



# PHYSICIAN QUALITY IMPROVEMENT OUTCOME EVALUATION

Evaluation Report August 2021

## **EXECUTIVE SUMMARY**

## Background

The Physician Quality Improvement (PQI) initiative was created in 2015 with the goal of engaging frontline physicians in Quality Improvement (QI) by providing them with training and support to implement their QI ideas through learning action projects. The primary objectives of the PQI initiative are to build physicians' QI knowledge and skills, strengthen QI culture, and contribute to the Institute for Healthcare Improvement (IHI) Quadruple Aim). To date, about 1,600 specialist physicians, and family physicians, as well as some residents, fellows and other medical staff (about 2%) participated in PQI Level 2 and Level 3 training. About 550 learning action projects have been undertaken as part of Level 3 training.

## **Evaluation Purpose and Methodology**

The purpose of this evaluation was to assess the outcomes achieved by the PQI initiative to date, including short-term outcomes (improved relationships and collaboration among health partners), medium-term outcomes (strengthening of QI culture, patient-centric QI, sustainability), and long-term outcomes including contribution to the IHI Quadruple Aim (improving patient and physician experience, improving health outcomes, and reducing costs to the health care system).

The methodology used for this evaluation involved a review of PQI documents, files, and data; interviews with 46 key informants (health authority steering committee and Specialist Services Committee (SSC) representatives); a survey of 27 PQI team members; and 21 interviews with physicians leading 15 selected learning action projects and their team members. The annual PQI steering committee and PQI team survey data (2018 to 2021), as well as the pre and post PQI training survey and PQI physician alumni surveys (2020) were reviewed.

## **Major Evaluation Findings**

## Improving Collaboration and Relationships

The PQI initiative has been highly effective in increasing collaboration and building positive relationships among health partners, particularly between physicians and their respective health authorities. In 2021, 93% of steering committee members surveyed agreed that the PQI initiative positively impacted physician engagement with health authorities and 81% agreed that PQI has increased physician participation in health authority-led QI.

The physician engagement with their local work setting also improved. Physicians participating in post-training surveys over the last 3 years were consistently more likely to report that they have meaningful input into changes affecting their practice, their contribution is valued, and they are satisfied with the organization in which they work. Interviewed physicians also reported increased opportunity to engage with the health authority through the steering committee, and other working groups via dyad partnership and through PQI networking opportunities. The perceived effectiveness of the PQI health authority steering committees and the collaborative relationship among health partners varies somewhat across the province. It takes time to build trust

and reduce barriers to collaboration. The level of collaboration may be impacted by some of the emerging issues and challenges relating to managing growth of the PQI initiative, allocation of funding, physician and project selection for level 3 training, alignment with health authority priorities, and decisions regarding sustainability and physicians' ongoing engagement in QI.

Most learning action projects are perceived to be well-aligned with the broader priorities of health authorities, despite the reportedly low level of awareness of the health authority priorities among at least half of physicians who completed a learning action project. Assessment of the proposed learning action projects' alignment with health authority QI priorities has been used to select physicians to participate in PQI level 3 training and learning action projects in some health authorities where demand is high. This can create additional challenges and potential differences in opinion within the steering committees.

## Strengthening Culture

The PQI initiative contributes to building QI culture through physician training and application of their QI skills through learning action projects. Physicians participating in PQI training reported a significant increase in their knowledge, skills, and confidence in leading quality improvement projects and initiatives (over 50% increase in post-training self-assessment). Most (84%) of the surveyed steering committee members in 2021 reported that PQI has increased physicians' QI capabilities.

The PQI initiative has encouraged a patient-centric approach to quality improvement by engaging patient partners at decision-making tables (steering committees), and prioritizing learning action projects that involve patients. It is estimated that about half of PQI learning action projects included patient input to some degree. Not all learning action projects are suitable for patient involvement (e.g., projects aiming to improve internal health processes); however, those that aim to improve patient experience should make an effort to meaningfully involve patients and seek feedback about the changes achieved.

