EMR Quality Dashboard Proof of Concept

Phase 2 Report

April 22, 2019

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1 Executive Summary

Introduction

Since 2004, OntarioMD has played a central role in facilitating the widespread adoption and use of OntarioMD-certified EMRs by Ontario clinicians. More than 17,000 community-based primary care clinicians now use OntarioMD-certified EMRs and related digital health products and services in their practice.

OntarioMD's mandate from the Ministry of Health and Long-Term Care (MOHLTC) and our organizational focus have shifted from EMR adoption toward providing the hands-on, knowledgeable support clinicians need to become more proficient users of health care technology for better patient outcomes. This means making sure physicians, nurse practitioners, other clinicians and practice staff are entering patient data into their EMR consistently so they can confidently use the information to monitor and care for patients. It also means optimizing EMR functionality and making sure new digital health technology integrates with EMRs enabling clinicians to be more efficient in their practice. By making EMRs more user-friendly, clinicians can streamline workflows, save time, and spend more with patients instead.

With this in mind, OntarioMD has led an EMR Quality Dashboard initiative to build an essential EMR-integrated practice tool that:

- provides immediate clinical value to clinicians, through real-time visual representation of EMR data using widely-recognized, primary care indicators;
- provides the ability to drill down to patient-level data for each indicator, enabling clinicians to take immediate proactive steps to improve patient care;
- helps clinicians standardize their data entry to improve the quality of patient data in their EMR;
- allows clinicians to trend and compare their indicator metrics with other clinicians using the Dashboard; and
- would scale provincially to all Ontario clinicians using an OntarioMD-certified EMR and is easily expanded with new and evolving data quality, practice and clinical indicators.

OntarioMD's work on this initiative was funded by the MOHLTC and conducted in partnership with Health Quality Ontario (HQO), the Association of Family Health Teams of Ontario (AFHTO), the Canadian Institute for Health Information (CIHI) and the Alliance for Healthier Communities (AHC), as well as EMR vendors TELUS Health and OSCAR EMR. We thank all participants and stakeholders for their invaluable support, insights and feedback on this important initiative.
During the initial Proof of Concept (PoC) phase, an EMR Quality Dashboard Framework was developed, and an introductory set of 17 health care clinical indicators were identified and developed. Phase 1 included the participation of 100 physicians for Dashboard use and testing.

Phase 2

Phase 2 started in September 2017 and concluded on March 31, 2019. Phase 2 focused on building on the lessons of Phase 1 to improve the EMR Quality Dashboard Framework, as well

as expanding the number of clinician participants to 500, enhancing the initial set of Dashboard indicators with additional indicators including opioid, and creating a business plan for provincial expansion.

Evaluations were conducted on Phase 2, both from qualitative and quantitative perspectives, based on several data sources including participant feedback, indicator results tracked over time, stakeholder interviews, and clinician user activity. The evaluation findings, which are summarized in this report, are being used to inform the broader provincial expansion of the Dashboard and further support improvements in clinician data quality and patient outcomes.

Key Themes and Findings

The work completed, and feedback received during Phase 1 clearly showed clinicians find value in a user-friendly Dashboard that integrates with their EMR and provides real-time visual representations of patient data. Phase 2 built upon these initial findings, outlined in the Phase 1 Benefits Evaluation and Final Report, to focus on improvement and expansion of the Dashboard and indicators, refine service adoption and support of the product, and demonstrate the impact of the Dashboard and OntarioMD's change management process on quality improvement at the practice level.

According to results from the Phase 2 participant survey conducted in December 2018, 65% of physician users were active, accessing the Dashboard at least once a month. Asked to list the most important benefits of their Dashboard use, respondents most often cited:

- identification of patients requiring follow-ups (64.29%);
- the ability to drill down on an indicator to access patient lists (58.93%); and
- acted as a prompt for the practice to update information to improve data quality (53.57%).

An assessment of aggregated Dashboard data shared by clinicians in Phase 2 bears this out, revealing the following clinician improvements in EMR data quality within 90 days after training:

- Patients with diabetes coded increased by 4.3%
- Patients with smoking status recorded increased by 3.2%
- Patients with colorectal cancer screening up-to-date increased by 2.9%
- Patients with hypertension coded increased by 2.8%
- Patients with BMI recorded increased by 2.8%
- Patients with breast cancer screening up-to-date increased by 2.3%

Clinicians within Family Health Teams (FHTs) had a higher rate of success than clinicians within other practice types in patient data capture and patient outcomes prior to training, but on average improved less than non-FHT clinicians.

Three types of training-support options were available during the PoC:

1. Vendor-delivered training without in-depth OntarioMD staff support;

2. OntarioMD-delivered training without follow-on, in-depth OntarioMD staff support; and
3. OntarioMD-delivered training with follow-on, in-depth OntarioMD staff support.

Based on assessment of indicator improvements, training-support option #3 (OntarioMD-delivered training followed by staff support) appeared to be the most effective in impacting improvements. During the training session, OntarioMD staff reported that many users, seeing the status of their EMR data quality for the first time, were surprised that their EMR data quality was not as expected. This proved to be a big motivator for many users who were eager to address data quality issues exposed during training sessions.

Dashboard and Indicators

Prior to the start of Phase 1, 17 indicators were selected for clinician use in the Dashboard, with six additional complementary indicators introduced by the end of Phase 1. During Phase 2, the number of indicators developed and released reached 30.

Findings from the overall process of managing enhancements and expansion during Phase 2 include:

- identification and formation of a clinical governance group is fundamental to provide clinical oversight throughout the indicator management lifecycle;
- ongoing clinical engagement is key in driving recommendations for enhancements and additional indicators; and
- management of new indicator development or enhancements by vendors was more complex and time-consuming than management of enhancements to EMR or Dashboard functionality by vendors.

Service Adoption and Support

Research conducted by OntarioMD and other health care organizations indicates that primary care clinicians are interested in new technology if it can improve work efficiencies, meet their practice goals and provide clinical value resulting in better patient outcomes. However, clinicians and their staff are limited in both time and resources. Adoption and support processes must make it easier for clinicians to use and quickly see results from any new technology.

With this in mind, OntarioMD staff were actively involved in Dashboard adoption and ongoing user support during Phase 2. Respondents to the Phase 2 participant survey indicated that support from OntarioMD staff was a key contributor in their increased use of the Dashboard, and 60% of respondents cited in-person engagement as the key to sustaining use of the Dashboard. Therefore, continued OntarioMD hands-on involvement in adoption and ongoing user support will likely result in higher adoption and effective use rates.

Complete Phase 2 findings and recommendations are presented in Section 5 of this report. The findings and recommendations will help to influence plans for province-wide delivery of the Dashboard.

Next Steps

During Phase 3, the project team will continue to expand and establish OntarioMD's quality measurement program and proceed with provincial deployment of the EMR Quality Dashboard - by allowing more clinicians to have access to the tool, by publishing an EMR Specification so that more EMR vendors can add this capability in their product offerings, and by making more quality indicators available on the Dashboard. Given the PoC Phase 2 findings that show OntarioMD staff support is essential to Dashboard adoption and sustained use, the program will also focus on scaling change management support to provide clinicians with quality improvement coaching and advisory services.

Under the program, support will continue to be led by OntarioMD staff. The engagement process, as follows, is designed to align with the Change Management Framework:

1. **Reach-out**
   The initial engagement of the potential user via email, phone call or in-person meeting to discuss potential participation
2. **Orientation**
   A scheduled meeting in person or over Skype to introduce the Dashboard to either an individual or group depending on the requestor's requirements
3. **Deployment**
   Involves the vendor's deployment of Dashboard functionality to the user's EMR instance
4. **Training**
   Training on the Dashboard may be provided by either the vendor or by the Practice Enhancement Consultants (PECs)
5. **Follow-up**
   After the user has had access to the Dashboard, OntarioMD staff schedule a session with the user to address barriers to use and help prioritize where improvements should be made

This change management approach was developed to ensure staff are well-prepared to deploy, and that users are supported to implement changes and sustain desired behaviour beyond the period that OntarioMD staff is actively supporting users. These engagements also establish the basis for potential longer-term practice support work that would require more commitment from clinicians, but lead to more impact on data quality and population health.

As the transformation towards integrated care delivery takes shape in Ontario, the EMR Quality Dashboard is well-positioned to provide Ontario Health Teams, the Ontario Health agency and the province with the platform to measure performance and quality improvement.

2 Phase 2 Scope and Objectives

Since 2015, OntarioMD has led a Proof of Concept (PoC) initiative with OSCAR EMR and TELUS Health to demonstrate the potential for improved clinical outcomes and practice efficiencies to Ontario clinicians through an EMR Quality Dashboard Framework. Clinicians across all 14 Local Health Integration Networks (LHINs) using one of the participating vendors' EMRs (OSCAR, PS Suite, MedAccess) were invited to take part in the initiative.

OntarioMD's EMR Quality Dashboard Framework:

- provides access to an introductory set of high-value provincial primary health care indicators centred on preventive care and chronic disease management;
- associates indicators with data quality improvement; and
- is provincially-scalable and expandable for new and evolving provincial indicators.

Phase 2 of the PoC focused on continuing the learning and demonstration of the EMR Quality Dashboard Framework started in Phase 1, as well as on business planning for the provincial expansion, including the establishment of a quality measurement program. Phase 2 ran from September 2017 to March 31, 2019.

Objectives for Phase 2 were:

- **Expand**
  - Expand participation from 100 clinicians in Phase 1 to 500 clinicians across the 14 LHINs
  - Demonstrate and assess scalability of key program components, such as recruitment, enrollment, training, support, change management strategy
- **Enhance**
  - Continue to identify and refine Dashboard clinical indicators, and optimize performance
- **Plan**
  - Develop a business plan to articulate the overall program roadmap and implementation plan to expand the Dashboard provincially
- **Evaluate**
  - Conduct both qualitative and quantitative evaluations of PoC Phase 2 against objectives
  - Prepare a final report to outline key findings and recommendations for provincial expansion of OntarioMD's EMR Quality Dashboard and the quality measurement program

The remaining sections of this document cover the approach taken to achieve these objectives, the key accomplishments, the main findings and recommendations for provincial expansion, and provide a high-level overview of the program roadmap beyond the PoC.

3 Approach

Over the one-and-a-half-year journey of Phase 2, 400 new users were added to the PoC. In preparation for deployment, OntarioMD's change management and communications teams worked closely with the project team to plan and sequence project activities with a focus on user adoption. The phase was structured based on the OntarioMD Change Management Framework, which focuses on clear, concise stakeholder engagement and employing tactics to foster adoption.

OntarioMD's Change Management Framework was designed to embed change management principles into the project lifecycle. The framework keeps users top of mind and encourages the tactical alignment of resources to support adoption.

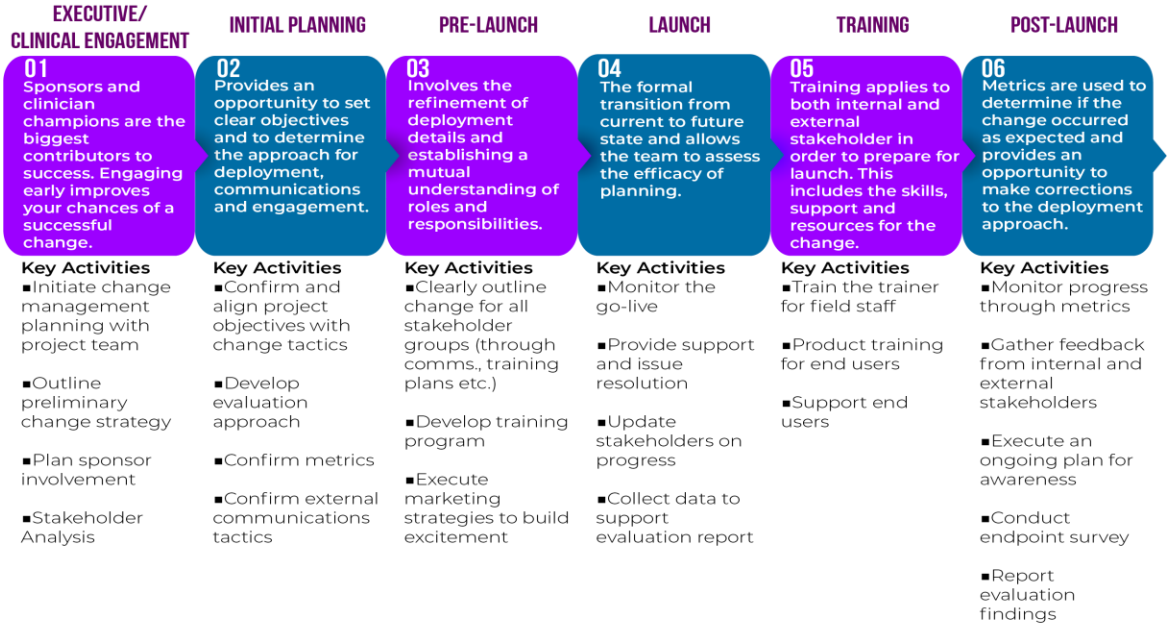


Figure 1 - OntarioMD Change Management Framework

The framework above reflects the change objectives of each phase and builds upon the existing project lifecycle. A slight modification to the order of phases presented above (launch occurring before training) was made to accommodate training activities that were conducted at the user's practice with their EMR data.

The early stages as per the OntarioMD change management framework (executive and clinical engagement and initial planning) involve level-setting and clearly outlining objectives. The stakeholder analysis and initial change impact assessments provided a starting point to begin planning stakeholder engagement tactics in preparation for the change. The stakeholder analysis conducted during Phase 2 identified users and OntarioMD Practice Enhancement Consultants (PECs) as the high-priority stakeholder groups that would require the most support and training as Phase 2 introduced the most change to their respective workflows. PECs

required training on the Dashboard and support on clinical adoption. Users required training and support to integrate the Dashboard into their clinical workflow.

