U.S. primary care health system seeks innovative solutions to address population health and quality of care while reducing costs. Risk stratification programs offer strategies to improve quality of care and manage health care costs through efficient resource allocation. This quality improvement (QI) initiative aimed to implement a risk stratification program at a safety net primary care clinic in Oregon.

Local Problem: A safety net clinic in the Portland area lacked a risk stratification process, impeding their ability to identify and manage high-risk patients, improve population health outcomes, and participate in value-based payment contracts.

Methods: The QI project utilized the Plan-Do-Study-Act (PDSA) cycle methodology to guide the project. A multidisciplinary team selected and integrated the Risk of Hospital Admission or ED Visit Stratification (RHA/EDVS) risk stratification tool into the clinic's electronic health record (EHR), trained staff on population health and risk stratification, and implemented workflows to mitigate risk. Pre- and post-implementation surveys measured staff knowledge gains. Process measures included trainings delivered, workflows developed, and high-risk rosters created.

Interventions: Interventions included implementing a risk stratification tool into the health record, educating care team members on population health and risk stratification models, and development of workflows that featured risk scores while incorporating patient centered strategies to mitigate risk. Three PDSA cycles were iterated, building team member knowledge and refining workflows by integrating participant feedback.

Results: Pre/post survey results (n=15) demonstrated increased team member confidence in and perceived value of risk stratification. 627 patients were stratified as high-risk. However, risk mitigating interventions showed limited gains. Qualitative feedback on pre/post survey results indicated staff found the tool valuable but highlighted a need for additional resources.

Conclusions: Implementing a risk stratification program in primary care is feasible and improves staff confidence in population health principles. More study is needed to better understand which mitigating factors may mitigate risk. The project demonstrated the value of PDSA cycle methodology and multidisciplinary collaboration.

Introduction

Problem Description

Amid rising costs and health outcomes that do not match those of other developed countries, the US Healthcare system is tasked with devising new ways to provide care to address the triple aim of improved population health, increased quality of care, and reduced costs. In 2021 U.S. healthcare spending grew 2.7 percent, rising to 4.3 trillion dollars annually, and accounts for 18.3 percent of the US Gross Domestic Product (Centers for Medicare & Medicaid Services, n.d.). In Oregon, total health care expenditures increased 3.5% from 2020 to 2021, and totaled 31.07 billion dollars in 2021 (Oregon Health Authority, 2023a). The ability to optimize resource allocation by identifying patients who may most benefit from scarce resources is a foundational component of a population health care approach to care delivery (Low, 2017).

Risk stratification tools are algorithms that utilize information including patient diagnoses, health care utilization, demographics, and socioeconomic data to stratify patients into risk categories that may predict poor health outcomes (Nalin et al., 2016; Ross et al., 2017). Primary care systems are intended to work with patients to prevent hospital admissions, reduce Emergency Department (ED) utilization, and manage common health conditions (National Committee for Quality Assurance, 2023). By risk stratifying patients in primary care organizations, scarce resources can be prioritized for the highest risk patients and populations in an attempt to improve health equity (Nong and Adler-Milstein, 2021; Jin et al., 2016; Kingston et al., 2020).

Implementation of risk stratification tools to identify and prioritize high risk patients shows possible benefits for the healthcare system. Early evidence demonstrates reduced hospital admissions, lower ED utilization, and lower healthcare costs (Russell et al., 2018; Snooks et al., 2019; Kingston et al., 2020). Because of these optimistic outcomes, value-based reimbursement agencies and Accountable Care Organizations in Oregon are linking adoption of risk stratification methodologies to full payment opportunities and to full certification as Patient Centered Primary Care Homes (PCPCH) (Cantiello, 2022; Kingston et al., 2020). Reimbursement associated with PCPCH certification is imperative to fund population health outcomes of historically marginalized and at-risk communities.

The Whole Health Clinic is a safety net PCPCH clinic in the Portland metropolitan area. The clinic delivers care across the lifespan to at-risk communities, and they do not have a risk stratification process to identify the highest risk patients. This Quality Improvement (QI) project is comprised of implementing a risk stratification program at the Whole Health Clinic.

Available Knowledge

Several factors have been identified in the literature as critical to the successful implementation of a risk stratification program in primary care. A primary element of successful programs relied on the development and coordination of a multidisciplinary team to implement tool deployment and the integration of a high-quality operational plan outlining the program's core strategic objectives (Nalin et al., 2016; Mora et al., 2017; Ross et al., 2020; Marafino 2021). Staff training on population health principles was another key to success in several studies (Nalin et al., 2016; Mora et al, 2017; Ross et al., 2020). Highly trained RN staff and the capacity to engage in care coordination and self-management education support were contributing factors in one study (Reynolds et al., 2018).

Factors that tend to inhibit implementation of a risk stratification tool include lack of clinician support for the tool and lack of provider engagement resulting from perceived "false negatives" and "false positives" from the algorithmic risk scores (Nalin et al., 2016; Nong and

Adler-Milstein, 2021; Higgins Omalley and Keith; Ross et al., 2020). Concerns about tool validity can be addressed by supplementing calculated risk scores with provider knowledge and allowing care teams the opportunity to manually opt patients into high-risk categories (Nong and Adler-Milstein, 2021). Lack of training and education for staff about population health principles negatively impacted risk stratification implementation (Malin et al., 2026). Inefficient use of staff time and lack of leadership commitment were other issues impeding implementation (Nong and Adler-Milstein, 2021; Paridhi et al. 2022). Low utilization of Electronic Health Record (EHR)-linked tools was a factor in two studies (Cykert et al., 2020, Nalin et al., 2016). Lack of provider buy-in was a substantial barrier to implementation in multiple studies (Nong Adler-Milstein 2021; Higgins Omalley and Keith; Ross et al., 2020). To combat provider mistrust of risk scores and increase provider buy-in, allowing for provider input on risk tool implementation was identified as a successful opportunity for engaging physician buy-in to risk stratification implementation, and the inclusion of human review was associated with significantly higher confidence in the risk stratification process (Nong Adler-Milstein 2021; Higgins Omalley and Keith; Ross et al., 2020). Several studies pointed to the value of robust QI principles including supported change management processes using informatics tools and the ability to iterate changes (Mora et al, 2017; Hannah and Roseman, 2017; Cykert et al., 2020).