Quality improvement culture and feasible quality improvements achieved through learning action projects were likely to be sustained at the physicians' place of work, particularly if other health providers, health teams, and administrators were involved in the project, and if the project aligned well with organizational priorities. Although the spread of those improvements to other settings is outside of the scope of PQI, steering committee members are focusing on broadening the impact of PQI by spreading knowledge, success, and lessons learned across the province.

## Impact on IHI Quadruple Aim

The PQI initiative contributed to the IHI Quadruple Aim through training, learning action projects, technical support and expertise, and physicians' engagement in QI. Those contributions are as follows:

- **Improved health outcomes.** By improving processes, procedures, and approaches to patient care, many changes and actions were taken because of PQI training or learning action projects that resulted in better health outcomes for patients, including lives saved.
- **Improved patient experience.** PQI learning action projects demonstrate that QI skills and knowledge, and the support provided by PQI teams, contribute to improved patient

experience of care either directly by changing how the care is provided or indirectly through improving patient health outcomes.

- **Improved physician experience.** PQI has increased physician engagement and satisfaction with their work by building their skills and providing them with tools to improve their work environment, improve the care of their patients, reduce burnout, and provide opportunities for meaningful engagement.
- **Reducing costs to the health care system.** The estimated cost savings of the 5 projects reviewed totaled \$1.9 million annually for the organizations where projects were implemented. An estimated \$13 million in cost savings was achieved by PQI learning action projects that have been sustained.

## **Major Recommendations**

In the collaborative spirit of the PQI initiative, the SSC and its health partners, should work together to:

- 1. Develop strategic direction regarding sustainability and spread by clarifying roles and responsibilities for sustainability, resource allocation for ongoing engagement of physicians, and developing strategies to spread learnings from viable QI learning action projects.
- **2. Manage expectations regarding ongoing engagement of physicians** by developing guidelines and communication materials regarding the potential for future engagement, type of support, and the circumstances under which PQI may provide ongoing support.
- **3.** Manage the PQI initiative's growth and scaling. Consideration should be given to potentially sharing staff across health authority and SSC programs; better communication of health authority priorities and project selection criteria; developing project intake strategies; and balancing resource allocation for new physicians vs. ongoing engagement of alumni.
- **4.** Create guidelines with respect to patient involvement in learning action projects. Projects that are intended to improve patient experience should be strongly encouraged to engage with patients and measure the changes achieved.
- **5. Develop a performance measurement system** to demonstrate the broader impact of the PQI initiative on the health care system.
- 6. Balance regional flexibility with a need for standardization/harmonization of certain aspects of PQI by identifying issues and aspects that could benefit from a standardized process. For other emerging issues (e.g., managing demand, intake process, project selection process), develop guidelines and tools that allow for sufficient flexibility in implementation across PQI health authority steering committees.
- **7. Improve data digitalization and access.** Engage with Ministry of Health and health authority representatives to communicate the importance of prioritizing data digitalization, standardization, and access for overall quality improvement in health care.



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## LIST OF ACRONYMS

CME	Continuing Medical Education
ED	Emergency Department
ER	Emergency Room
ERH	Eagle Ridge Hospital
FHA	Fraser Health Authority
HIV	human immunodeficiency virus
IHA	Interior Health Authority
IHI	Institute for Healthcare Improvement
MOH	Ministry of Health
MRI	Magnetic Resonance Imaging
NHA	Northern Health Authority
PHC	Providence Health Care
PHSA	Provincial Health Services Authority
PQI	Physician Quality Improvement
QI	Quality Improvement
QIWG	Quality Improvement Working Group
SQI	Spreading Quality Improvement
SSC	Specialist Services Committee
UHNBC	University Hospital of Northern BC
VCH	Vancouver Coastal Health
VIHA	Vancouver Island Health Authority

## 1. INTRODUCTION

## **1.1 BACKGROUND**

The Physician Quality Improvement (PQI) initiative was created in 2015 to engage frontline physicians by providing them with an opportunity to receive quality improvement training and resources, and technical support to lead a learning action project and partner with their peers to create meaningful change. The ultimate goal of the PQI initiative is to create and promote a culture of learning, openness, and dedication to quality improvement in the health care system in BC.<sup>1</sup>

The BC Government through the Ministry of Health, in collaboration with the Doctors of BC, has created four joint collaborative committees, including the Specialist Services Committee (SSC)., Together with six BC Health Authorities, SSC has implemented the PQI initiative as one of its twelve programs that aim to engage physicians and health partners, transform care delivery, and develop physician capability.