Clear objectives were shared broadly amongst the stakeholder groups during pre-launch, and all groups that were impacted most were provided with clear direction on how to prepare and manage the change. OntarioMD PECs were engaged to support users through the deployment and user-facing staff were engaged frequently during go-live.

Post-launch, OntarioMD's change management team worked closely with the senior analytics advisor on the Dashboard project team to analyze Dashboard data to determine if users were performing as expected and if any users required immediate support. Preliminary findings from the Dashboard data on how users interacted with the Dashboard provided a starting point to perform deeper analysis into usage patterns.

The mapping of change-oriented principles within the project plan built change competencies within the team, and supported user adoption of the Dashboard. The change management team used data and learning collected during Phase 2 to inform recommendations for the remainder of Phase 2 and provincial deployment planning.

3.1 Change Management Approach

Phase 2 workstreams were designed to support user adoption, and to engage sponsors and other stakeholders in the initiative. This approach includes building an understanding of the full impact this change has on all identified stakeholders, and to engage appropriate resources to support users through Dashboard adoption and the associated workflow changes.

The approach was divided into the following phases, each with specific objectives and associated activities:

Defining the Change

This involves defining what is changing and what is not. In this instance, the change involves the deployment of a new product to EMR users. There are several downstream changes which must also be supported as a result of this initiative. Activities include identifying impacted stakeholder groups, the assessment of change, e.g., assessing the breadth of the impact of change by stakeholder groups, and determining project activities necessary to facilitate a successful initiative. This exercise served as a precursor to the planning, prioritization and sequencing of engagements.

Supporting the Change

After details were clearly defined for all stakeholders, the focus shifted to the resources needed to support the change, as per the objectives (expand, enhance, plan and evaluate). Training activities and supporting collateral were outlined to develop necessary Dashboard expertise among OntarioMD staff. Access to the EMR Lab – a virtual space for staff to interact with and understand various EMR offerings – allowed staff to interact with the Dashboard and prepare

for user engagements. Finally, data management and reporting requirements were defined to assess the efficacy of support efforts and determine if changes in support were required.

Monitoring the Change
Dashboard access allowed for the analysis of aggregate data to identify patterns of use and understand the impact of training and support. In addition, various data sources were consolidated and informed change management strategies and deployment details for broader provincial deployment. Evaluation efforts, including the endpoint survey, were undertaken to understand if users received the appropriate level of support and determine if they demonstrated the anticipated behaviour after go-live. Staff populated Feedback Logs throughout deployment, and these entries were monitored and coded to ensure staff and user needs were met.

Reinforcing the Change
Staff were provided with mechanisms to share their feedback throughout Phase 2. This was instrumental in allowing interventions to be proactively implemented throughout Phase 2 and were included in recommendations for subsequent phases. Providing staff and users with opportunities to provide feedback was also instrumental in establishing ownership of the change among these stakeholders and ensuring that the deployment approach reflected the needs of the stakeholders impacted. Ongoing analysis of the data will help staff identify potential issues and users who may require additional support.

The goal of the change management approach in Phase 2 was to engage staff beyond deployment activities. Use of this approach will continue in subsequent phases to ensure staff and users continue to receive the support they need.

3.2 Evaluation Approach

A variety of data sources and evaluation methods were leveraged to support Phase 2 work. These disparate data sources collected information from Dashboard users, OntarioMD staff and existing sources of OntarioMD clinician information. Analysis of these data sources informed a number of project activities, including this Final Report, development of an EMR Specification, indicator governance and management, and planning for provincial expansion of the EMR Quality Dashboard and quality improvement support services. The diagram below shows how the data sources and evaluation methods were used and how the evaluation outputs relate to one another.

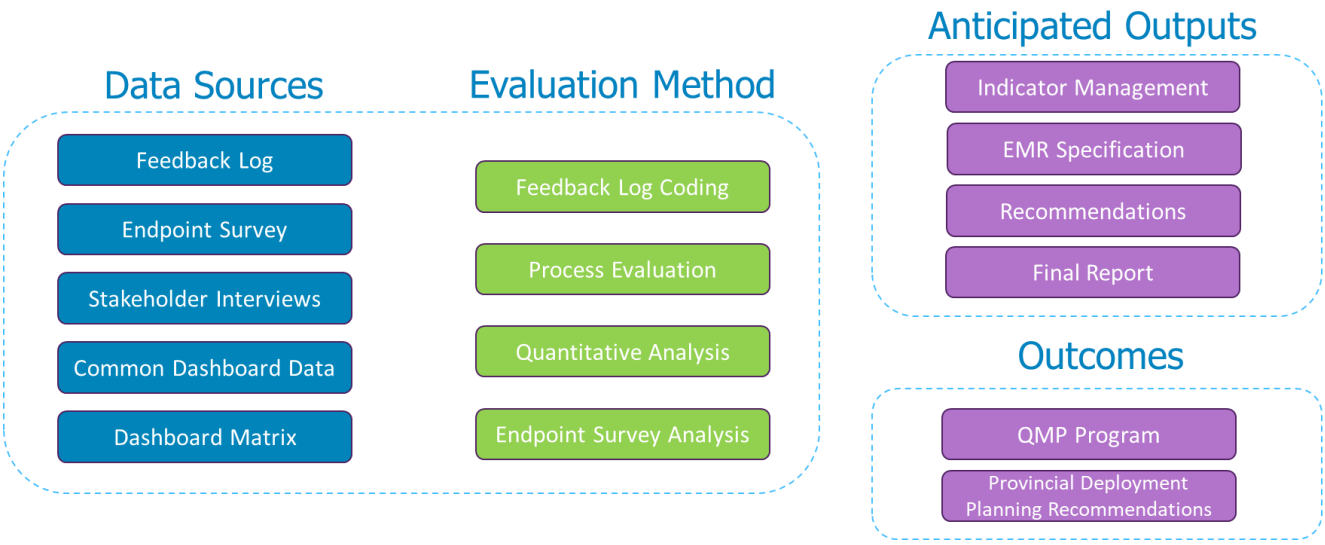


Figure 2 - Evaluation Approach

3.2.1 Data Sources and Limitations

- **Dashboard Matrix:** A spreadsheet into which OntarioMD staff entered information relating to clinician engagement, practice and clinician attributes, and the work effort associated with each clinician or user throughout the initiative.

  Limitation: This source was intended specifically for tracking accounts and their respective status during Dashboard engagements rather than a tool designed for systematic data collection; as such, it can be viewed as a program document.

- **Feedback Log:** A spreadsheet in which OntarioMD staff reported clinician feedback, their observations, and common concerns encountered during recruitment, onboarding, training, etc.

  Limitation: This Log did not capture the outcome of every engagement, but rather, any feedback passed on by clinicians as interpreted by OntarioMD staff. Thus, coding identified salient themes rather than accurate prevalence of issues.

- **Endpoint Survey:** A user-facing survey administered in December 2018.

  Limitation: The survey's response rate was just over 15%. However, it should be noted that: a) of the population that had access to the Dashboard during Phase 2, only users who completed training received the endpoint survey; and b) this is a relatively high response rate for OntarioMD clinician surveys. Findings citing the survey should clarify that this is only a sample of the Phase 2 user population.

- **Common Dashboard Data:** Exports of daily, real-time, aggregated Dashboard data for the purposes of analysis by OntarioMD.

  Limitation: Data provided by clinician participants who explicitly consented to share their metrics by turning on data sharing functionality within the Dashboard. Clinicians are incented to share data in order to access the ability to trend and compare their data with the aggregate of other participants. Based on analysis of the Dashboard data, some clinician participants did not turn on data sharing, while others did not turn on sharing until several days after training. Some participants were missing data indicators that were not enabled at their site due to performance limitations within their clinic's EMR.

- **Stakeholder Interviews:** Interviews with members of the EMR Practice Enhancement Program were conducted for the Process Evaluation (see Section 3.2.2). Interviews were transcribed and coded, and the results supplemented findings from other data sources.

  Limitation: Interviews captured the subjective views of OntarioMD staff and may therefore present bias.

3.2.2 Evaluation Methods and Limitations

- **Feedback Log Coding**: Entries in the Feedback Log were coded to identify prominent themes and patterns among issues raised during field staff engagement with clinics. We used an open coding approach: a naturalistic qualitative process of identifying patterns and themes to synthesize information that has not been structured in the form of its collection. Open coding can provide nuance to quantitative data sources (e.g., surveys), for example, articulating workflows that reveal a data entry problem, or practice management needs that may not have been accounted for in deployment. Following an inter-coder reliability check, two coders identified codes emerging from patterns across Log entries, adding new codes where existing ones did not fit. After coding the first 300 entries, the coding list was consolidated to 40 codes across nine issue categories.

  Limitation: Coding is always subject to coder bias, which we attempted to mitigate by employing two coders and conducting iterative reviews of coding results to control for interpretive variability. Also, as noted, the Log cannot be regarded as a systematically-collected source of data, and cannot be interpreted as representative of the concerns of the population of clinicians.

- **Process Evaluation**: A process evaluation of the PoC Phase 2 was undertaken in October 2018, designed and carried out in consultation with the project team, by the change management team. The process evaluation for the PoC Phase 2 investigated the following evaluation questions:
  - To what extent was Phase 2 implemented as intended?

- What factors might limit or facilitate effective adoption, training and utilization of the Dashboard?
- How effective was OntarioMD in planning resource utilization in Phase 2?

OntarioMD staff supporting Dashboard adoption and training with participating clinicians – specifically, the five PECs and the EMR Practice Enhancement Program (EPEP) manager – were interviewed. Interviews were scheduled for a full hour (some were shorter, some longer), and were subsequently transcribed and coded using Atlas.ti qualitative analysis software. Coding reports were generated and reviewed by the project team. Themes were identified for a deeper dive, and a focus group with the entire EPEP team was held to give PECs the chance to elaborate on their interviews. A final evaluation report was generated to report fully on the method, data collection, analysis and findings.

Limitation: The evaluation method involved interviews with the EPEP team, who routinely consult with each other on process issues. Responses from these staff members represent their cumulative experience of working with 500 PoC participants, and they should be considered "elite" interviewees offering subject matter expertise on common concerns.

- **Endpoint Survey Analysis:** This survey was designed by the project team in consultation with change management and communications. It ran for a period of two weeks and had a response rate of 15%.

  Limitation: Self-reported surveys are subject to respondent biases such as skewed perception of one's own abilities, the impact of mood, most recent experience on subjective satisfaction ratings, and a desire to appear cooperative.

- **Quantitative Analysis:** Dashboard data was merged with the Dashboard matrix. This was of interest as it allows us to understand the effect of change management support in the field, which in turn can lead to process refinements (e.g., to target practices with the appropriate intensity of support so they may achieve optimal value from the Dashboard). We compared the impact of three different models of training/support provided to clinicians on changes in Dashboard data, and stratified training/support impact across clinicians practicing within a FHT model and those within any other practice model. Change was assessed by comparing clinician data prior to the provision of training with clinician data 90 days after training (**pre-post analysis**). Methods for assessing statistical significance were based on a pre-post analysis of indicators recategorized into ***successful*** and ***unsuccessful*** outcomes (Appendix 7.2 explains how each indicator is recategorized). Pre-post analyses are compared across practice type and training support type and significance testing is performed using the Breslow-Day test for homogeneity of odds rations over multiway 2x2 contingency tables representing pre-post analyses applied of different practice types or training/support models.

Significance tests were also conducted using non-parametric tests of changes in pre-post success counts applied over practice types and training/support models.

Limitation: Quantitative analysis was constrained by the availability of data shared by participants, and by the availability of reliable clinician or practice information captured in the Data Matrix. Analysis was limited to data captured through the end of November 2018, so clinicians not trained on the Dashboard until after that date were not represented in the analysis. The analysis excluded information from the Patient Status indicator due to an error detected with the implementation of this indicator in the Common Dashboard. Pre-post analysis of indicator results is limited in assessing the impact of training without access to data on additional factors that could influence results, such as baseline performance and other concurrent quality improvement (QI) initiatives or activities.

The entire suite of evaluation methods was selected to control for bias in each individual method, so that each set of results complements the other to provide a more comprehensive picture in terms of quantified data quality improvement, clinician perspective on value and use, and PEC perspective on processes, barriers and facilitators.

4 Accomplishments

OntarioMD successfully completed EMR Quality Dashboard PoC Phase 2 by building on the solid foundation and learning from Phase 1. This section summarizes key accomplishments that align with the Phase 2 objectives of "Expand, Enhance and Evaluate" as set out in Section 2 of this report.

The remaining objective of "Plan", i.e., development of a provincial expansion plan, is contained in a separate business case document. Section 6 of this report summarizes this business case by providing an overview of the roadmap beyond the PoC and outlining key Phase 3 activities for the provincial expansion of the EMR Quality Dashboard.

4.1 Dashboard Adoption and Use

4.1.1 Dashboard Adoption and Change Management Support

Phase 2 achieved the "Expand" objective by increasing the Dashboard user base from 100 in Phase 1 to nearly 500 users. Approximately 1,000 clinicians were engaged to participate in Phase 2, and about 50% of those targeted clinicians agreed to participate.

OntarioMD PECs played an important role during Phase 2. The team drew on their expertise and track record of success working within OntarioMD's EMR Practice Enhancement Program (EPEP) to serve as the main liaison with clinician participants during the onboarding process. PECs also delivered the majority of Dashboard user training, with the balance handled by EMR vendors. PECs also conducted follow-up visits with clinicians, supporting them in implementing Dashboard-driven corrective measures, and assisting users in addressing data quality through OntarioMD's change management process.