Rationale

The Whole Health Clinic is part of a Federally Qualified Health safety net system. The clinic does not have a risk stratification program which is required for top tier PCPCH designation, and optimization of value-based payment contracts. A root cause analysis conducted by the QI Lead identified themes that threatened the implementation of integrating a risk stratification tool for improved population health management. Themes included insufficient knowledge among care team members about population health principles and risk stratification models, insufficient provider and leadership buy in regarding the value of risk stratification, no tool for risk stratification, and understudied EHR capabilities. Root cause analysis around

barriers to program included assumptions based on feedback from team members during informal conversation. The themes identified in the root cause analysis within the organization mirrored the themes described in the literature review (Appendix 1).

The Institute for Healthcare Improvement (IHI) model for improvement is a widely used framework to conduct organizational process improvement using the Plan-Do-Study-Act (PDSA) cycle. The IHI Model was chosen due to its widespread use in the healthcare improvement realm, ability to iterate rapid testing of ideas, and preexisting familiarity with the model among Whole Health Clinic team members.

Specific Aims

The aim of this project was to select and integrate an evidence-based risk stratification tool into the EHR, elevate care team knowledge of population health and risk stratification principles, and to empower an integrative care team to review and address the needs of the highest risk ranked patients by May 2024. The intervention ran from February 15th, 2024, through May 16th, 2024.

Methods

Context

The Whole Health Clinic is a Federally Qualified Health Center (FQHC) in Clackamas County Oregon, population 422,537 residents (US Census, 2021). The Clinic serves approximately 6000 empaneled patients and sees a volume of approximately 320 patients each week. Sixty percent of patients served are at or below 50% of the federal poverty level. The payor mix is 71% Medicaid, 12% Medicare, 2% commercial insurance and 15% uninsured.

The clinic practices in a team-based care environment including two teams, each consisting of an MD and an FNP, two medical assistants, a panel manager, a referrals coordinator, and a registered nurse who delivers care management to patients with chronic health conditions. A clinical pharmacist and a behavioral health clinician divide their time between the teams. An office manager, two front desk workers, and a nursing supervisor support the clinic. Whole Health Clinic is a member of a larger health system comprised of four

primary care clinics, three dental clinics, four school based health centers, and a behavioral health clinic. A quality department consisting of QI analysts, data analysts, and five EHR specialists support the health system. The team for this QI initiative included two nurse practitioners, two physicians, four medical assistants, two panel managers, two referral coordinators, an EHR site specialist, a Registered Nurse, the clinic manager, and a QI analyst. A clinical pharmacist and Behavioral Health Clinician were ad hoc members of the implementation team.

Interventions

This Quality Improvement Project Initiative implemented a risk stratification program at Whole Health Clinic. PDSA cycle methodology was utilized to promote an iterative approach to program implementation, and each phase was adjusted as needed based on results of the previous PDSA cycle. Project members met weekly during the study phase to review progress, plan next steps, and gather feedback.

The first step to meet project goals was to review and select a valid risk stratification tool. The team selected the Risk of Hospital Admission or ED Visit Stratification (RHA/EDVS) risk tool due to its reassuring predictive value and ease of integration as it was already included in the EHR software (positive predictive value of 0.78 at a threshold of 0.9 and a C-statistic (AUC) ranging from 0.63 to 0.78) (Epic Systems Corporation, 2023).Once the tool was selected, members of the implementation team completed an anonymous pre-implementation survey delivered via Microsoft Forms to assess the team's knowledge about risk stratification programs, and perceptions about their purpose, usefulness, and legitimacy of risk stratification.

Next, the QI lead delivered a 30-minute PowerPoint training on population health and risk stratification during the monthly team meeting. Content included an overview of population health principles and risk stratification, details about how risk stratification is used to identify patients and to apportion care, and finally information about how risk stratification is required to meet the mission of the organization, earn full PCPCH accreditation for improved

reimbursement on value-based care agreements. During the educational session staff watched a demonstration about how to activate the RHA/EDVS tool and received 1:1 training from the EHR analyst and QI lead around how to review and interpret risk score values.

Initiative team members then generated a high-risk registry of patients which was reviewed at monthly team meetings throughout the initiative. This registry was utilized to brainstorm and implement strategies to mitigate risk based on the best evidence of implementing population health concepts and utilizing clinic resources. The first team-devised strategy to mitigate risk for high-risk patients included targeting the highest risk patients for EHR portal activation and engagement. This was the intention for PDSA cycle two (weeks four through eight). To support the intervention CMAs received training on how to activate a patient's my chart account during the rooming process. Weekly data collection about the number of patients enrolled demonstrated low MyChart activation rates and staff feedback indicated challenges with the workflow. To address this, the initiative team proposed an outreach initiative with a two-tiered approach beginning with an automated text message to invite identified patients in the high-risk category to activate their MyChart account. A second component of PDSA cycle two included outreach from staff to patients on the high risk registry by phone to offer appointments for their Medicare wellness visit.