The QI training consists of introductory, intermediate, and advanced (multi-day) levels<sup>2</sup>, and typically includes online courses, in-person workshops, and learning action projects. The advanced level of QI training involves completing a learning action project, which provides physicians with support to act on quality improvement opportunities within their own practice. They test and implement effective solutions to problems they identify. Each physician is supported by the PQI teams that include data analysts, coordinators, QI advisors.

## **1.2 EVALUATION OBJECTIVE AND SCOPE**

The overarching objectives of this evaluation are to support learning and identify potential opportunities for the continuous improvement of PQI, and to communicate the outcomes/impacts of PQI to stakeholders. The specific objectives of this evaluation are to:

- 1. Revisit the specific activities and short-term outcomes, including improved relationships and collaboration, and alignment with health authority priorities;
- 2. Determine the extent to which the medium-term outcomes of PQI are met including strengthening of QI culture, sustained participation and leadership, and patient-centric perspective; and
- 3. Investigate the extent to which PQI has impacted the IHI Quadruple Aim (long-term outcomes).

## **1.3 EVALUATION METHODOLOGY**

The evaluation was conducted in three phases. The first phase focused on the development of an evaluation work plan, which included a preliminary review of available data and the development of data collection tools. The second phase involved data collection through primary data sources

<sup>&</sup>lt;sup>1</sup> SSC Website: https://sscbc.ca/physician-engagement/regional-quality-improvement-initiative

<sup>&</sup>lt;sup>2</sup> VIHA also offers advanced (level 4) training for PQI alumni.

(interviews and surveys) and a review of secondary data (SSC surveys, documents and files, administrative data, and budgets etc.). The field research was undertaken between March 2021 and June 2021. A detailed description of the various lines of evidence used in this evaluation is provided below.

The evaluation included data collected by the SSC from physicians participating in PQI, and annual surveys of steering committee members, PQI team members and the 2020 Survey of Physician Alumni.

As part of this evaluation, Qatalyst Research Group implemented the following data collection methods:

- Review of documents and files related to the PQI initiative: A wide range of program documents, files, and reports were reviewed. Some examples of the documents reviewed include curriculum and training data including level 1, 2, and 3 training curriculums in each health authority, PQI Working Groups (WGs) terms of reference, and data on the total number of physicians who have participated in the training.
- PQI learning action project posters/storyboards including any information available online, as well as the health authority storyboard compilation booklets.
- SSC Exchange database and SSC online articles about PQI and guality improvement projects.
- SSC annual reports from 2016 to 2020.
- Annual budgets, including the PQI guarterly financial reporting Excel sheet, the budget information appended in the annual reports, and the PQI return on investment analysis Excel sheets.
- Health authority annual work plans.
- PQI steering committee and working group documents including the terms of reference, operating guidelines, and the Physician Master Agreement.
- Previous evaluations.
- Health authority information (Online).
- IHI documents including information available online on the IHI Triple/Quadruple aim and the six dimensions of health care quality.
- **Extensive interviews with 46 key informants:** The purpose of the interviews was to obtain input on various aspects of the PQI initiative, including the overall impact to date. All key informants are involved in PQI health authority steering committees including health authority representatives (14), clinically active physicians (11), patient partners (8), physicians QI advisors (4). About a dozen of key informants are members of other working groups and decision-making tables (e.g., PQI Working Group, Curriculum Harmonization Advisory Committee, PQI Provincial Network). As illustrated in the table below, each health authority as well as representatives of various health partners were included in the interview sample. The target number for key informant interviews was between 40 and 50.