Results of a participant survey conducted at the end of Phase 2 reinforce the importance of PEC support: 79% indicated that the training they received during the launch stage was sufficient to begin using the Dashboard, and 57% cited in-person engagements with PECs as an important component in their sustained use of the Dashboard.

PECs engaged and supported users beyond training, as of the end of the PoC, 84% of Phase 2 users received follow-up visits:

- 53% of users in Phase 2 received post-training follow-up sessions to address questions relative to training and discuss quality improvement opportunities.
- 31% of users in Phase 2 participated in-depth EPEP engagements during which OntarioMD staff and users developed strategies to implement corrective measures to address EMR data quality issues.

4.1.2 Frequency of Access and User Types

The Endpoint Survey asked respondents to indicate the frequency of access that best describes their use of the Dashboard during Phase 2. Table 1 summarizes responses to this question.

Table 1 - Frequency of Access and User Types

	Daily	Weekly	Monthly	Sum of Active Users	Did Not Regularly Access	N/A
Physicians	19.64% 11	17.86% 10	26.79% 15	64.29% 36	32.14% 18	3.57% 2
Admin staff	12.50% 7	3.57% 2	14.29% 8	30.36% 17	39.29% 22	30.36% 17
Clinic Manager/ Executive	8.93% 5	3.57% 2	5.36% 3	17.86% 10	42.86% 24	39.29% 22
IT Staff	1.79% 1	5.36% 3	5.36% 3	12.51% 7	30.36% 17	57.14% 32
Nurse	7.14% 4	1.79% 1	1.79% 1	10.72% 6	44.64% 25	44.64% 25
QIDSS	3.57% 2	1.79% 1	3.57% 2	8.93% 5	30.36% 17	60.71% 34
Nurse Practitioner	1.79% 1	0.00% 0	0.00% 0	1.79% 1	19.64% 11	78.57% 44

Physicians are the primary focus with respect to targeted users. However, these survey results confirm that the Dashboard is being used by other staff members within a practice.

4.1.3 Improvement in Clinical Indicator Metrics

The Endpoint Survey polled respondents on what data quality improvement measures they employed during the Dashboard PoC:

Table 2 - Data Quality Improvement Measures Implemented by Survey Respondents

Improvement Measures	%	#
I dedicated time to address data quality in my EMR	51.79	29
I updated information to address data quality as patients were seen	67.86	38
I have dedicated resources to address my data quality needs on an ongoing basis	30.36	17
I made use of OntarioMD Practice Enhancement Consultant engagements	21.43	12
I made use of follow-up feedback and support sessions with OntarioMD and/or vendor	21.43	12
I did not implement any data quality measures	14.29	8
Other	14.29	8

In addition to the Endpoint Survey results, aggregated Dashboard indicator metrics collected during the PoC also confirmed that Dashboard enabled data quality improvements – improvements in indicator metrics (e.g., % of patients identified as diabetic increased after 90 days of use) were observed for 13 of 15 indicators selected.

Sub-sections 4.1.3.1 through 4.1.3.6 provide additional statistics demonstrating Dashboard use and improvements in indicator metrics.

4.1.3.1 Indicator Profile

- 30 indicators were deployed during Phase 2:
  - six indicators provide insight into the quality of patient data captured in the EMR; and
  - 24 indicators provide insight into patient outcomes.
- 15 of 30 indicators were selected for the Phase 2 evaluation to assess improvements in data quality and patient outcomes;
- Each indicator has been transformed and relabeled to represent successful and unsuccessful outcomes (see Appendix 7.2);
- All subsequent references to indicators within the assessment refer to the transformed, relabeled indicators.

4.1.3.2 Clinician Profile

- 216 clinician participants began sharing data for at least one indicator before December 2018;
- 90 of these clinicians belong to FHTs; 126 belong to another practice type;
- 76 of 216 were trained by the vendor and received no in-depth OntarioMD staff support;
- 77 of 216 were trained by OntarioMD staff and received no in-depth support;
- 63 of 216 were trained by OntarioMD staff and received in-depth support;
- For each of the 15 indicators, results for at least 107 clinicians were available for assessment.

4.1.3.3 Assessment of Indicator Improvement

- Improvement was assessed by measuring differences in indicator outcomes between the date clinicians in Phase 2 were trained on Dashboard use, compared to 90 days after the training date;
- Clinicians were included in the assessment of an individual indicator if they were able to share and submit indicator data for at least 90 days after training up until November 30, 2018 (the cutoff date for inclusion of indicator results for analysis);
- Improvements were stratified by practice model: clinician participants who practice within a FHT, and those who practice within any other clinic model. Data exploration revealed distinct differences in the two populations, so further analysis was carried out separately within each population;

- Improvements were compared within each practice type between clinicians who were provided with three types of training/support in Phase 2:
    - Vendor training with no follow-on OntarioMD staff support
    - OntarioMD training with no follow-on OntarioMD staff support
    - OntarioMD training with follow-on OntarioMD staff support

4.1.3.4 Overall Indicator Improvements

Overall improvements (measured by percentage of patient success outcomes) were observed for 13 of the 15 indicators analyzed. Figure 3 shows improvements observed for each indicator.

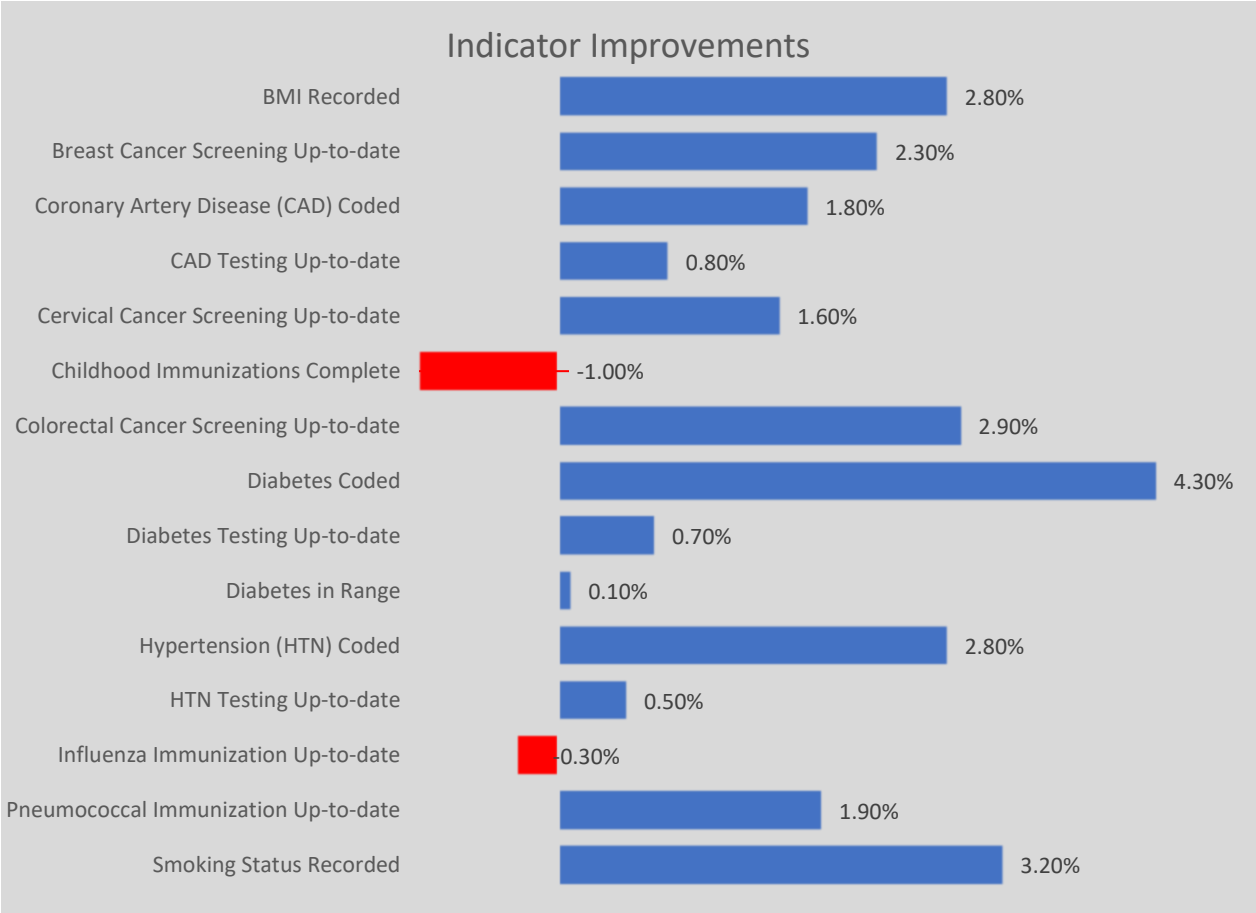


Figure 3 - Indicator Improvements Pre-Post Analysis

Certain limitations should be noted in the indicator metric analysis:

- The process evaluation conducted for Phase 2 revealed that practices used the Dashboard to identify patients who are no longer clients, resulting in reassigning patient status in the EMR from Active to Inactive, Deceased, or other status. This impacted the count of active patients, and subsequently, patient outcome counts across all 15 indicators.

- Improvements in patient diagnosis coding for Diabetes, Coronary Artery Disease (CAD), and Hypertension (HTN) impacted the count of active patients with confirmed diagnoses coding. This, in turn, impacted patient outcome counts for Diabetes Testing, Diabetes in Range, CAD Testing, and HTN Testing indicators.
- There are limitations in the ability to demonstrate improvement over 90 days with some indicators because of how these indicators are constructed:
    - Diabetes in Range is based on a clinical outcome (most recent HbA1c reading for a patient with diabetes), which is less likely to change over a short time period, even with proper clinical follow-up or intervention.
    - Childhood Immunizations Complete is based on children 30 to 42 months of age. Routine immunizations are given to children before the age of 30 months, so after 30 months, it is impossible to show patient improvements.
    - Influenza Immunization Up-to-Date is based on adults 65 years and older receiving a flu shot during the flu season (October through January). This indicator reflects seasonal activity, and improvements observed will depend on the time of year.
- It is difficult to draw conclusions about overall improvements observed without access to more information, such as:
    - data on other initiatives or clinical activity that can impact observed improvements;
    - data on clinician use of the Dashboard and other EMR functionality, so that improvements can be measured against Dashboard use and supporting functionality in the EMR; and
    - comparable indicator results generated from a control group of clinicians who do not have access to Dashboard functionality, so that the impact of access to the Dashboard itself can be measured.

4.1.3.5 Differences in Indicator Improvements Across Practice Type and Training Support Arrangements

As outlined in Section 4.1.3.3, participants belonging to various practice types received one of three types of training support arrangements in Phase 2 of the Dashboard PoC: Vendor training without follow-on OntarioMD support (Vendor), OntarioMD training without follow-on support (OMD), and OntarioMD training with follow-on in-depth support (PEC). Participants are also identified as belonging to either a Family Health Team (FHT) practice model, or any other practice model (Non FHT). Participant improvements over indicators are impacted by a combination of training support arrangement and practice type.

Expanding on the overall indicator improvements depicted in Figure 3, tables below (Tables 3, 4 and 5) summarize counts of successful and unsuccessful patient outcomes for 12 of the 15 indicators (excluding Childhood Immunizations Complete, Influenza Immunization Up-to-Date and Diabetes in Range). Counts of clinician participants contributing patient outcome counts are displayed as well. Patient outcome counts, success percentages, and participant counts pre-

and post-training are broken down by practice type and training support arrangement provided to participants.

Table 3 - Clinician participants and patient counts across indicators by practice type and training support arrangement

		Pre-Training Patient Outcomes			Post-Training Patient Outcomes			Pre-Post Changes	
	Clinicians	Successful	Unsuccessful	%	Successful	Unsuccessful	%	Patient Successful Outcomes	Patient Unsuccessful Outcomes
BMI Recorded	**155**	**123462**	**115870**	**51.6%**	**125941**	**105702**	**54.4%**	**2479**	**-10168**
FHT	**67**	**48636**	**39274**	**55.3%**	**49580**	**38110**	**56.5%**	**944**	**-1164**
OMD	28	23699	27546	46.2%	24087	26587	47.5%	388	-959
PEC	11	8356	4762	63.7%	8723	4545	65.7%	367	-217
Vend	28	16581	6966	70.4%	16770	6978	70.6%	189	12
NonFHT	**88**	**74826**	**76596**	**49.4%**	**76361**	**67592**	**53.0%**	**1535**	**-9004**
OMD	21	18279	22387	44.9%	18498	18619	49.8%	219	-3768
PEC	45	38479	34136	53.0%	39806	31088	56.1%	1327	-3048
Vend	22	18068	20073	47.4%	18057	17885	50.2%	-11	-2188
Breast Cancer Screening	**132**	**22320**	**25971**	**46.2%**	**23050**	**24438**	**48.5%**	**730**	**-1533**
FHT	**60**	**10531**	**8917**	**54.1%**	**10798**	**8828**	**55.0%**	**267**	**-89**
OMD	25	6028	6371	48.6%	6201	6298	49.6%	173	-73
PEC	11	1667	1112	60.0%	1713	1101	60.9%	46	-11
Vend	24	2836	1434	66.4%	2884	1429	66.9%	48	-5
NonFHT	**72**	**11789**	**17054**	**40.9%**	**12252**	**15610**	**44.0%**	**463**	**-1444**
OMD	17	3010	6292	32.4%	3022	5944	33.7%	12	-348
PEC	39	7039	6318	52.7%	7406	5785	56.1%	367	-533
Vend	16	1740	4444	28.1%	1824	3881	32.0%	84	-563
CAD Coded	**140**	**3801**	**9400**	**28.8%**	**4073**	**9247**	**30.6%**	**272**	**-153**
FHT	**63**	**1870**	**2101**	**47.1%**	**1989**	**2074**	**49.0%**	**119**	**-27**
OMD	26	1213	825	59.5%	1288	799	61.7%	75	-26
PEC	11	286	589	32.7%	298	580	33.9%	12	-9
Vend	26	371	687	35.1%	403	695	36.7%	32	8
NonFHT	**77**	**1931**	**7299**	**20.9%**	**2084**	**7173**	**22.5%**	**153**	**-126**
OMD	16	719	1634	30.6%	748	1650	31.2%	29	16
PEC	43	525	4790	9.9%	643	4638	12.2%	118	-152
Vend	18	687	875	44.0%	693	885	43.9%	6	10
CAD Testing	**107**	**1147**	**2745**	**29.5%**	**1236**	**2837**	**30.3%**	**89**	**92**
FHT	**59**	**468**	**1403**	**25.0%**	**532**	**1457**	**26.7%**	**64**	**54**
OMD	25	276	937	22.8%	302	986	23.4%	26	49
PEC	10	132	154	46.2%	147	151	49.3%	15	-3
Vend	24	60	312	16.1%	83	320	20.6%	23	8
NonFHT	**48**	**679**	**1342**	**33.6%**	**704**	**1380**	**33.8%**	**25**	**38**
OMD	12	250	476	34.4%	243	505	32.5%	-7	29