In PDSA cycle three (weeks nine through twelve), the team developed and tested extended care team interventions for the high-risk registry of patients. After additional brainstorming sessions the team chose A) screening for social determinants of health (SDOH) and B) clinical pharmacist support for patients with polypharmacy. To perform SDOH screening the initiative team created a registry of patients who had not previously been screened for SDOH needs. Whole Health Clinic began screening patients annually for SDOH needs in the Fall of 2023, and therefore patients who did not have an office visit in the past year had not been screened. The initiative team developed a script and outreach staff who were trained to screen and use existing workflows to funnel patients who screened positive to behavioral health

consultants for care linkages. The initiative team developed a definition for polypharmacy of 10 or more current medications, applied this criterion to the high-risk registry, and then filtered the registry to identify patients who had not had a care touch with the clinical pharmacist in the past year. The initiative team then reviewed this roster with the clinical pharmacist and developed a workflow to perform chart reviews and offer medication consults.

PDSA cycle data collection and feedback loops identified educational deficits and training needs throughout the initiative which were addressed with additional power point educational sessions, one on one trainings, and question and answer sessions during monthly meetings. Finally, a post-test survey was administered to the project group to assess care team members' change in knowledge, trust in the risk stratification process, and to guide planning for sustainability of the risk score-driven population health program.

During each PDSA cycle the multidisciplinary team had both managerial support and technical support. An EHR systems analyst provided support to optimize EHR utilization to provide the scores to care teams, highlight best practice alerts, improve chart review functions. A quality improvement analyst assisted with workflow development and Feedback and sponsorship were provided by medical and nursing leadership gave full sponsorship and feedback for each cycle

Study of the Intervention

The study measured changes in staff members' knowledge of and confidence in risk stratification. The effect of change in knowledge and confidence was evaluated using pre/post scores on a modified Risk Stratification + Care Management Survey tool developed by Ross et al., (2017), a tool developed and validated to evaluate healthcare providers' experience with risk stratification implementation (Appendix B).To measure the impact of the implementation of the RHA/EDVS tool, the number of patients stratified were measured pre- and post-implementation, in January 2024 and in May 2024. Qualitative data was generated using survey pre-and post-

implementation questions about recommendations for improvement (Appendix C, post-test survey questions 8 and 9).

Measures

Three outcome measures guided project goals. The first outcome measure aimed to demonstrate improvement in staff knowledge of the risk stratification process. The goal was an increase in the number of staff who report increased comfort level with describing the clinic's risk stratification process as "somewhat" or "very" comfortable. The second outcome measure aimed to demonstrate improvement in team member confidence level that risk stratification scores predict what they are intended to predict. The goal was an increase in the number of staff who report they are "somewhat" or "very" confident that risk stratification programs predict with they are intended to predict. The third outcome measure aimed to demonstrate improvement in confidence level that risk stratification scores add value for patients. The goal was an increase in the number of staff who report they are "somewhat" or "very" confident that risk stratification programs add value. The final outcome measure was the number patients in the highest risk category who were enrolled in MyChart during the project period. Additional outcome measures generated by subsequent PDSA cycles measured the number of high-risk patients who received a Medicare Wellness Visit.

Process measures monitored the implementation of the project and included delivery of at least one educational session and record keeping of workflows developed by the initiative team. The goal was one educational session and one risk score workflow and was described by qualitative data generation through open ended questions on the posttest survey.

A balancing measure monitored for the unintended consequences possible from a new program implementation. The goal of the program was not to be perceived as an additional time requirement of staff.

Analysis

The data analysis plan includes qualitative and quantitative methods for analyzing results. Staff pre-post survey responses to the modified Ross tool were anonymously collected and unmatched using Microsoft Forms. Qualitative answers were manually coded to identify themes and summarize results. Pre and Post test scores were visually represented using bar graphs. MyChart Activation was tallied and tracked by type of workflow and displayed in table format.

Ethical Considerations

Ethical considerations for this project included confidential storage of data, maintaining anonymity of staff survey respondents, and consideration of implicit bias in risk stratification which relied on the team's subjective clinical judgement. Risk stratification tools are unable to conceptualize health disparities rooted in generations of structural racism and the unequal context in which risk score algorithms are applied (Nong and Adler-Milstein, 2021). Data integrity was maintained by using password protection on encrypted computers. This project was approved by the OHSU IRB review board on January 3rd, 2024.

Results

Results

Risk stratification tool implementation

627 patients were sorted into the high-risk category at a threshold of 40% one-year risk of hospitalization or ED utilization. Risk stratification implementation was accomplished by applying the RHA/EDVS) to the clinic population and establishing patient and population-level risk score workflows including scheduling, rooming, outreach, and visit workflows.

Outcomes

Results of the project are grouped into two main areas of focus: Risk stratification knowledge expansion and population health interventions to mitigate risk. 16 clinic staff members participated in the initiative program. Pre-intervention surveys (*n*=16) and post-intervention surveys (*n*=15) were collected. Process measure results tallying the number of

educational presentations provided to the initiative team, the number of workflows generated, and the number of high-risk rosters developed are summarized in Table 4.

Risk stratification knowledge expansion

Survey results from 15 team members demonstrated gains in knowledge of risk stratification by improvement in comfort level with describing the risk stratification process (Figure 1). Confidence levels changed from three staff to 11 staff reporting they are “somewhat” or “very” confident risk scores predict what they are intended to predict, (Figure 2). Improvement by the number of staff who report risk stratification programs add value to patients was modest, with six members rating themselves as somewhat or extremely confident applying risk stratified approaches to patient care adds value to patients at pre-intervention and seven staff members asserting this at post-intervention. Among the eight staff who responded to the balancing measure question, six rated the impact as not relevant or neutral. Two staff reported a negative impact on available time (Table 1). Additionally, a survey question asked staff whether they agree with the statement, “a risk stratification program will help reduce burnout among staff.” (Appendix C). Score on this question increased from the pre to post intervention period, with six staff members affirming risk stratification programs will help reduce burnout at pre-intervention and seven staff affirming risk stratification programs will help reduce burnout at post-intervention (Figure 4).