Table 1: Key Informants Interviewed by Health Authority		
Health Authority	Total	
Fraser Health Authority (FHA)	7	
Interior Health Authority (IHA)	12	

Health Authority	Total
Norther Health Authority (NHA)	10
Provincial Health Services Authority (PHSA)	2
Vancouver Costal Health (VCH)/	0
Providence Health Care (PHC)	0
Vancouver Island Health Authority (VIHA)	4
N/A	3
Total	46

• Survey of 27 PQI team members. A survey of PQI team members (staff) was conducted to gather their perspective on supports provided to physicians and impact of the PQI training and support provided. As demonstrated in the table below, a total of 27 PQI team members completed the surveys, accounting for about a third of PQI team members. Of those, over one-third were physician advisors/coaches or QI consultants, about a quarter are coordinators or work in administrative roles, and the rest are analysts. PQI team members from all health authorities participated in the survey.

Health Authority	Number	
FHA	3	
IHA	3	
NHA	3	
PHSA	2	
VCH/PHC	4	
VIHA	3	
Not Affiliated/Blank	9	
Total	27	

Table 2: PQI Team Member Surveyed by HA

Conducted 21 interviews as part of a review of 15 learning action projects. The case studies
involved a deep dive into 15 PQI learning action projects. Each health authority was asked to
identify 2 to 3 projects for review. The projects were selected to represent a range of health care
impacts including impacts on patient health outcomes, patient and physician experience, and
cost reduction. As part of the case studies, we conducted 21 interviews, of which 15 were with a
project lead physician, five were with PQI team members who supported the projects, and one
was with a patient partner involved in a project. The table below shows the number of physicians,
team members, and patient partners who were interviewed from each health authority.

Health Authority	Lead Physician	PQI Team Members	Patient Partners	Total
FHA	3	-	1	4
IHA	2	1	-	3
NHA	2	2	-	4
PHSA	2	1	-	3
VCH/PHC	3	1	-	4
VIHA	3	-	-	3
Total	15	5	1	21

#### Table 3: Total Case Study Participants Interviewed by Health Authority and Role

As noted earlier, the evaluation included a review of data collected by SSC on an annual basis and the PQI Alumni Survey conducted in 2020. More specifically, the data sources included:

- Annual Physician Pre- and Post- PQI Training Survey. The SSC conducts annual surveys of physicians pre and post PQI training. The surveys are designed to measure self-assessed improvement in knowledge, skills, confidence, leadership abilities and other outcomes.
- **PQI Physician Alumni Survey (2020).** The one-time Physician Alumni Survey was conducted by the SSC in 2020 to gather physicians' perspectives on the intermediate impacts of the PQI initiative including their ongoing engagement in QI, their preparedness to complete learning action projects, the impact of those projects, the extent to which project impacts were spread or sustained, and their perspective on PQI priorities, etc.

As demonstrated in the below table, a total of 309 physicians have participated in the pre-training survey, and 140 in the post-training survey. The survey of 76 PQI physician alumni was completed in 2020.

Health Authority	PQI Annual T (2017/18)	raining Survey to 2020/21)	PQI Alumni Survey (2020)	
	Pre	Post*		
FHA	100	49	21	
IHA	55	11	8	
NHA	-	15	0	
PHSA	35	11	11	
VCH/PHC	80	40	27	
VIHA	39 14		9	
Total	309	140	76	

#### Table 4: Pre-Post PQI Training Surveys and Alumni Survey

\*post-survey data from 2021 N/A

• Annual survey of steering committee members and PQI Staff. The SSC conducts an annual survey of members involved in steering committees and PQI Team members across the health authorities. The surveys are conducted to gather inputs from health partners regarding ongoing collaborations, relationships, PQI team member engagement, and the level of agreement on major aspects of program performance.