PEC	21	196	412	32.2%	225	418	35.0%	29	6
Vend	15	233	454	33.9%	236	457	34.1%	3	3

Table 4 - Clinician participants and patient counts across indicators by practice type and training support arrangement (part 2)

		Pre-Training Patient Outcomes			Post-Training Patient Outcomes			Pre-Post Changes	
	Clinicians	Successful	Unsuccessful	%	Successful	Unsuccessful	%	Patient Successful Outcomes	Patient Unsuccessful Outcomes
Cervical Cancer Screening	**129**	**40927**	**49197**	**45.4%**	**40208**	**45308**	**47.0%**	**-719**	**-3889**
FHT	**60**	**19886**	**15359**	**56.4%**	**18988**	**14685**	**56.4%**	**-898**	**-674**
OMD	25	11184	11188	50.0%	10091	10654	48.6%	-1093	-534
PEC	11	2870	1605	64.1%	3006	1477	67.1%	136	-128
Vend	24	5832	2566	69.4%	5891	2554	69.8%	59	-12
NonFHT	**69**	**21041**	**33838**	**38.3%**	**21220**	**30623**	**40.9%**	**179**	**-3215**
OMD	14	5330	11816	31.1%	5013	10278	32.8%	-317	-1538
PEC	39	12111	12618	49.0%	12515	11949	51.2%	404	-669
Vend	16	3600	9404	27.7%	3692	8396	30.5%	92	-1008
Colorectal Cancer Screening	**139**	**41527**	**51224**	**44.8%**	**42610**	**47269**	**47.4%**	**1083**	**-3955**
FHT	**64**	**19067**	**16332**	**53.9%**	**19447**	**15818**	**55.1%**	**380**	**-514**
OMD	26	9708	11113	46.6%	9838	10730	47.8%	130	-383
PEC	11	3323	2223	59.9%	3430	2181	61.1%	107	-42
Vend	27	6036	2996	66.8%	6179	2907	68.0%	143	-89
NonFHT	**75**	**22460**	**34892**	**39.2%**	**23163**	**31451**	**42.4%**	**703**	**-3441**
OMD	13	3887	10848	26.4%	3868	9796	28.3%	-19	-1052
PEC	41	14672	14933	49.6%	15129	13482	52.9%	457	-1451
Vend	21	3901	9111	30.0%	4166	8173	33.8%	265	-938
Diabetes Coded	**141**	**17832**	**6750**	**72.5%**	**19385**	**5853**	**76.8%**	**1553**	**-897**
FHT	**63**	**9488**	**1096**	**89.6%**	**9736**	**986**	**90.8%**	**248**	**-110**
OMD	26	4939	607	89.1%	5052	579	89.7%	113	-28
PEC	10	1322	299	81.6%	1400	239	85.4%	78	-60
Vend	27	3227	190	94.4%	3284	168	95.1%	57	-22
NonFHT	**78**	**8344**	**5654**	**59.6%**	**9649**	**4867**	**66.5%**	**1305**	**-787**
OMD	16	2653	921	74.2%	2819	907	75.7%	166	-14
PEC	43	3983	3879	50.7%	5120	3135	62.0%	1137	-744
Vend	19	1708	854	66.7%	1710	825	67.5%	2	-29
Diabetes Testing	**141**	**11588**	**4414**	**72.4%**	**12773**	**4696**	**73.1%**	**1185**	**282**
FHT	**64**	**6036**	**2232**	**73.0%**	**6168**	**2355**	**72.4%**	**132**	**123**
OMD	26	3115	1264	71.1%	3156	1487	68.0%	41	223
PEC	11	853	427	66.6%	913	436	67.7%	60	9
Vend	27	2068	541	79.3%	2099	432	82.9%	31	-109
NonFHT	**77**	**5552**	**2182**	**71.8%**	**6605**	**2341**	**73.8%**	**1053**	**159**
OMD	17	2022	635	76.1%	2096	674	75.7%	74	39

PEC	41	2602	865	75.1%	3501	1056	76.8%	899	191
Vend	19	928	682	57.6%	1008	611	62.3%	80	-71

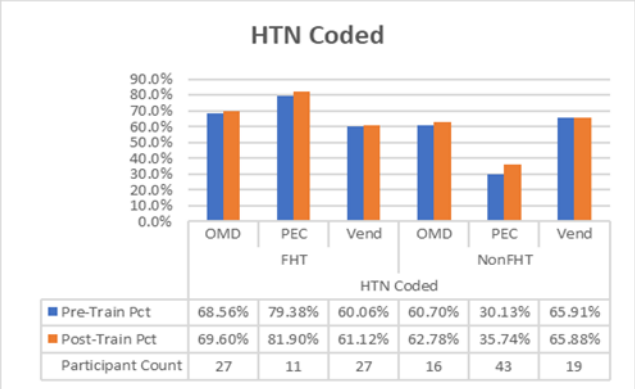
Table 5 - Clinician participants and patient counts across indicators by practice type and training support arrangement (part 3)

		Pre-Training Patient Outcomes			Post-Training Patient Outcomes			Pre-Post Changes	
	Clinicians	Successful	Unsuccessful	%	Successful	Unsuccessful	%	Patient Successful Outcomes	Patient Unsuccessful Outcomes
HTN Coded	**143**	**24803**	**22323**	**52.6%**	**26538**	**21375**	**55.4%**	**1735**	**-948**
FHT	**65**	**12790**	**5943**	**68.3%**	**13139**	**5763**	**69.5%**	**349**	**-180**
OMD	27	7138	3273	68.6%	7222	3154	69.6%	84	-119
PEC	11	2687	698	79.4%	2782	615	81.9%	95	-83
Vend	27	2965	1972	60.1%	3135	1994	61.1%	170	22
NonFHT	**78**	**12013**	**16380**	**42.3%**	**13399**	**15612**	**46.2%**	**1386**	**-768**
OMD	16	3526	2283	60.7%	3758	2228	62.8%	232	-55
PEC	43	5389	12495	30.1%	6557	11787	35.7%	1168	-708
Vend	19	3098	1602	65.9%	3084	1597	65.9%	-14	-5
HTN Testing	**131**	**21594**	**3641**	**85.6%**	**22844**	**3694**	**86.1%**	**1250**	**53**
FHT	**64**	**11141**	**1650**	**87.1%**	**11452**	**1687**	**87.2%**	**311**	**37**
OMD	27	6210	928	87.0%	6272	950	86.8%	62	22
PEC	10	2256	432	83.9%	2360	422	84.8%	104	-10
Vend	27	2675	290	90.2%	2820	315	90.0%	145	25
NonFHT	**67**	**10453**	**1991**	**84.0%**	**11392**	**2007**	**85.0%**	**939**	**16**
OMD	14	3108	418	88.1%	3268	490	87.0%	160	72
PEC	35	4975	845	85.5%	5714	843	87.1%	739	-2
Vend	18	2370	728	76.5%	2410	674	78.1%	40	-54
Pneumococcal Imm	**143**	**24176**	**40926**	**37.1%**	**24539**	**38372**	**39.0%**	**363**	**-2554**
FHT	**64**	**10439**	**11963**	**46.6%**	**10345**	**12227**	**45.8%**	**-94**	**264**
OMD	26	5674	8517	40.0%	5598	8500	39.7%	-76	-17
PEC	11	1949	1675	53.8%	1976	1684	54.0%	27	9
Vend	27	2816	1771	61.4%	2771	2043	57.6%	-45	272
NonFHT	**79**	**13737**	**28963**	**32.2%**	**14194**	**26145**	**35.2%**	**457**	**-2818**
OMD	17	2276	8914	20.3%	2250	7880	22.2%	-26	-1034
PEC	41	9143	13126	41.1%	9591	12398	43.6%	448	-728
Vend	21	2318	6923	25.1%	2353	5867	28.6%	35	-1056
Smoking Status Recorded	**141**	**109944**	**143252**	**43.4%**	**115258**	**132095**	**46.6%**	**5314**	**-11157**
FHT	**64**	**53933**	**42174**	**56.1%**	**56435**	**40767**	**58.1%**	**2502**	**-1407**
OMD	26	24077	31309	43.5%	25291	30694	45.2%	1214	-615
PEC	11	8666	5086	63.0%	9428	4531	67.5%	762	-555
Vend	27	21190	5779	78.6%	21716	5542	79.7%	526	-237

NonFHT	**77**	**56011**	**101078**	**35.7%**	**58823**	**91328**	**39.2%**	**2812**	**-9750**
OMD	16	10905	31002	26.0%	11016	27164	28.9%	111	-3838
PEC	40	34306	42985	44.4%	36680	39616	48.1%	2374	-3369
Vend	21	10800	27091	28.5%	11127	24548	31.2%	327	-2543

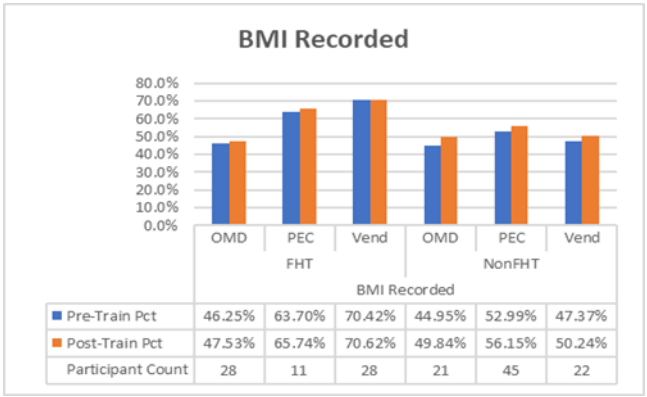
4.1.3.5.1 Participant Improvements Across Patient Data Capture Quality Indicators

Improvements for each data capture quality indicator are displayed as a clustered bar chart, where each pair of bars represent pre- and post-training percentages of patients with data recorded correctly in the EMR. Bar clusters are ordered by training support arrangement within practice type. Counts of clinician participants contributing patient outcomes are displayed below each bar cluster.



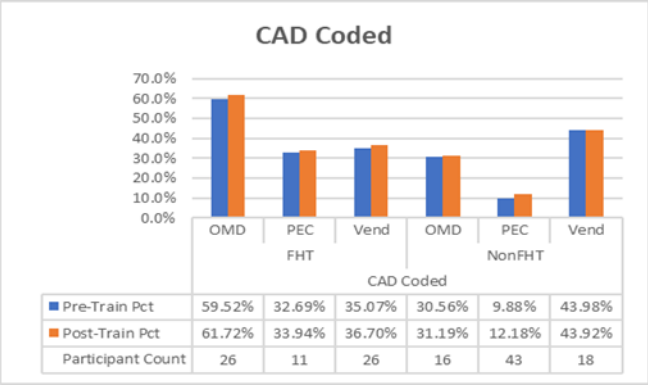
	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	68.56%	79.38%	60.06%	60.70%	30.13%	65.91%
Post-Train Pct	69.60%	81.90%	61.12%	62.78%	35.74%	65.88%
Participant Count	27	11	27	16	43	19

Figure 4 - HTN Coded



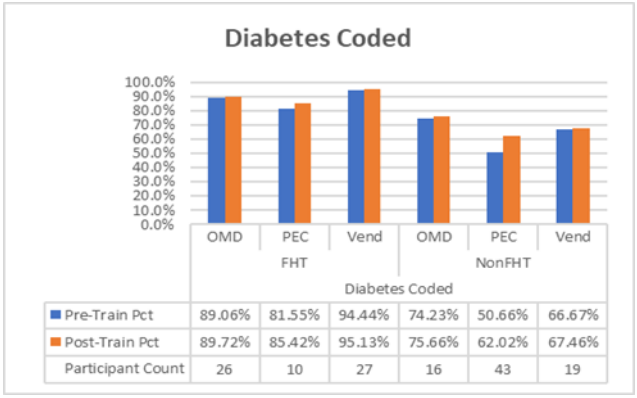
	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	46.25%	63.70%	70.42%	44.95%	52.99%	47.37%
Post-Train Pct	47.53%	65.74%	70.62%	49.84%	56.15%	50.24%
Participant Count	28	11	28	21	45	22