Qualitative data described nuanced information about staff perceptions of the initiative. In one question, staff were asked to describe what they found helpful about implementing risk stratification (Table 2). Several staff members expressed satisfaction with utilizing QI principles to guide the implementation and with group discussions. Other staff reported satisfaction with learning a new way to prioritize patient care (one staff member), increased ability to identify patients who are at increased risk of hospitalization or ED utilization (three staff members), and one staff offered further ideas about supports that may be useful to mitigate risk such as providing home visits. Several staff members expressed uncertainty about their role in the risk

stratification process, uncertainty about how to mitigate risk and uncertainty about the degree to which the risk stratification has been implemented (three staff).

A final open-ended question offered staff the opportunity to share feedback about what further steps could be undertaken to improve the risk stratification implementation process (Table 3). Staff suggested a need for more resources, staff, and training to better realize risk stratification's potential positive impact. Additionally, staff members expressed a need for additional staff to perform outreach (n=1), and for a population management nurse or CMA (n=1). Several staff members contributed ideas about integrating high risk patient outreach into pre-existing workflows for recalls and other outreach (n=2), as well as a need for additional data registries to identify high risk patients who need preventive care such as breast cancer screening, cervical cancer screening, colon cancer screening, and patients with uncontrolled chronic illness and tobacco dependence (n=1). Additional resources identified included housing support (n=1) and offering gift card to patients (n=1).

Figure 1

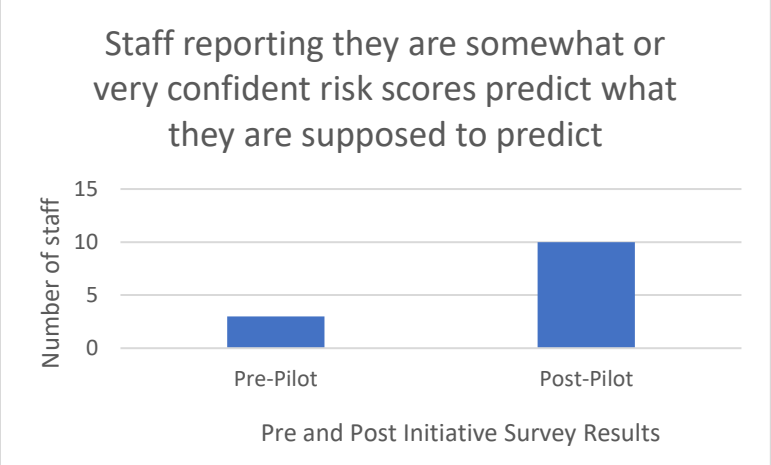

Figure 2

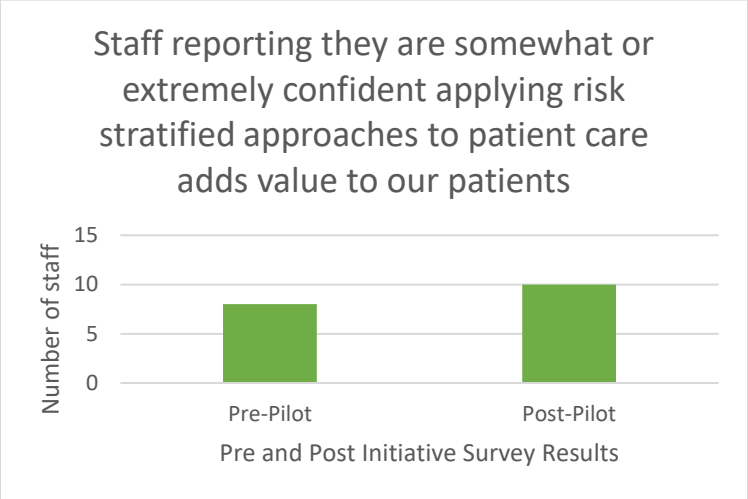

Figure 3

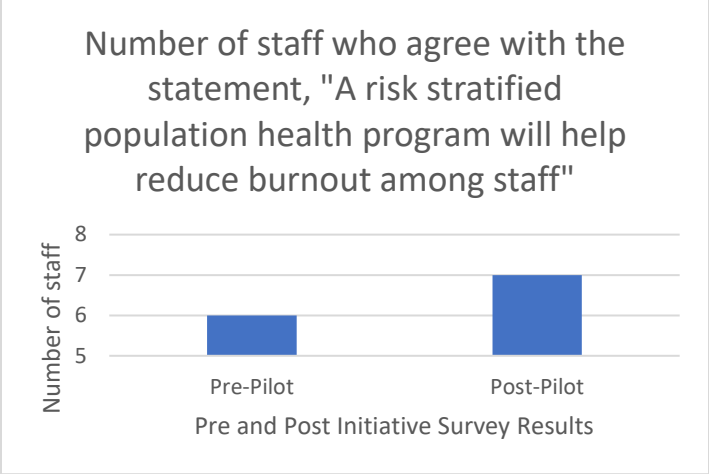

Figure 4

What, if anything, about your daily work have you had less time to do because of increased demands on your time to view and attend to risk stratification scores?	Negative, Neutral, NA or Positive Impact
Less patient encounter openings due to more patients having appointments for FlexFunds applications.	NA
n/a- this doesn't apply within my job role	NA
Reviewing risk stratification score doesn't add more work or time	Neutral
Currently, not enough staff time to implement outreach or dedicated efforts based upon the scores	Negative
Our workflows have not fully included risk stratification yet.	Neutral
NA	NA
Not much change	Neutral
Less time to answer emails, update staff schedules, send reports, and process documents.	Negative