Survey Group:	Year			
	2018	2019	2020	2021
Steering Committee Members	53	67	65	52
PQI Team Survey	38	45	45	44
Total	91	112	110	96

#### Table 5: Steering Committee and PQI Staff Annual Survey

## EVALUATION CONSIDERATIONS AND LIMITATIONS

The evaluation methodology involved multiple lines of evidence, including both primary and secondary data sources, which added to the strengths of the evaluation findings. However, several data limitations should be noted:

- Most of the analysis is based on opinions (surveys, interviews) which introduce a potential for respondent bias. The evaluation relies heavily on opinions gathered through surveys and interviews of individuals who may have a vested interest and could be positively biased in their opinions. For example, the survey of PQI Physician Alumni and interviews with physicians as part of case studies are likely to be skewed toward those more likely to have had positive experiences with PQI. This challenge was partially addressed by using various data sources and various formats to collect information (annual surveys of physicians, one-time Physician Alumni Survey, and extensive interviews with physicians participating on steering committees and in learning action projects). Extensive interviews were also completed with representatives, Doctors of BC representatives, clinically active physicians, patients, and a few team members who worked with physicians on PQI learning action projects). This enabled us to include a wide range of perspectives in our analysis and mitigate potential participant bias.
- The projects selected for a case study review were not intended to be representative of the approximately 400 PQIs projects completed to date. The projects were selected by health authorities and intended to demonstrate the impact of the physician learning action projects in achieving outcomes. No attempt has been made, nor it is advisable, to extrapolate the results presented in this report to the entire population of PQI learning action projects completed to date.
- A project outcome assessment form was developed to help categorize projects reviewed as part of the case studies and assess the extent to which they achieved specific outcomes including patient participation, sustainability, and spread. Appendix 1 includes a summary of each project based on this assessment. It should be noted that this assessment was completed by the evaluators based on project documentation and interviews with project representatives. It has not been validated by the physicians or SSC.
- This evaluation was designed to assess the achievement of PQI outcomes as defined in the PQI logic model. While some assessment of the progress was made in relation to a number of recommendations from the previous evaluation (2018; summarized in Appendix 2), this evaluation was not designed to assess issues related to processes and structures.
- The evaluators did not confirm the validity and reliability of administrative data. For example, data on the number of participants in PQI training by year was collected and provided by each health authority.

## **1.4 STRUCTURE OF THE REPORT**

The report is organized into four chapters as follows:

- Chapter 2 provides a brief description of Doctors of BC and the SSC, overview of the Physician Quality Improvement initiative including the governance model, training and learning action projects, the logic model, and PQI expenditures.
- Chapter 3 summarizes major findings related to evaluation issues including the impact of the PQI initiative on collaboration and relationships, alignment of the PQI initiative with health authority priorities, the impact on strengthening QI culture and impacts related to the IHI Quadruple Aim, factors contributing to the success of PQI, and priorities and opportunities going forward.
- Chapter 4 outlines the major conclusions and recommendations of the PQI outcome evaluation.
- Appendices include a more detailed description of lessons learned and recommendations, short summaries of each case study's project findings.

# 2. DESCRIPTION OF THE PQI INITIATIVE

This chapter provides a brief description of the PQI initiative including its structure and governance, QI training and learning action projects, physicians participating to date in different training levels, PQI logic model, and expenditures.

## 2.1 DOCTORS OF BC

Doctors of BC is a voluntary association of about 14,000 physicians, residents, and medical students in British Columbia. The organization was established with the goal of promoting a social, economic, and apolitical climate that fosters the highest standard of health care for British Columbians, while achieving maximum professional satisfaction and fair economic reward for BC physicians. To achieve these goals, the organization focuses on:

- Advocating for doctors through negotiations, influencing health care system policy, and helping doctors navigate professional issues that impact their ability to provide a high standard of care.
- Providing services, supports, and benefits to improve doctors' professional experience and make a positive difference for patients.
- Collaborating with doctors and the health system to improve the quality of patient care.
- Engaging with doctors and assisting them to engage with the health care system in communities and facilities.
- Promoting an understanding of the doctors and the environment in which they work.