Figure 5 - BMI Recorded



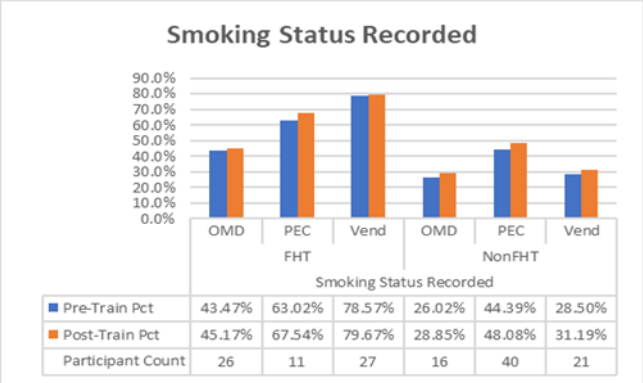
	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	59.52%	32.69%	35.07%	30.56%	9.88%	43.98%
Post-Train Pct	61.72%	33.94%	36.70%	31.19%	12.18%	43.92%
Participant Count	26	11	26	16	43	18

Figure 6 - CAD Coded



	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	89.06%	81.55%	94.44%	74.23%	50.66%	66.67%
Post-Train Pct	89.72%	85.42%	95.13%	75.66%	62.02%	67.46%
Participant Count	26	10	27	16	43	19

Figure 7 - Diabetes Coded



	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	43.47%	63.02%	78.57%	26.02%	44.39%	28.50%
Post-Train Pct	45.17%	67.54%	79.67%	28.85%	48.08%	31.19%
Participant Count	26	11	27	16	40	21

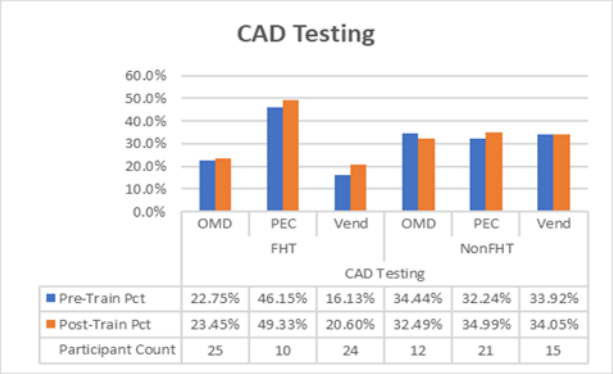
Figure 8 - Smoking Status Recorded

Key observations:

- Pre-training percentages for data capture indicators are higher for FHT participants than for Non-FHT participants across almost all practice types and training support arrangements.
- Pre-post analysis improvements are significantly higher (using a threshold of .01) overall for Non-FHT participants than FHT participants in BMI Recorded, Diabetes Coded, HTN Coded, and Smoking Status Recorded percentages.
- Training support arrangements were not equally distributed between FHT and Non-FHT participants. Approximately 17% of FHT participants were provided with PEC training support, while the remaining 83% of FHT participants were split between OMD and Vendor training support. Approximately 50% of Non-FHT participants were provided with PEC training support, while the remaining 50% of Non-FHT participants were split between OMD and Vendor training support.
- Within FHT participants:
    - There were no significant pre-post analysis improvements between participants with Vendor and OMD training support across any of the data capture indicators.
    - Pre-post analysis improvements were significantly higher (using a threshold of .01) for participants with PEC training support than Vendor training support for Smoking Status recorded.
    - Pre-post analysis improvements were significantly higher for participants with PEC training support than OMD training support for Smoking Status recorded.
- Within non-FHT participants:
    - Pre-post analysis improvements were significantly higher (using a threshold of .01) for participants with OMD training support than Vendor training support for BMI recorded.
    - Pre-post analysis improvements were significantly higher for participants with PEC training support than Vendor training support for Diabetes Coded and HTN Coded.
    - Pre-post analysis improvements were significantly higher for participants with OMD training support than PEC training support for BMI Recorded, but significantly higher participants with PEC training support than OMD training support for Diabetes Coded and HTN Coded.

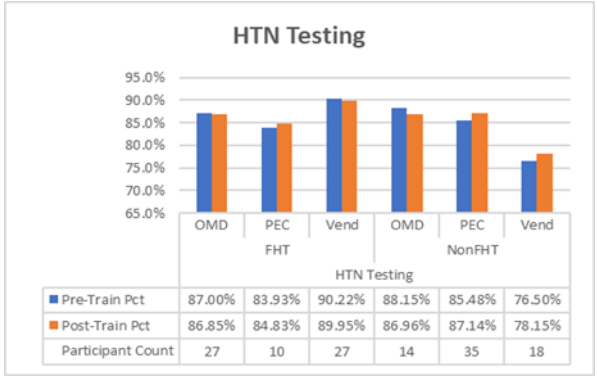
4.1.3.5.2 Participant Improvements Across Patient Outcome Indicators

Improvements for each patient outcome indicator are displayed as a clustered bar chart, where each pair of bars represent pre- and post-training percentages of patients with successful patient outcomes recorded in the EMR. Bar clusters are ordered by training support arrangement within practice type. Counts of clinician participants contributing patient outcomes are displayed below each bar cluster.



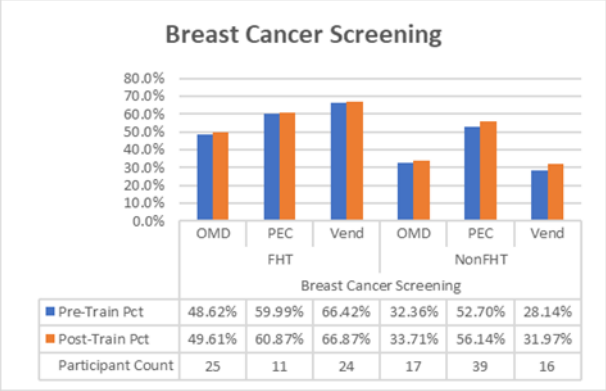
	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	22.75%	46.15%	16.13%	34.44%	32.24%	33.92%
Post-Train Pct	23.45%	49.33%	20.60%	32.49%	34.99%	34.05%
Participant Count	25	10	24	12	21	15

Figure 9 - CAD Testing



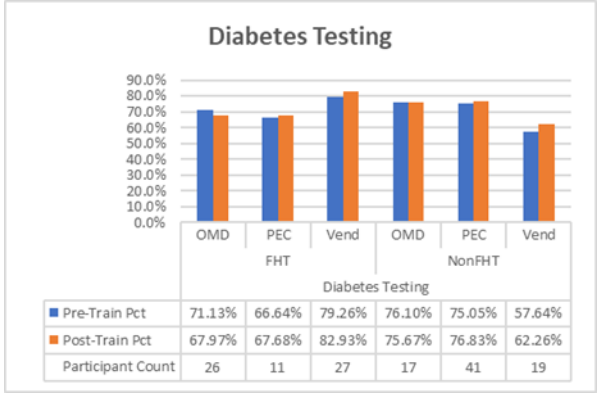
	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	87.00%	83.93%	90.22%	88.15%	85.48%	76.50%
Post-Train Pct	86.85%	84.83%	89.95%	86.96%	87.14%	78.15%
Participant Count	27	10	27	14	35	18

Figure 10 - HTN Testing



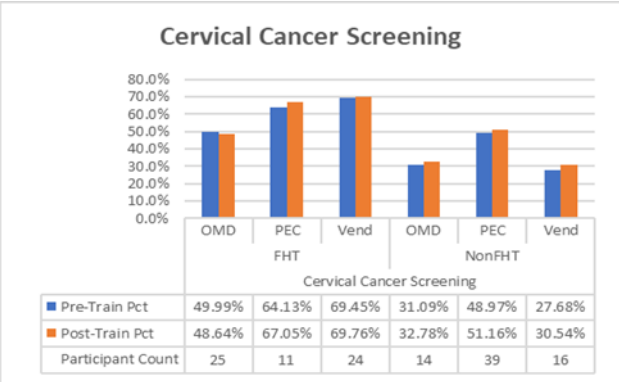
	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	48.62%	59.99%	66.42%	32.36%	52.70%	28.14%
Post-Train Pct	49.61%	60.87%	66.87%	33.71%	56.14%	31.97%
Participant Count	25	11	24	17	39	16

Figure 11 - Breast Cancer Screening



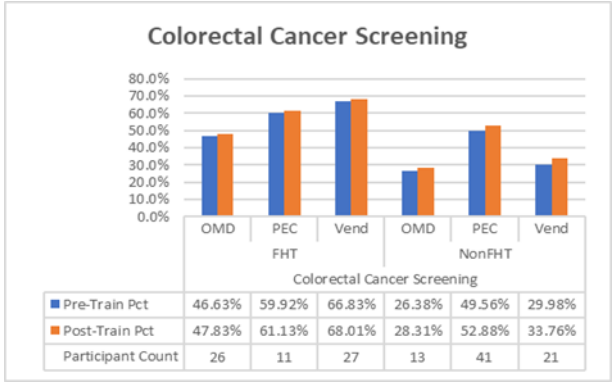
	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	71.13%	66.64%	79.26%	76.10%	75.05%	57.64%
Post-Train Pct	67.97%	67.68%	82.93%	75.67%	76.83%	62.26%
Participant Count	26	11	27	17	41	19

Figure 12 - Diabetes Testing



	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	49.99%	64.13%	69.45%	31.09%	48.97%	27.68%
Post-Train Pct	48.64%	67.05%	69.76%	32.78%	51.16%	30.54%
Participant Count	25	11	24	14	39	16

Figure 13 - Cervical Cancer Screening



	OMD	PEC	Vend	OMD	PEC	Vend
Pre-Train Pct	46.63%	59.92%	66.83%	26.38%	49.56%	29.98%
Post-Train Pct	47.83%	61.13%	68.01%	28.31%	52.88%	33.76%
Participant Count	26	11	27	13	41	21

Figure 14 - Colorectal Cancer Screening

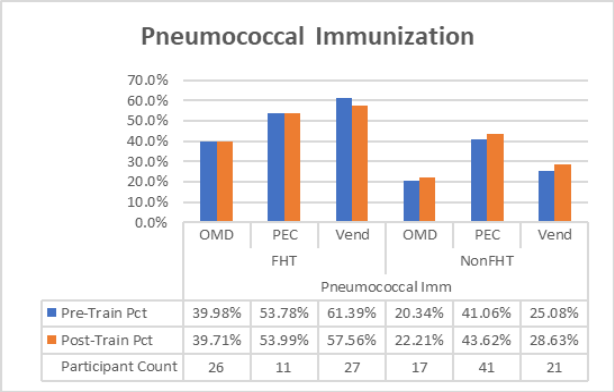


Figure 15 - Pneumococcal Immunization

Key observations:

- Pre-training percentages for patient outcome indicators are higher for FHT participants than for Non-FHT participants across the three cancer screening indicators and pneumococcal immunization.
- Pre-post analysis improvements are significantly higher (using a threshold of .01) overall for Non-FHT participants than FHT participants in the three cancer screening indicators, Diabetes Testing, and Pneumococcal Immunization.
- As noted with the data capture quality indicators, training support arrangements were not equally distributed between FHT and Non-FHT participants. PEC training support was disproportionally allocated to Non-FHT participants.
- Within FHT participants:
    - Pre-post analysis improvements were significantly higher (using a threshold of .01) for participants with Vendor training support over OMD training support for Diabetes Testing, but improvements were significantly higher for participants with OMD training support over Vendor training support for Pneumococcal Immunization.
    - Pre-post analysis improvements were significantly higher for participants with PEC training support over Vendor training support for Pneumococcal Immunization.
    - Pre-post analysis improvements were significantly higher for participants with PEC training support over OMD training support for Cervical Cancer Screening.
- Within non-FHT participants:
    - Pre-post analysis improvements were significantly higher (using a threshold of .01) for participants with Vendor training support over OMD training support for Breast Cancer Screening.
    - There were no significant pre-post analysis improvements between participants with PEC training support and Vendor training support for any of the patient outcomes indicators.
    - Pre-post analysis improvements were significantly higher for participants with PEC training support over OMD training support for HTN Testing.

4.2 Indicator Governance and Management

In response to a recommendation from Phase 1, an Indicator Governance approach was developed to provide the processes, structure and strategy for introducing new indicators and maintaining existing indicators for the EMR Quality Dashboard. Early in Phase 2, a proposed governance model was developed, including the key steps for the indicator lifecycle, providing an important component for provincial expansion. The Clinical Advisory Group (CAG) was established during Phase 2 to begin work on selecting the next set of indicators, and to provide clinical oversight for the various aspects of the Indicator Management lifecycle.

The following is a high-level description of the proposed indicator lifecycle:

Intake: Process of gathering new or enhanced indicator recommendations from potential sources such as clinician or practice feedback, health care quality organizations (HQO, AFHTO, etc.), and health system planners (MOHLTC, LHINs).

Selection: Process of evaluating, selecting, and prioritizing indicator recommendations based on criteria such as available clinical standards, clinical relevance, alignment with provincial priorities, and ability to implement using standard data EMR data elements, workflows and functionality.

Define: Process of defining indicator requirements and specifications for each indicator prioritized for development.

Develop: Process of managing indicator development by vendors.

Evaluate: Process of validating indicator development by vendors.

Deploy: Process of deployment of new indicators by vendors and supporting clinicians on using new indicators.

Manage: Change management process for tracking and reporting on indicator updates or revisions, deprecating indicators, addition of new indicators, and version control.

4.3 Dashboard and Indicator Enhancements

Extensive feedback was collected from Phase 1 PoC clinicians through EMR Quality Dashboard orientation sessions, follow-up training, contact by phone or email, and surveys completed by participants at the start and end of Phase 1. From an initial list of over 600 feedback items, prioritized lists of issues and enhancements to Dashboard functionality and Dashboard indicators were compiled.

Enhancement and issue requests were reviewed by the project team, OntarioMD's Chief Medical Officer, and some of the clinicians who were part of the Phase 1 Business

Requirements Working Group (BRWG). A prioritized list of enhancement recommendations and issue resolutions was then presented to each participating vendor and reviewed with OntarioMD, so that an agreed-upon scope of development work for each vendor could be finalized for Phase 2.