Table 1

What has been most helpful in implementing risk stratification?
Prioritizing pts who are in most need of preventive care
Improved awareness of resources needed and ED utilization.
n/a- does not apply in my job role
Getting support from QI team to get list of patient panel
Discussing it in group, for now; Would be most helpful seeing how our efforts decrease their risk scores over time
I don't believe it's fully implemented yet
I think having case managers that can go to patient homes will help a lot.
To be honest I haven't noticed much change aside from just having the added list on my template that shows the patient's risk. It's helpful to see since I can better understand if they are more complicated/more at risk for hospitalization, but I still feel a little unsure of my actions to take/what is expected of me when patients have a high risk score.
It provides information and outreach that can reduce hospitalizations.

Table 2

What could we improve about implementing risk stratification?
Implement a means to add high risk pts needing follow up/outreach into CMA recalls- so they can outreach per an already built system that is functional and familiar (for example MWVs).
More resources to help support the needs like housing.
Combine lists/integrate with current outreach strategies already in place where possible
No assessment at this time
Probably have at least 1.0 FTE dedicated to outreach
We need a population management nurse or CMA to assist with doing this effectively. We also should have the ability to run specific reports on: - patients due for preventive services (mammogram, pap, colon cancer screening) - patients who have uncontrolled chronic illnesses (Diabetes, Hypertension) - patients who are tobacco users
Gift cards, even 10.00 might improve participation.
I would have to know more about the program in order to answer this question.

Table 3

Process measurement		
Process type	Description of process	Stage of occurrence
Presentation	Population health and risk stratification presentation, 30 minutes	At project initiation
Presentation	Risk stratification update presentation, 20 minutes	At week 12
Workflow	Risk tool workflow location – font desk	At project initiation
Workflow	Risk tool location – back office CMAs	At project initiation
Workflow	Risk tool location – providers	At project initiation
Registry	High risk registry	At project initiation
Data visualization	High risk roster added to Care Manager dashboard	At project initiation
Registry	Patient MyChart status for high risk patients	Week 1
Workflow	CMA enroll patients on high risk registry during visit rooming	Week 1
Registry	High risk patients due for Medicare Wellness Visit	Week 4
Data visualization	High risk patients due for Medicare Wellness Visits	Week 4
Registry	High risk patients with polypharmacy	Week 9
Registry	High risk patients due for SDOH screening	Week 9
Workflow	Outreach to patients for MyChart activation – CareMessage bulk texts	Week 5

Workflow	Outreach to patients who opt into receive phone call for MyChart activation support	Week 5
Workflow	CMAs schedule MWV visits for high risk patients	Week 4

Table 4

Population health interventions to mitigate risk

Initial steps of the intervention, modifications, and evolution over time are presented in a PDSA cycle format in Figure 5. Using PDSA cycle iterations, staff considered and initiated workflows to create care linkages (MyChart Activation and Medicare Wellness Visit scheduling for high risk patients) and to identify needs that could be addressed by extended care team members (polypharmacy and screening for social determinants of health (SDOH). CMA workflow development geared to increase MyChart activation yielded two enrollments, which led to workflow adjustments to send invitations via text. This too yielded two enrollments, although response to the text was robust. Results are summarized in Table 5. A similar effort to outreach to and schedule high risk patients due for Medicare Wellness Visits yielded 14 completed visits. Through the iterative PDSA cycle process and collaborative care team discussions, the initiative team ultimately generated a robust list of potential mitigations to address high risk, grouped into four categories – creating care linkages, supporting care transitions, care management support and SDOH support - and summarized in Figure 7.

Plan – CMAs trained to identify high-risk patients and offer MyChart Sign up at office visit
Do - Initiative runs weeks 1 – 3
Study - Few sign ups, CMAs report time constraints
Act - Initiative team recommends between-visit workflow
Plan - Develop workflow for two-tiered outreach
Do – During weeks 4 – 6, Bulk text message sent to high-risk patients, responses collected,
Study – good response to bulk text messages, scant response to personalized phone calls, difficulties with staffing to perform phone calls.
Act – Initiative team recommends a dedicate team to complete outreach
Plan – Weeks 7 -9, team initiatives triage of outreach for high risk patients due for Medicare Wellness Visits (MWV)
Do – Direct CMAs schedule MVW visits
Study – 14 visits completed
Act – continue CMA scheduling of high risk patients
Plan – Weeks 10 – 12, team develops additional interventions to identify and offer clinical pharmacist review for high risk patients with polypharmacy (10+ medications), and perform SDOH screening for patients on high risk registry not screened n the last 6 months.

Do – registries generated, staff identified to perform outreach
Study – staffing issues delay trial of new workflow
Act – Post Test completed

Figure 6

MyChart Activation for High-Risk Patients		
Initiative weeks	**Nature of intervention**	**Result**
Weeks 1 to 3	sign up during rooming	2 patients enrolled
Weeks 3 to 6	Bulk text messages sent	14% response rate
weeks 7 - 12	Affirmative responses receive phone calls	2 additional patients enrolled

Table 5

Possible Interventions to Mitigate Risk

Provide additional communication and care linkages

* Prioritize MyChart enrollment for highest risk patients
* Prioritize for Annual Wellness Visits

Provide additional support with care transitions

* Clinical Pharmacist med review (340B assessment if needed)

CMC Genoa review/outreach for med coordination

Offer resources for non-emergent medical transportation assistance

Provide additional care management support with chronic health conditions

Dental Navigator – referral for diabetes / dental needs

RN Case Management for HTN, diabetes

ref to DIP case mgmt.