Doctors of BC has a dual governance structure, in which a 9-person Board oversees the activities and internal affairs of the Association and sets strategic direction policy, while a 106-member Representative Assembly provides wide-ranging representation from all geographic areas, family physicians and specialists, rural and First Nations communities, medical students, new practitioners, residents, and the Canadian Medical Association.

Doctors of BC has over 70 member-run committees dealing with a diverse range of issues such as policy development, physician health and well-being, continuing medical education, financial management of the association, and general health promotion.

#### JOINT COLLABORATIVE COMMITTEES

Joint Collaborative Committees (JCCs) were created as a unique partnership between Doctors of BC and the BC Government to support a shared goal of improving the BC health system by bringing together doctors, government authorities, health authorities, patients, families, and other stakeholders.

This partnership is governed by the Physician Master Agreement, grounded in the principles of quality improvement (QI), the methodologies of the Institute of Health Care Improvement, and is framed around the IHI Triple Aim.

There are four joint collaborative committees including:

- General Practice Services Committee (GPSC),
- Shared Care Committee (SCC),
- Specialist Services Committee, and
- Joint Standing Committee on Rural Issues (JSC).

The committees are mandated to drive health system improvement, innovation and transformation, and physician engagement. Each committee consists of several smaller working committees, initiatives, programs,

#### Chart 1: Joint Collaborative Committees



and policies that function together to achieve the goals outlined in their mandates.

The principles of the SSC are aligned with the IHI Triple Aim strategy (sometimes known as the IHI Quadruple Aim) which applies a three-pronged approach to improving healthcare services: 1) improve population health; 2) reduce per capita cost; and 3) improve patient and provider experience of care<sup>3</sup>.

Principles of Triple Aim Strategy <sup>4</sup>	Description
Improve Population Health	<ul> <li>Improve patient outcomes by improving the quality of health services.</li> <li>Create longitudinal, team-based care that is comprehensive and integrated with other health care professionals and services, with effective referral systems amongst them all.</li> <li>Encourage health professionals to work at the optimal scope of their practice within team-based care.</li> </ul>
Improve the Experience of Care for the Patient and Provider	<ul> <li>Improve access to and the experience of medical and health care services to patients, in all regions of the province, without sacrificing the quality of care.</li> <li>Embed cultural safety and humility for First Nations and Indigenous people in BC into the activities of the Joint Collaborative Committees in alignment with our commitments in the <i>Declaration of Commitment: Cultural Safety and Humility in Health Services Delivery for First Nations and Indigenous People in BC</i> and provide quality care in a manner that is culturally safe for all people.</li> <li>Protect clinical autonomy to provide science-based, evidence-informed health care.</li> <li>Engage physicians to work with each other, the health care system (including other health care professionals), and their communities to lead and/or support quality improvement and the spread of effective innovations.</li> </ul>

#### Table 6: Principles of the IHI Quadruple/Triple Aim Strategy

<sup>&</sup>lt;sup>3</sup> Doctors of BC Website: https://www.doctorsofbc.ca/sites/default/files/jcc\_principles.pdf

<sup>&</sup>lt;sup>4</sup> Doctors of BC Website: https://www.doctorsofbc.ca/sites/default/files/jcc\_principles.pdf

Principles of Triple Aim Strategy <sup>4</sup>	Description
	• Develop and support adaptive change to prepare the medical profession for the future.
Reduce the Per Capita Cost of Healthcare	<ul> <li>Develop a sustainable healthcare system.</li> <li>Provide value for money, including measurable savings and improvements.</li> </ul>

Source: Principles for the Joint Collaborative Committees

The Specialist Services Committee (SSC) was established in 2006 to facilitate collaboration between the provincial government and DoBC on the delivery of services by Specialist Physicians (Specialists) and to support the improvement of the specialist care system. The Committee improves patient care by engaging physicians in collaborating, leading quality improvement, and delivering quality services with SSC supports and incentives.