Table 6 summarizes the issues and enhancements that were prioritized and subsequently implemented for each of the three EMRs included in Phase 2 of the PoC.

Table 6 *Phase 2 Issues and Enhancements Summary*

EMR	Number of Issues & Enhancements	Total Implemented	Total Deferred	Total Removed
TELUS PS Suite	104	79	14	11
TELUS Med Access	79	60	7	12
OSCAR	109	91	17	1
Total	**292**	**230**	**38**	**24**

Enhancements or issues were deferred for future consideration if, after collaborative review between the vendor and OntarioMD, it was mutually agreed not to include an item for development in the Phase 2 work scope. Items were removed when, after subsequent review, it was determined that an enhancement or issue had already been addressed or that an enhancement recommendation was not relevant from a clinical or workflow functionality perspective.

Of the 230 enhancements or issue resolutions implemented in Phase 2, there were:

- 169 improvements to indicators;
- 30 improvements to Dashboard functionality;
- 22 improvements to EMR functionality;
- 6 improvements to the implementation process; and
- 3 performance optimization or improvements.

During Phase 2, seven additional indicators were developed to further complement the clinical value of the initial 23 indicators. Furthermore, enhancements to the initial 23 indicators were implemented based on Phase 1 feedback. At the conclusion of Phase 2, 27 out of the 30 indicators were implemented across the two EMRs participating in the PoC, which incorporated all enhancements identified for development and implementation. See Appendix 7.1 for a complete list of the indicators delivered during this initiative.

The remaining three opioid indicators were identified for development and implemented into one EMR to demonstrate the process of promoting a high-priority indicator set for development, as well as to demonstrate the process of allowing an individual vendor to initiate the development and implementation of a new indicator set into the Dashboard.

4.4 Highlights of Evaluation Results

4.4.1 Feedback Log Coding

The Feedback Log was a tool for OntarioMD staff to record observations, comments and concerns encountered in their interactions with participating clinics (recruitment, onboarding, training, etc.) during the PoC. The Log was not initially intended as a data source. However, in recognition of the valuable insights it captured, the project team elected to apply an open coding approach. Codes emerged from patterns identified across entries, and a consolidated list was created of 40 codes across nine issue categories. As of November 2018, 626 entries were logged and coded.

The results of the exercise were used for several purposes, including identifying key themes for further investigation (see Section 4.4.2 Process Evaluation), identifying help desk ticket items requiring follow-up (support and/or technical), and documenting requests for enhancement or customization needs that are important awareness pieces prior to provincial expansion. The table below lists the codes and issue categories developed.

Table 7 Feedback Log Coding Summary

Code	Definition	Rationale for interpretation (examples)	Cate-gory
1	Time	Reported concern about the time commitment associated with adoption (e.g., competing priorities, bad timing)	ADOPTION
2	No interest	Reported lack of interest in participating, not specifically connected to other codes such as time, disruption	
3	Peer pressure	Reported concern about asking, pressuring, or anticipating negative response from other clinicians in the practice	
4	Potential tech problems	Reported concern about potential technical issues (e.g., server speed) based on past experience of implementations	
5	Sustainability	Will we be able to continue using the Dashboard after the PoC ends?	
6	Redundancy	Reported that clinic uses an existing tool they perceive as performing the same function, therefore not needed	
7	Incentives	Reported query regarding incentives to participate (e.g., CME credits)	
8	Cost	Reported uncertainty about associated costs ("Are there hidden ones?")	
9	Dashboard administration	Clinic staff indicated that they want to oversee the management and training of the Dashboard for the participating physicians	AGREEMENT
10	Lead/Contract signoff	Feedback indicates concerns about obtaining the lead physician's signature, signature collection, or issues with signing a contract in general	
11	Data quality issue	In using Dashboard, participant identifies a data quality issue (not specifically attributable)	DATA
12	Data display	Concerns with how data is displaying, including expectations for units of measurement, labels, and visualizations	
13	Data protection	Participant notes a concern with privacy and security of data, including questions about the technical aspects of data protection	
14	OMD access	Concerns about what OntarioMD has access to from the EMR	
15	Uses ENCODE	Some clinics use ENCODE[1] which may affect how data is identified for Dashboard pulls	
16	Speed	Functions taking undue time, tiles taking long time to load, timing out, related to server or unspecified issues (impact on refresh rate)	EMR TECHNICAL
17	Compatibility	Questions regarding compatibility, interoperability with other tools in use	
18	Product differences	Differences noted in how Dashboard functions between the two EMRs in the PoC (noted by PEC)	
19	Enhancement request	Requests for additions including tiles, columns, customizability	FUNCTION-ALITY

[1] ENCODE is a standardized nomenclature that is used in some clinics, with implications for how an EMR reads data.

20	Limitation	Limitations revealed through regular workflow, including ability to annotate, access to help tools, inferiority to other tools in use (EWFHT), sharing barriers	
21	Ticket item	Items requiring correction (incorrect pulls not due to data quality, incorrect formatting, parameter issue)	
22	Positive feedback	Functionalities and features clinicians found to be useful / add value	
23	Clinic staff utility	Questions regarding passwords, permissions, portability of reports and other access issues for all the clinic staff who need to use Dashboard	
24	Practice management	Participants asking how to use Dashboard to improve billing and efficiency, and use across practice staff	
25	Indicator detail information	Physicians asking for details about the indicators in the Dashboard	**INDI-CATORS**
26	Indicator criteria	Physicians requesting modifications to indicators	
27	T&C Issues	Physician refuses to sign Terms and Conditions (T&C) or have questions about who should sign the T&C	**LEGAL**
28	T&C Language	Physicians requesting clarification and expectations regarding the meaning behind specific language in the T&C	
29	Incorrect practice type	Usually specialist practice not appropriate for PoC	**RECRUITMENT**
30	Incorrect contact	PEC reports wrong lead or incorrect contact information	
31	Unresponsive	No or delayed response from practice	
32	Incorrect system	Either not on EMR or not on the correct EMR for PoC	
33	Enthusiasm	Expression of interest and support for spread	
34	Problem solving	Issue identified (and possibly resolved) through training	**TRAINING**
35	Informational question	Question about best practice or definition that can be addressed through training (“What does this mean?”)	
36	Functional question	Question about functionality that can be addressed through training (“Can it do…?”)	
37	Training process issue	Difficulties, primarily with remote (Skype)	
38	Training resources	Access to tools and resources (e.g., test environments, screenshots, better access to help guides) to facilitate client support	
39	Patient chart organization	Physician indicated specific chart notation and organization for ease of use	
40	More time needed	Need training sessions to be longer	

4.4.2 Process Evaluation

Themes emerging from the Feedback Log coding were used to inform a process evaluation, planned and conducted as a practicum project by a University of Waterloo Masters in Health Evaluation student. The coding key for transcribed interviews shown in Figure 19 was structured into three categories reflecting stages of Dashboard participation – "Adoption, Training and Utilization" – with a fourth "Recommendation" category to capture recommendations for provincial rollout.

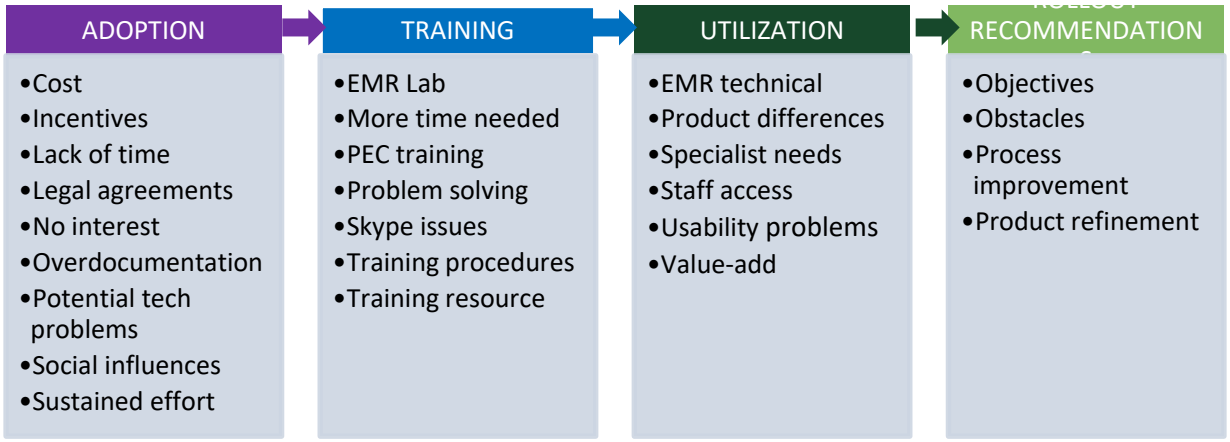


Figure 16 - Process Evaluation

This evaluation confirmed several value-add aspects of the Dashboard:

- Ability to easily view real-time data at a moment's notice (a source of excitement for clinicians as they entered training);
- Improved awareness of data quality on the part of clinicians;
- Improved staff engagement leading to more efficient or effective EMR use;
- Facilitated a conversation between OntarioMD staff and clinicians sooner regarding manual data quality review, synthesis of findings; presentation to staff can be a lengthy process compared to immediate visualization; and
- PREVCare form supports a proactive approach to improve patient outcomes.

In addition to these positive findings, the evaluation revealed commonly held concerns, which have led to recommendations to improve processes (specifically in the categories explored – adoption, training and utilization) prior to provincial rollout. These have been incorporated into the Findings and Recommendations in Section 5 of this report.

4.4.3 Endpoint Survey

An Endpoint Survey was conducted at the end of Phase 2, and distributed to just under 400 users. The purpose of the Endpoint Survey was to gain insight on the respondents' experiences and to determine if support and training were sufficient during their use of the Dashboard. Respondents were asked to report on their perceived EMR data quality before and after participation, indicate the interventions they implemented to improve data quality, frequency of use, perceived benefits and barriers to adoption. Main highlights:

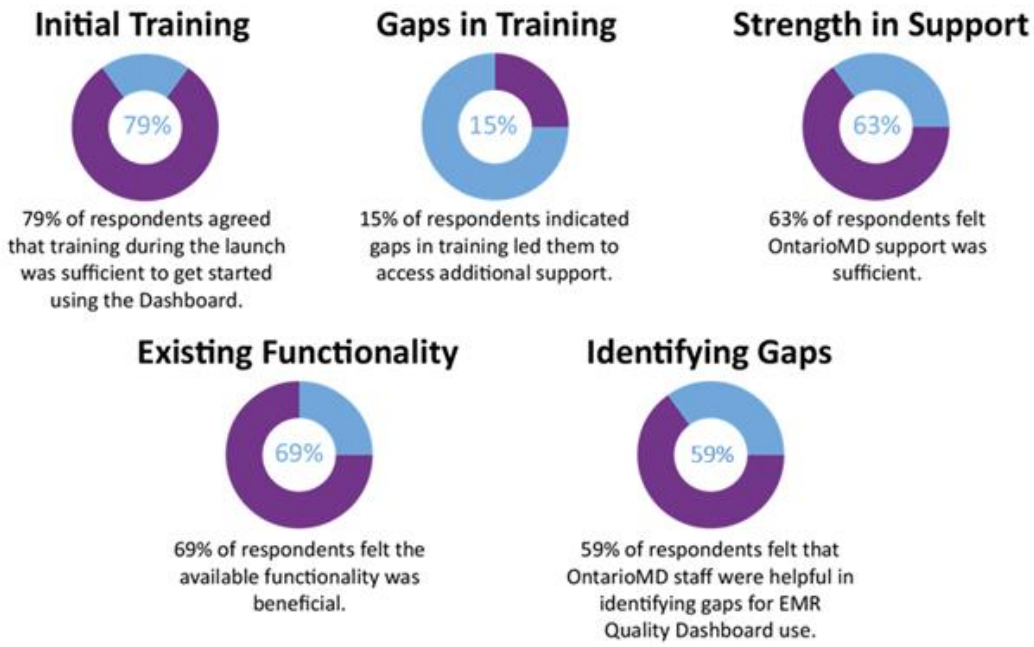


Figure 17 - Support and Training

The following key themes were identified in the Endpoint Survey results:

- **Dashboard as a Catalyst for Change**: The Dashboard has been a valuable starting point in highlighting EMR data quality issues and is a strong segue into future quality improvement initiatives.
- **Clinician Capacity for Change**: Users are generally in the early phases of managing EMR data quality, but have very little capacity to take on additional work to address data quality.
- **Support as a Value-Add**
    - In-person support was greatly appreciated and valued by users.

4.4.3.1 Improvements in Data Quality

A total of 25% of respondents indicated that, prior to participating in the PoC initiative, they were advanced users with respect to documenting patient data in a consistent, repeatable and complete way.

- After participating, this figure had increased to 53.57% of respondents.

A total of 37.5% of respondents indicated that, prior to participating in the initiative, they needed improvement with respect to documenting patient data in a consistent, repeatable and complete way.

- After participating, this figure had decreased to 8.93% of respondents.

The most cited intervention by practices was "I updated information to address data quality as patients were seen," at 67.86%. Other common interventions were:

- "I dedicated time to address data quality in my EMR" (51.79%);
- "I have dedicated resources to address my data quality needs on an ongoing basis" (30.36%); and
- "I made use of OntarioMD Practice Enhancement Consultant engagements" (21.43%).

The most common data quality improvements indicated by respondents include:

- updating patient records to correct data quality issues (33%);
- using disease or diagnosis coding (26%);
- using the drill-down patient lists to investigate and update patient records (23%);
- using the drill-down patient lists to recall patients for appointments proactively (20%); and
- recording data in fields that are used by the indicator (15%).