BHC / MAT assessment & review – ref to Hilltop, etc.

Provide additional support with SDOH, etc.

* SDOH team outreach

OHP outreach – if under or no insurance in chart

CareOR - HRS case management if needed

Figure 7. Care team list of clinic-specific interventions to consider for high-risk mitigation. Asterix indicates mitigations initiated during the initiative period.

Discussion

Summary

The specific aims of this QI project were met by implementing the rsv/va tool into the EHR, improving care team knowledge about risk stratification concepts and confidence among team members in implementing a population health and risk stratification program, , and developing facility with care team-generated mitigation strategies for patients at high risk of ED

utilization and hospitalization. Key findings of the QI project affirm that adhering to evidence-based factors that support implementation of a risk stratification program support the successful launch of a risk stratification program in a clinic new to a population health model of care, as evidenced by growth in staff self-report of comfort with and confidence in risk stratification methods. Successful risk stratification implementation facilitates the Whole Health clinic to achieve PCPCH certification and participate in value-based payment contracts. Strengths of the project include leveraging pre-existing PDSA knowledge and QI infrastructure to build interest in and knowledge of risk stratification principles, as well as leveraging quality and electronic health record team resources to provide data and workflows to support the needs of the project.

Interpretation

Building the risk stratification initiative around key evidence-based implementation strategies, most specifically provider buy-in and adhering to QI principles, is an evidence-based way to implement a risk stratification program, as evidenced by positive change in the pre- and postintervention survey results. As the care team developed an interest in testing a particular mitigation strategy, registry or workflow, the quality team was able to develop the resources needed to put registries, data visualizations and workflows into the hands of staff who could perform interventions. Providers buy-in was solicited at each initiative meeting and provider guidance was sought as to where to locate risk scores in the EHR, how to apply the risk score to prioritize care, and which interventions to develop to mitigate risk. The iterative nature of PDSA cycles allowed for the QI Lead to identify continued knowledge gaps or uncertainty and address it as it arose. Qualitative data also supports the conclusion that changes in pre and posttest ratings of comfort with and confidence in risk stratification are related to the intervention. For example, staff spoke knowledgeably about the relationship between risk stratification, prioritization, and allocation of resources, developing an understanding of patient complexity and resources needed to mitigate risk and spoke positively of the group discussions which served as the backbone of the intervention. Results of this initiative are consistent with

findings from other publications that point to provider buy in, training for staff in population health principles, and adherence to QI principles as key factors contributing to the success of a risk stratification program implementation ((Nalin et al., 2016; Mora et al, 2017; Ross et al., 2020).

Limitations

Long term success of risk stratification programs that anticipate risk of hospitalization and ED utilization should be measured by reduction of actual hospitalization and ED utilization rates. Because of the duration of this QI improvement project, it was not feasible to evaluate improvement in these outcome metrics, nor was it a goal of the project. A limitation of the tool developed is that patients under age 18 were not included in tool validation, and therefore were not stratified in this initiative. The limited duration of the initiative did not allow conclusions to be drawn about the effectiveness of initiative interventions at reducing the rate at which patients at high risk of hospitalization or ED utilization are admitted to an acute care setting. Strategic trade-offs and opportunity costs of the initiative appear low based on staff report of time burden in the post-intervention survey. During the course of the initiative, care team members posed and provided feedback on several issues that due to time constraints were not able to be acted on, including concerns about locating patients who have signed up for but are not actively using MyChart, advocating to allow patients to schedule visits using MyChart, patients unable to access transportation services, patients calling to schedule hospital follow ups without being scheduled with the clinical pharmacist (not following standard hospital discharge follow up workflows), transition of care workflows not identified by standard Healthcare Information Exchange workflows, and better collaboration between insurance eligibility assisters and the care teams. While out of scope for this limited initiative, these discussions unearthed valuable insights and generated lively, engaged discussion. Thus, while not a focus of study for this initiative, it is reasonable to conclude that care team discussions centered on lowering risk for high-risk patients have far reaching benefits for improved patient care and care team

investment. However, because this initiative focused on high-risk patients it is not possible to draw conclusions about the generalizability of these findings to the patient population at large.

Conclusions

To support the triple aim, innovative ambulatory care centers have turned to population health management principles including risk stratification methods to provide better care amidst limited resources (Low, 2017). Implementing a risk stratification program can invigorate care team discussions about patient centered care. Participants deemed the initiative useful as evidenced by positive qualitative data findings at initiative conclusion. Utilizing a high-risk patient registry was an effective and collectively supported way to triage and prioritize a large volume of patients needing a Medicare wellness visit. More study is needed to ascertain the efficacy of a risk stratified approach to apportioning limited resources to serve the most vulnerable patients. Unconscious bias may impact subjective clinician assessment of patient risk scores, and new risks scores that consider patient equity or measure risk in different ways may result in better outcomes. Sustainability of a risk stratification program requires continued investment by leadership, training, and education as new staff and new priorities compete for care team attention.