4.4.3.1.1 Barriers to Use

Barriers cited by respondents:

- "I did not have sufficient time to implement data quality improvement measures" (69.94%);
- "I did not have sufficient staff available to implement data quality improvement measures" (55.36%);
- "I did not implement data quality measures because I was unsure what to focus on" (10.71%); and
- "I did not experience any barriers to data quality improvement" (10.71%).

Given the high percentage of respondents citing a lack of capacity to implement data quality measures (69.94%), it will be important to explore other mediums for delivering support. Online resources were cited by 47% respondents as a means of enabling the ongoing use of the Dashboard behind in-person support, which was identified by 57% of respondents. This result also highlights the need to augment the value proposition of adopting the Dashboard and the other services available under the quality measurement program as the program competes with other clinician priorities.

4.4.3.2 Realizing the Benefits of Using the Dashboard

Benefits cited by respondents as a result of using the Dashboard:

- "Helped to identify patients requiring follow-ups" (64.29%);
- "Gave me the ability to drill down on an indicator to access patient lists" (58.93%);
- "Prompted our practice to update information to improve data quality" (53.57%);
- "Allowed me to access data in real-time" (39.29%); and
- "Allowed for faster follow-ups of the defined patients" (25%).

5 Findings and Recommendations

As an important aspect of the PoC, OntarioMD compiled findings based on review and assessment of the various activities that took place during Phase 2. Based on findings extracted from the indicators and the Endpoint Survey, several themes emerged:

- Dashboard enables quality improvement;
- Improvement varies across different practice models;
- Clinicians lack the time and capacity for QI; and
- Change management support is important.

The findings detailed in this section are based on review and assessment of the Phase 2 project activities. They outline potential gaps and areas for improvement. In addition, recommendations outlined will inform planning for the next phase to scale the EMR Quality Dashboard for province-wide availability.

The findings and recommendations in this section are organized by the two main objectives in Phase 2:

- **Enhance** – EMR or Dashboard functionality, additional indicators, performance optimization; See Section 5.1 Enhance - Dashboard and Indicator Enhancements for full details.
- **Expand** – Increase adoption and use of the Dashboard; See Section 5.2 Expand - Dashboard Adoption and for full details.

5.1 Enhance - Dashboard and Indicator Enhancements

5.1.1 Dashboard Enhancements

- Vendors base their approach to prioritizing and implementing Dashboard enhancements differently according to their EMR products and development lifecycles; these timelines did not always synchronize with the PoC's timelines.
- Performance-related issues are challenging to address, as many factors can contribute to the performance of Dashboard graphics refreshing and the user's ability to drill down to a patient list from a Dashboard graphic element.

5.1.2 Indicator Enhancements and Expansion

- During Phase 2, OntarioMD was heavily involved in managing EMR vendor development of indicator enhancements and new indicators. The vendor engagement approach will need to be assessed and potentially adjusted as the initiative moves into provincial expansion.
- The approach to indicator development involved providing each vendor with EMR-specific details in indicator definitions. Moving forward, this type of approach would be difficult to sustain across the entire vendor domain.
- The process for validating indicator development is more complex than the process to validate functionality development by vendors. The validation process requires OntarioMD to provide a combination of technical expertise, EMR workflow expertise,

and clinical knowledge in order to fully assess whether an indicator is measuring intended outcomes using best practice workflows.

- Validation sign-off required different vendor demonstrations, such as screenshots showing query logic, graphic output, and patient drill-down lists and in some cases review of query logic.
- Development of new opioid indicators was complex for several reasons: during the PoC, there were no EMR-specific definitions at the start of development, the computation involved for opioid daily dosage was more complex than computations required for previous indicators, and there was limited ability to assess vendor capacity for developing complex indicators or indicators including non-standard data elements in a timely manner.

5.1.3 Recommendations

1. **Maintain clinically-driven focus:** Clinical involvement will continue to drive selection and identification of indicators, the evolution of Dashboard requirements and the adoption of the Dashboard by other clinicians. The continuation of a Clinical Advisory Group to support Dashboard development and indicator governance will help ensure clinical focus remains central to the ongoing expansion of both the Dashboard and indicators. Other considerations for strengthening clinical engagement could include increased use of Peer Leaders in training or advising clinicians, and the formation of specific Communities of Practice to collect additional feedback on Dashboard issues, potential enhancements, and indicator recommendations.

2. **Expand core data set or EMR functionality specifications to address indicator scope:** Indicator development to date has revealed limitations in relying solely on the current core data set and core EMR functionality. Future indicators of interest to clinicians may address current recognized gaps through the evolution of OntarioMD specifications. In the interest in expanding Dashboard adoption and use beyond family physicians, thought and consideration should be given to functionality and data elements to support specialist-specific indicators.

3. **Formalize Dashboard validation:** A formalized vendor validation process supported by subject matter expertise is recommended to both formulate and validate clinical workflow scenarios that will produce desired Dashboard outcomes.

4. **Develop EMR-agnostic indicator specifications:** Indicator specifications should be developed based on generic functionality, EMR workflows, and core data set elements, without providing details specific to an EMR.

5. **Address gaps in indicator governance and/or management process:** The process used during the PoC should be expanded and refined to operationalize the indicator governance and lifecycle by:

- identifying resources and stakeholders to support all phases of an ongoing Indicator Management lifecycle;
- developing tools and processes for the internal Indicator Management Lifecycle;
- finalizing the process and criteria for selecting, prioritizing, and approving new or enhanced indicator recommendations; and
- collaborating with the validation team to develop specific testing scenarios for validation, to ensure vendor development of indicators satisfies technical requirements and clinical or EMR workflow requirements.

5.2 Expand - Dashboard Adoption and Usage

5.2.1 Recruitment and Enrollment

- Lack of time and competing priorities were the top two adoption challenges cited by clinicians.
- Many participating clinicians shared concerns about who will have access to shared data, and the fact that the vendor is hosting the aggregated data.
- Challenges in the administration of agreements sometimes hampered OntarioMD staff in their ability to deploy to practices.

5.2.2 Clinical Readiness Evaluation

- A more fulsome readiness evaluation is required to address potential deployment or performance issues that could impact Dashboard adoption, such as server capacity, firewall restrictions, completion of configuration steps, etc.

5.2.3 Training

Challenges around training became increasingly apparent during Phase 2, particularly the timing of user training, the availability of resources to support training activities, and adhering to the training curriculum (as opposed to addressing data quality issues). Key findings are organized according to two categories of training: internal training of OntarioMD staff, and training of clinicians on the use of the Dashboard.

Internal Staff Training

- **Train-the-Trainer**: Staff indicated that the timeliness of training and knowledge transfer is integral to ensuring they are prepared to support the adoption process.

Access to the EMR Lab

The most prominent feedback from OntarioMD staff was the desire for hands-on access to the Dashboard prior to engagement with clinics. This was addressed in the latter part of the PoC through access to OntarioMD's EMR Lab, a solution that received very positive feedback.

Clinician Training

- Both staff and users, through survey responses, felt training was valuable. Many OntarioMD staff members indicated it would be ideal to have more time to work with users, and 81% of users agreed that access to Dashboard training was valuable while 79% of users felt that training was sufficient to get started using the Dashboard.
    - OntarioMD will continue to explore other modes of providing user training as well improving the training curriculum.
- There are some limitations to using Skype for remote training, including technical issues as well as user discomfort with the technology.
- Three types of training support options were available during the PoC:
    1. Vendor-delivered training without in-depth OntarioMD staff support;
    2. OntarioMD-delivered training without follow-on, in-depth OntarioMD staff support; and
    3. OntarioMD-delivered training with follow-on, in-depth OntarioMD staff support.
- Based on assessment of indicator improvements, training support option 3 appeared to be the most effective in impacting improvements.
- Clinicians within FHTs had a higher percentage of patients (combined across training support options) with data properly coded and with up-to-date cancer screenings prior to training than clinicians within other practice types.
- Clinicians within FHTs improved significantly less (combined across training support options) for BMI Recorded, Diabetes Coded, HTN Coded, Smoking Status Recorded, Diabetes Testing, Pneumococcal Immunization, and the three cancer screening indicators than clinicians within other practice types.
- Adoption, training and utilization were more effective when clinic staff were also trained, either by OntarioMD staff or by the physician (train-the-trainer model). However, limitations to staff access to the Dashboard other than through a physician's login was a significant barrier to success.

5.2.4 Support

More than half (57%) of Endpoint Survey respondents indicated that "in-person engagement with an OntarioMD Practice Enhancement Consultant" was the most essential resource influencing their sustained use of the Dashboard. This reflects the strong relationships OntarioMD's staff have with physician practices. However, it also highlights potential challenges for scaling the Dashboard provincially, given the amount of in-person engagement required on both the user and staff side.

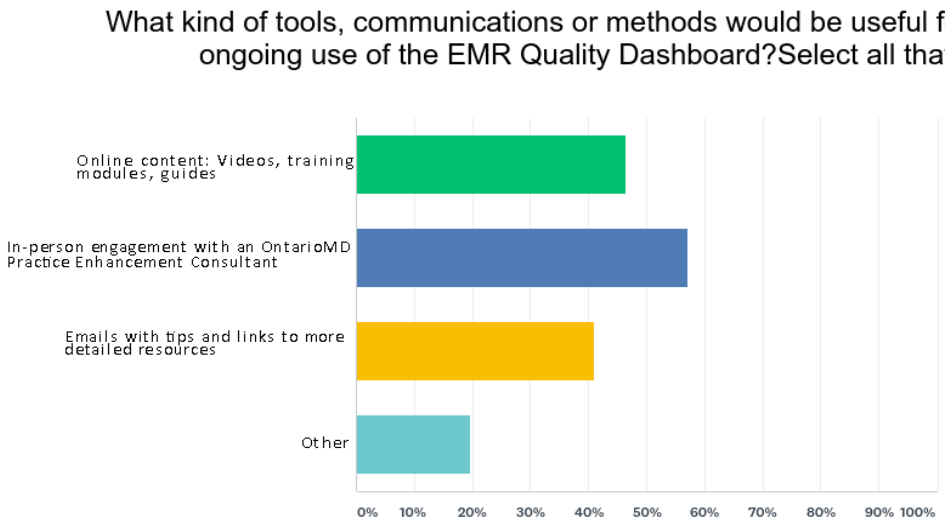


Figure 18 - Survey Question - Tools, Communications and Methods to Support EMR Quality Dashboard (Endpoint Survey)

OntarioMD staff cited a strong need to have access to an issue management process that includes engaging users with regular updates while issues are sorted. This would include a mechanism allowing the project team to gather positive feedback to dynamically update the deployment approach.

5.2.5 Recommendations

1. **Refine Dashboard adoption approach:** In response to the data and feedback collected from existing users, a multi-faceted value proposition – highlighting potential time savings and practice enhancements, for example – should be developed and marketed to highlight the value of the Dashboard and address common barriers to adoption. The value proposition should also consider potential savings in time to both the practice and the health system. Beyond the Dashboard tool, training and support options should consider the unique needs of clinicians and be customized according to those requirements.

2. **Expand training options:** Along with OntarioMD-led training, other training options should be explored to facilitate scaling the initiative to a larger user base, such as train-the-trainer, and self-directed online training modules that users may access at their convenience.

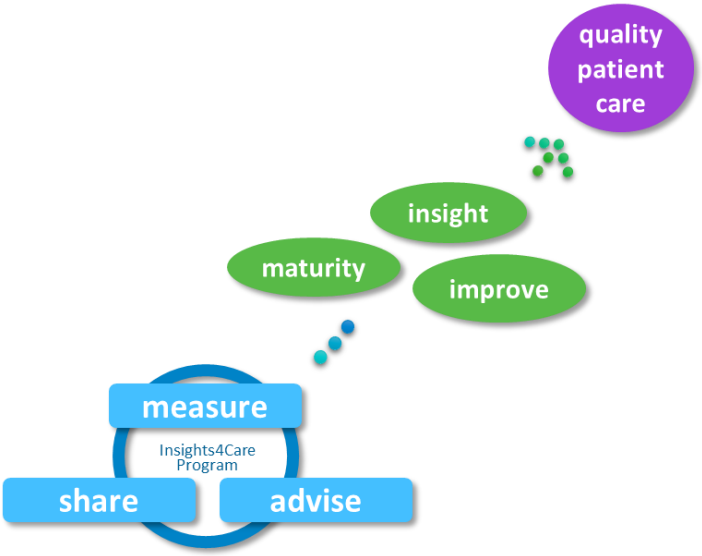
3. **Ensure stakeholder readiness:** Introducing a new tool into a practice is a recognized change process with many unique nuances for users. A readiness assessment process should be developed to ensure users are prepared to move forward with deployment. Some aspects of this would include technical readiness and assessment of support that will be required for successful adoption.

4. **Ensure coaching and support:** Preliminary findings suggest that change management support provided to clinicians (such as the type provided by PECs) has a positive impact on quality improvement, especially on indicators measuring EMR data capture quality. OntarioMD needs to ensure that this change management support will continue and has sufficient capacity to address provincial needs.
5. **Address support capacity**: User feedback suggests OntarioMD-led support is the most important value-add element for sustained usage. OntarioMD's capacity to support clinicians should be addressed, including considerations for how a larger user base would be supported without compromising the value users have cited as crucial in their sustained use of the Dashboard. It is clear that while in-person support is valued by users, alternative support mechanisms should be explored as user availability will continue to be a challenge.
6. **Provide proactive support:** Aggregated metrics data from the use of the Dashboard should be used to trigger proactive engagement of users in need of support.
7. **Align resources to optimize impact:** Preliminary findings suggest that a greater impact may be realized by ensuring support resources are available to assist clinicians in non-FHTs.