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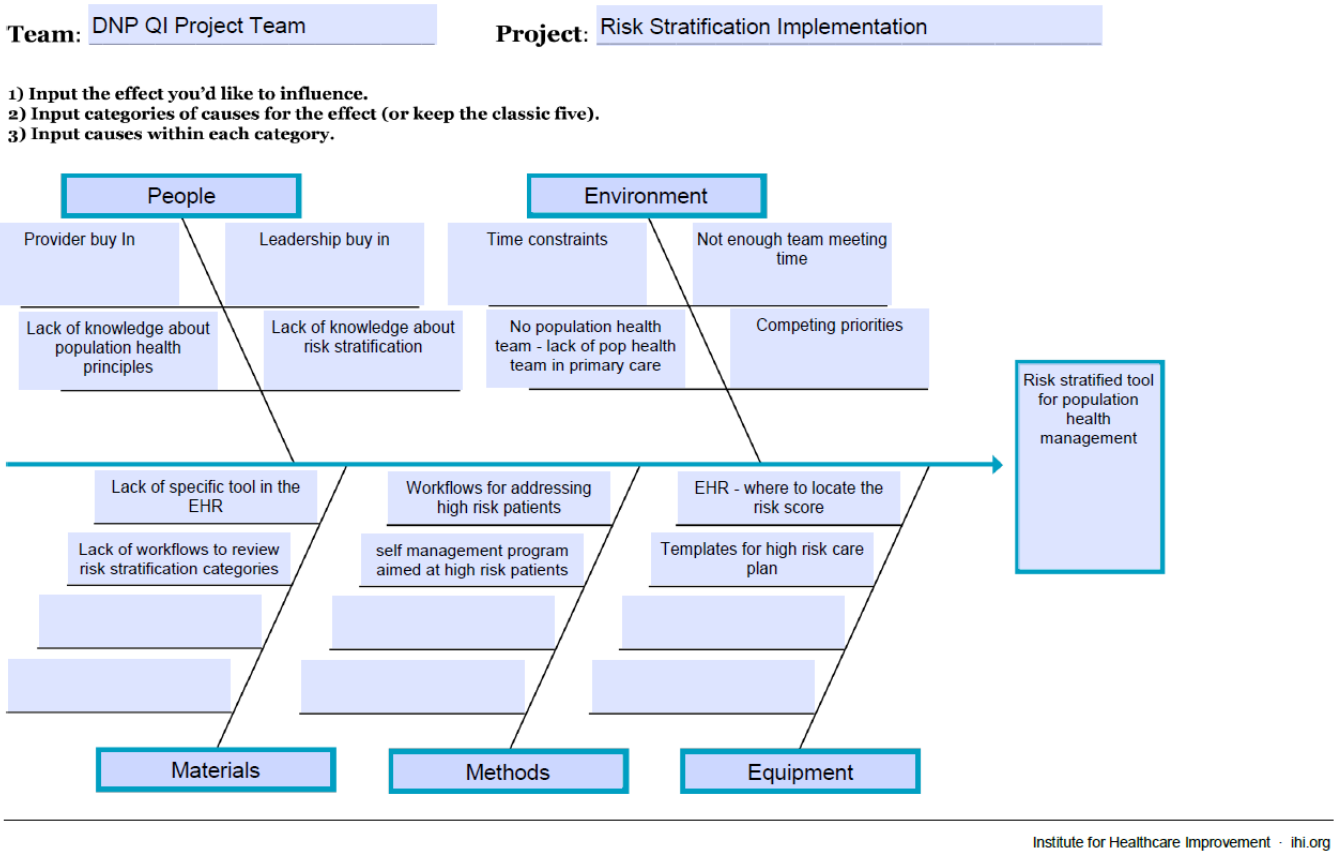
Appendix A

Risk Stratification Implementation Project

Project Timeline

	December 2023	January 2024	February 2024	March 2024	April 2024	May 2024	June 2024
Finalize project design and approach	X						
Complete IRB determination or approval	X						
PDSA Cycle 1		X					
PDSA Cycle 2			X				
PDSA Cycle 3				X			
Final data analysis					X		
Write sections 13-17 of final paper						X	
Prepare for project dissemination							X

Appendix B Root Cause Analysis



Appendix C

Risk Stratification Survey – Pre-Test
Clackamas Health Centers is redesigning how population health is organized and performed. Please answer the following questions to help us understand our organization's current level of readiness for population health programs. Your answers are anonymous.

1.Which best describes your role in the clinic?

Certified Medical Assistant

Registered Nurse

Provider

Front Desk Staff

Call Center Staff

Behavioral Health Clinician

Quality Team Member

Manager/Supervisor

2.What is the purpose of risk stratification (select all that apply)

To better understand the patients we serve

To direct resources toward the patients who most need them

To qualify for team based care certification standards

I don't know

3.What percent of your clinic's patients are currently risk stratified?

100%

More than 75% but less than 100%

More than 50% but less than 75%

More than 25% but less than 50%

Less than 25%

I don't know

4.How comfortable do you feel describing your clinic's risk stratification process?

Very comfortable

Somewhat comfortable

Neither comfortable nor uncomfortable

Somewhat uncomfortable

Very uncomfortable

5.How confident are you that in general, risk stratification scores predict what they are supposed to predict?

Extremely confident

Somewhat confident

Neutral

Somewhat not confident

Extremely not confident

6.How confident are you that applying risk stratified approaches to patient care adds value to our patients?

Extremely confident

Somewhat confident

Neutral

Somewhat not confident

Extremely not confident

7.Do you agree with this statement: A risk stratified population health program will help reduce burnout among staff

Yes

No

Maybe

8.What three things could our clinic do to help a population health program succeed at our clinic?

Risk Stratification Survey - Posttest

Clackamas Health Centers is redesigning how population health is organized and performed. Please answer the following questions to help us understand our organization's current level of readiness for population health programs. Your answers are anonymous.

1.Which best describes your role in the clinic?

Certified Medical Assistant

Registered Nurse

Provider

Front Desk Staff

Call Center Staff

Behavioral Health Clinician

Quality Team Member

Manager/Supervisor

2.What is the purpose of risk stratification (select all that apply)

To better understand the patients we serve

To direct resources toward the patients who most need them

To qualify for team based care certification standards

I don't know

3.What percent of your clinic's patients are currently risk stratified?