6 Next Steps and Insights4Care Program

Building on the success from the EMR Quality Dashboard Proof of Concept and guided by our strategic focus on the advancement of clinical practice and patient care, OntarioMD has established the **Insights4Care Program** (i4C) to plan, develop and deliver services required to support primary care quality improvement, to facilitate the effective translation of health system priorities to the practice level and to improve access to community-based EMR data. i4C has three strategic objectives:

1. **Measure** – Provide clinicians with EMR-integrated, actionable, quality reporting and population management tools, such as the EMR Quality Dashboard and indicators.
2. **Advise** – Deliver advisory and coaching support to clinicians and their practices in the implementation of practice improvement initiatives, leveraging their EMRs and OntarioMD's quality reporting tools, e.g., Dashboard.
3. **Share** – Implement the technology platform and associated policies to facilitate access to, and sharing of, physician-level data with health system partners to inform broader regional planning initiatives and provincial program evaluations.



The program will deliver the following benefits to health care stakeholders such as clinicians, Ontario Health Teams, health system planners, and researchers:

- **Improve**: Clinicians will have the data, tools and change management support to make measurable practice improvements, carry out necessary interventions to deliver proactive patient care and able to better align with quality improvement best practices; health system planners will have the means to translate health system priorities to the practice level
- **Maturity**: With capabilities such as population management tools, coaching and support for practice enhancements, and the secured and effective means to share EMR data, practices across Ontario will make significant progress towards EMR maturity, e.g., Level 4 or 5.
- **Insight**: Greater clinical and systemic insight will be realized – individually about each patient, at the practice level, and at the health system level.

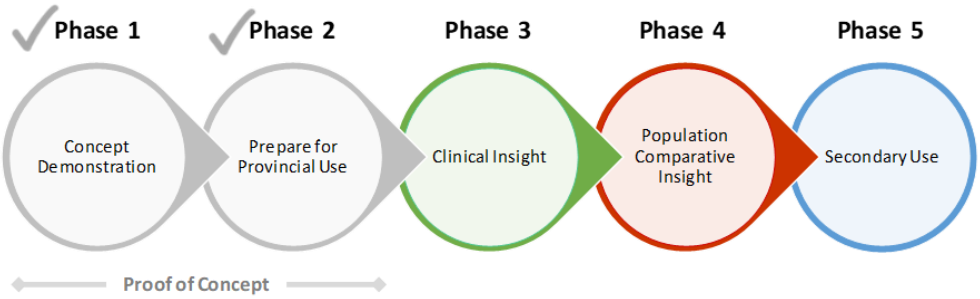
Ultimately, the tools and services offered by the i4C Program will enable health care stakeholders to improve the health of the population and enhance patient experiences and outcomes.

6.1 Roadmap

A gradual and phased approach has been chosen for the implementation of OntarioMD's i4C Program, intended as a continuation and expansion of the EMR Quality Dashboard PoC. Key rationale supporting this approach include:

- Leverage momentum from the EMR Quality Dashboard Proof of Concept Phase 2;
- Focus initially on delivering direct value to clinicians and build on OntarioMD's well-respected role as practice improvement advisor;
- Position OntarioMD as a key provincial partner in primary care quality improvement – working with stakeholders, e.g., MOHLTC, HQO, to translate health system priorities to the practice level;
- Continue with a phased approach ensuring both short-term and long-term objectives can be reasonably met; and
- Broader strategic, policy and program delivery alignment are necessary to support appropriate broader system data use.

The roadmap below illustrates the remaining program phases:



Phased approach to support health care quality improvement, and to enable optimal use of EMR data by physicians and the broader health care system for improving direct patient care.

Figure 19 - Insights4Care Program Roadmap

6.1.1 Phase 3 – Focus on Clinical Insight

- Focus on providing clinicians with greater clinical insights into their patient population through the provincial rollout of the EMR Quality Dashboard and quality improvement support services.
- Clinicians will be able to select from EMR-based Dashboard product offerings aligned with OntarioMD's EMR Quality Dashboard Specification.

- Potential solution vendors are expected to include current EMR vendors with certified offerings along with other vendors.
- Work will be conducted with the MOHLTC to develop a funding strategy and establish incentivization programs for vendor and clinician adoption.

6.1.2 Phase 4 and 5 – Parallel Development to Advance Program

- **Phase 4 – *Population Comparative Insight*:** Provide physicians and other stakeholders with population comparative insight by enabling access to peer comparison analysis and by sharing of aggregated metrics.
- **Phase 5 – *Secondary Use*:** Offering a set of technical and support services to enable access and sharing of community-based EMR data for other purposes, including quality improvement, research, public health, and business analytics.
- The plan to address physicians' and other stakeholders' needs for population comparative insights and sharing/accessing data for secondary use will be addressed through a parallel stream of activities, including requirements for comparison against peers and sharing of aggregated metrics.
- Planning for these future phases will be informed by consultation with stakeholders and market scans of available solutions.
- Identify the additional future OntarioMD services and business capabilities.

6.2 Phase 3

6.2.1 Provincial Expansion Strategy

The focus of Phase 3 is to build on the success of the Proof of Concept and to expand the initiative, by allowing more clinicians to have access to the EMR Quality Dashboard, by having more EMR vendors incorporating the EMR Quality Dashboard in their product offerings, and by adding more indicators to the Dashboard under the Insights4Care (i4C) Program. The provincial expansion strategy is expected to include:

- **Change Management Support**: Recognizing the importance of change management support in the adoption of digital health tools, the i4C EMR Dashboard and i4C Advisory Services will be promoted as a combined service offering. Clinicians will be encouraged to engage with OntarioMD's Practice Advisors in order to maximize the value of the Dashboard and to receive on-going support as they utilize the tool to develop insights and to undertake quality improvement activities.
- **EMR Vendor Offerings**: Phase 3 will continue to focus on signing up users of the three EMR offerings that have implemented EMR Quality Dashboard as part of the Proof of Concept: OSCAR EMR, TELUS PS Suite and TELUS Med Access. Once additional EMR offerings have implemented the i4C EMR Dashboard and completed all validation requirements, users of these offerings will be eligible for adoption.
- **Indicator Governance**: An important goal of Phase 3 is to continue adding more quality indicators onto the Dashboard. This activity is achieved through the Indicator Governance process which involves the evaluation, selection and translation of existing

clinical indicators developed by leading QI organizations, into quality indicators that can be expressed within the i4C EMR Dashboard.

- **Clinicians**: The target clinicians for Phase 3 will continue to be primary care providers (family physicians and nurse practitioners), since the initial set of 30 indicators are more geared for these clinician types. Scope will be expanded to include medical specialists in the future especially when specialty-specific indicators are added to the Dashboard.
- **Care Models and Regions**: Recruitment in Phase 3 will cover all geographic regions in the province, and all primary care models including Ontario Health Teams as they are formed. The expansion will adhere to the equity principle.
- **Regional Partnership**: A number of regional and provincial organizations are helping frontline clinicians with quality reporting and practice improvements. OntarioMD will look to align and leverage these existing QI resources to assist in the rollout of the i4C EMR Dashboard, and to coordinate quality improvement activities, e.g., recruitment, training, coaching.

6.2.2 High Level Plan

Phase 3 is estimated to span a two-year period with the first year focusing on the publication of the OntarioMD i4C EMR Dashboard specification and indicators, and provincial expansion of the i4C EMR Dashboard with the three current EMR product offerings. During year 2, the focus will be on increasing the adoption numbers for clinician use of the Dashboard and having more EMR product offerings certified for the Dashboard Specification. The key activities and deliverables for Phase 3 are summarized below:

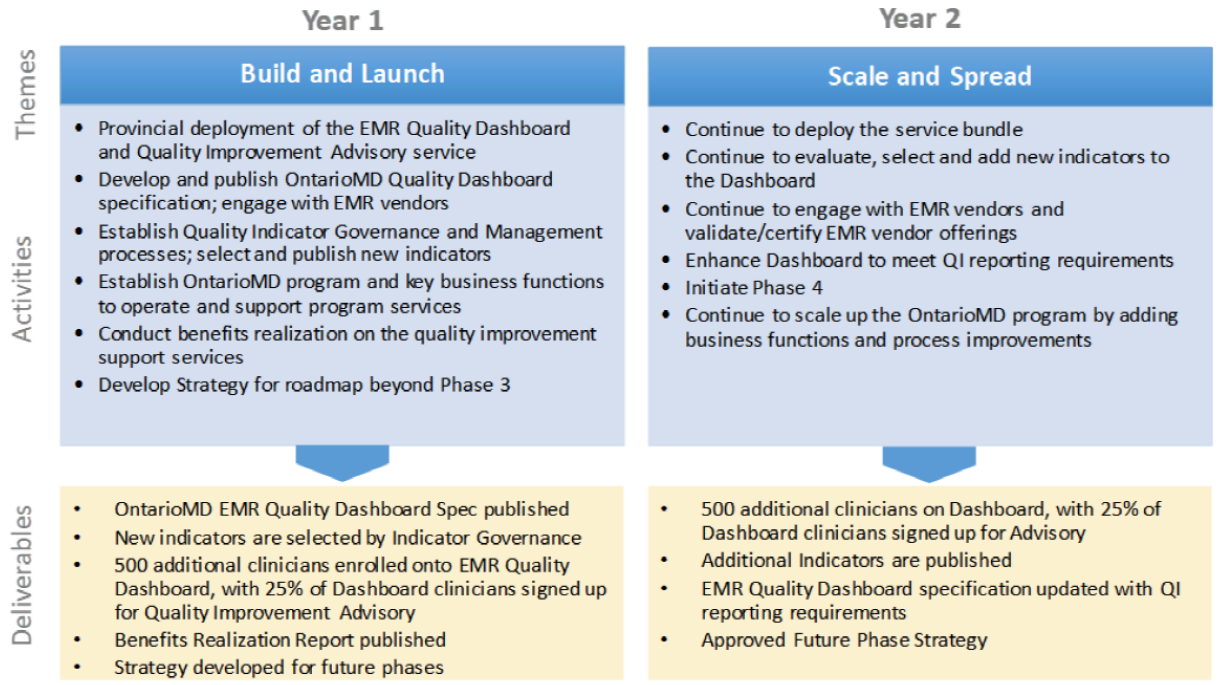


Figure 20 - Phase 3 Activities and Deliverables

7 Appendices

7.1 Indicators

EMR Quality Dashboard Indicators

Practice Management	Chronic Disease Management	Preventative Screening	Preventative Care Bonus	Opioid Management
Patient Status	Coronary Artery Disease Identification	Breast Cancer Screening	Breast Cancer Screening	*Opioids Prescribed
	Coronary Artery Disease Testing	*Breast Cancer Recall	Cervical Cancer Screening	*Opioid and Benzodiazepine Co-Prescribing
	Coronary Artery Disease Overdue	Cervical Screening	Colorectal Cancer Screening	*Opioid Daily Dosage: Total MMEq/day
	Diabetes Identification	*Cervical Cancer Recall	Influenza Immunization	
	Diabetes Testing	Colorectal Cancer Screening	Childhood Immunization	
	Diabetes in Range	*Colorectal Cancer Recall		
	Hypertension Identification	Influenza Immunization		
	Hypertension Testing	Childhood Immunization		
	Hypertension Overdue	*Childhood Immunization Recall		
		Pneumococcal Immunizations		Legend
		Obesity		* Added in Phase 2
		Smoking		

7.2 Indicator Successful and Unsuccessful Outcome Definitions

Indicator Name	Relabeled Name	Outcomes	
CAD Identification	CAD Coded	*Successful:*	Patients with CAD diagnosis code documented in EMR
		Unsuccessful:	Patients without CAD diagnosis documented but with other data documented that may indicate CAD diagnosis
CAD Testing	CAD Testing Up-To-Date	*Successful:*	All tests up to date
		Unsuccessful:	1+ tests overdue
Diabetes Identification	Diabetes Coded	*Successful:*	Patients with Diabetes diagnosis code documented in EMR
		Unsuccessful:	Patients without Diabetes diagnosis documented but with other data documented that may indicate Diabetes diagnosis
Diabetes HbA1C Testing	Diabetes Testing Up-To-Date	*Successful:*	2+ tests in past year
		Unsuccessful:	< 2 tests in past year
Diabetes HbA1C In Range	Diabetes In Range	*Successful:*	Latest A1C <= 7%
		Unsuccessful:	Latest A1C > 7%

Indicator Name	Relabeled Name	Outcomes	
HTN Identification	HTN Coded	*Successful:*	Patients with HTN diagnosis code documented in EMR
		Unsuccessful:	Patients without HTN diagnosis documented but with other data documented that may indicate HTN diagnosis
HTN Testing	HTN Testing Up-To-Date	*Successful:*	1+ test up to date
		Unsuccessful:	All tests overdue
Breast Cancer Screening	Breast Cancer Screening Up-to-date	*Successful:*	Screening up to date
		Unsuccessful:	Screening overdue
Cervical Cancer Screening	Cervical Cancer Screening Up-to-date	*Successful:*	Screening up to date
		Unsuccessful:	Screening overdue
Colorectal Cancer Screening	Colorectal Cancer Screening Up-to-date	*Successful:*	Screening up to date
		Unsuccessful:	Screening overdue
Childhood Immunizations	Childhood Immunizations Complete	*Successful:*	Complete
		Unsuccessful:	Incomplete or Declined
Influenza Immunization	Influenza Immunization Complete	*Successful:*	Complete
		Unsuccessful:	Incomplete or Refused
Pneumococcal Immunization	Pneumococcal Immunization Complete	*Successful:*	Complete
		Unsuccessful:	Incomplete or Refused
Obesity Screening	BMI Recorded	*Successful:*	BMI recorded as obese, overweight, normal weight, or underweight
		Unsuccessful:	BMI not recorded
Smoking Status	Smoking Status Recorded	*Successful:*	Documented as Smoker or Non-smoker
		Unsuccessful:	Not Documented