100%

More than 75% but less than 100%

More than 50% but less than 75%

More than 25% but less than 50%

Less than 25%

I don't know

4.How comfortable do you feel describing your clinic's risk stratification process?

Very comfortable

Somewhat comfortable

Neither comfortable nor uncomfortable

Somewhat uncomfortable

Very uncomfortable

5.How confident are you that in general, risk stratification scores predict what they are supposed to predict?

Extremely confident

Somewhat confident

Neutral

Somewhat not confident

Extremely not confident

6.How confident are you that applying risk stratified approaches to patient care adds value to our patients?

Extremely confident

Somewhat confident

Neutral

Somewhat not confident

Extremely not confident

7.Do you agree with this statement: A risk stratified population health program will help reduce burnout among staff

Yes

No

Maybe

8.What could we improve about implementing risk stratification

9.What has been most helpful in implementing risk stratification?

10. What, if anything, about your daily work have you had less time to do because of increased demands on your time to view and attend to risk stratification scores?

Appendix D

Letter of Support from Clinical Agency

Date: *1/08/2024*

Dear Preceptor,

This letter confirms that I, Andrew Suchocki, MD, MPH, allow Angela Amundson (OHSU Doctor of Nursing Practice Student) access to complete her DNP Final Project at our clinical site. The project will take place from approximately January 2024 to May 2024.

This letter summarizes the core elements of the project proposal, already reviewed by the DNP Project Preceptor and clinical liaison (if applicable):

- **Project Site(s)**:

  Clackamas Health Centers Sunnyside Clinic, 9775 SE Sunnyside Rd Suite 200, Clackamas, OR 97015

- **Project Plan:**

  - *Identified Clinical Problem:*

    Risk stratification in primary care is used by health systems and payers as a means to direct scarce healthcare resources to have the greatest impact and lower costs. Oregon's Patient Centered Primary Care Home (PCPCH) model rewards clinics who risk stratify their patients and conduct regular reviews of the risk scores by care team members. Clackamas Health Centers does not currently meet this PCPCH standard. PCPCH certification is a requirement of value-based payment contracts which Clackamas Health Centers participate in. The ultimate goal of risk stratification is to reduce overutilization of healthcare services by identifying patients who may benefit from additional services and providing or connecting patients to those services.

  - *Specific Aims*:

    The aim of this project is to equip Clackamas Health Centers Sunnyside Clinic to achieve Standard 5.A of the Patient Centered Primary Care Home Program by 1) initiating an evidence-based method to risk stratify its entire patient population utilizing the electronic health record to gather and display this information by February 2024; and 2) developing and testing a workflow for care teams to review, adjust and address highest risk patients by March 2024.

  - *Methods/Interventions/Measures:*

    The program will implement an evidence-based risk stratification tool for the entire patient population that consists of identifying patients at higher risk for developing poor health outcomes, analyzing, and actively monitoring risk stratification assignments, and proposing stratified care interventions to the highest risk patient group. The tool to be implemented is the Risk of Hospital Admission or ED Visit Stratification (RHA/EDVS) risk stratification model developed by Epic (Epic Systems Corporation, 2023). This tool is currently embedded in the clinic's EHR and was selected based on the positive predictive value of 0.78 at a threshold of 0.9 and a C-statistic (AUC) ranging from 0.63 to 0.78 and accessibility of the tool.

    The project will commence with administration of a pre-implementation survey anonymously to all participants to gain insight in the team's level of preparedness for risk stratification implementation. Next, the QI lead will deliver a PowerPoint training on risk stratification. Content will include information about the risk stratification tool, details about how risk

stratification can be used to apportion care interventions, and finally information about how risk stratification fits into the larger context of PCPCH accreditation and value-based payment.

The next phase of the initiative will consist of implementation of a risk stratification review and mitigation workflow. The team will 1) review a roster of patients in the highest risk category; 2) Implement one strategy to mitigate risk. The initial strategy selected is targeting the highest risk patient group for MyChart activation. This group will receive additional outreach to offer MyChart activation, including flagging these patients for MyChart sign up at every visit and targeted text-based MyChart activation offers. Iterative PDSA cycles will incorporate lessons learned as the teams review the risk score, become familiar with the workflow, and propose solutions to adjust and respond to highest risk patients. A post-test survey will be administered to assess care team members knowledge gain and trust in the risk stratification process and to guide planning for sustainability of the risk score-driven population health program.

- Site(s) Support

Site support includes EHR Systems Analyst time to support Risk Score builds as needed including developing a radar dashboard, building reporting workbench reports, and providing technical support for implementing the risk score tool. Clinic staff time will include filling out a 5 minute survey twice (pre and post), utilizing staff time in team meetings to review risk score rosters and make decisions about reclassification of patients into different levels of risk, staff time to review a power point presentation on risk stratification, the tool choice and its particulars including validation/reliability data and data which comprise the score including weighting, the program's relevance to the Patient Center Primary Care Home Accreditation process and best practice methods for addressing high risk patients. Site support also includes medical leadership sponsorship of the project and its relevance to organizational goals regarding population health and value-based care programs.

During the project implementation and evaluation, Angela Amundson will provide regular updates and communicate any necessary changes to the DNP Project Preceptor.

Our organization looks forward to working with this student to complete their DNP project. If we have any concerns related to this project, we will contact Angela Amundson and Sara Mitenbuler (student's DNP Project Chairperson).

Regards,

Andrew Suchocki, MD, MPH, FAAFP
Medical Director
Clackamas Health Centers