Physician engagement is at the core of the SSC's work. The SSC's approach to supporting physicians is divided into three areas, including direct engagement of physicians and health partners, the transformation of care delivery, and development of physician capability. Each area covers a range of initiatives and programs.

## 2.2 PQI INITIATIVE

The Physician Quality Improvement (PQI) initiative is one of the Physician Capability Initiatives developed in 2015 to engage frontline physicians by providing them with an opportunity to design quality improvement ideas, receive the needed training and resources to implement their ideas and to partner with their peers on their quality improvement (QI) projects.<sup>5</sup> The PQI initiative recognizes that physicians are highly trained and experts in providing medical care to individuals, but their training often lacks a focus on the processes and systems in which they work and which are important aspects of the quality of patient care.

It is important to remember that the PQI initiative, while aligned with the health authorities' overall strategy of quality improvement, is distinct from its Quality Assurance responsibility and mandate. Ultimately, the goal of PQI is to address gaps in quality structures and enhance the delivery of quality patient care by increasing physician involvement in the QI process. Both physicians and health authorities benefit from the process.

Physicians are supported and empowered to address gaps in healthcare and are increasingly involved in working

collaboratively with health authorities to bring about effective and sustainable systemic changes. The PQI initiative is based on values of trust, teamwork, service, joy of work, innovation, and courage to drive changes and challenges to the status quo.

Implementing the PQI initiative required each health authority and the SSC to work together to jointly develop a PQI plan. Physicians' input to custom design a program that meets the needs of their local health authority was an important component of the process. The process resulted in a Funding

<sup>&</sup>lt;sup>5</sup> SSC Website: https://sscbc.ca/sites/default/files/PQI%20Two-Pager%20%28ID%20236315%29\_0.pdf

Transfer Agreement enabling the SSC to transfer funding to individual health authorities who could then launch their initiatives.

The following chart illustrates the different steps in establishing PQI initiatives in each health authority<sup>6</sup>:



## GOVERNANCE MODEL

The overall governance and decision-making structure for the PQI initiative were established through a collaborative process between the SSC and health authorities. According to the PQI Operating Guidelines, some of the governing principles include:

- The SSC is an active partner within the PQI initiative and seeks continued health authority collaboration.
- The PQI is not a 'transactional relationship' regarding funding.
- Joint partnership is fully represented and acknowledged through branding in job descriptions, QI training events, and other external-facing documents.
- The ongoing management and growth of the PQI initiative is done jointly by the SSC and health authorities through participation in PQI joint steering committees, administration of the health authorities' PQI team positions, administration of physicians' compensation and delivering of the PQI training package.
- Working collaboratively with all PQI teams to further accelerate quality culture change and create synergies.

The structure of the overall governance of PQI is illustrated in the following chart.

<sup>&</sup>lt;sup>6</sup> PQI Provincial Evaluation Final Report, 2018, pg. 10.



**Chart 3: PQI Governance Structure** 

In 2020, SSC prioritized Spreading Quality Improvement (SQI) as a key initiative and provided financial resources and senior staff to move this initiative forward. The goal of the initiative is to spread successful SSC QI projects for the purpose of accelerating impact and transformation of the healthcare system within the Triple Aim framework.

The following table describes each component of the governance structure including their roles, composition, and decision making.

Group	Composition	Scope	Decision Making
SSC QI Working Group (previously PQI Working Group)	<ul><li>Government: 4</li><li>Doctors of BC: 4</li></ul>	<ul> <li>Governance and overall decision-making for the SSC PQI and SQI initiatives</li> <li>Policy, Funding, Direction</li> </ul>	<ul> <li>Collaborative consensus-based decision-making.</li> <li>Decisions that cannot be reached are escalated to the SSC.</li> </ul>
QI Central	<ul> <li>Provincial Physician Leads: 2</li> <li>SSC PQI Manager; SQI Liaison; Senior Analyst; Coordinator; Senior Administrative Assistant</li> </ul>	<ul> <li>Overall support and execution of the provincial work plan.</li> </ul>	<ul> <li>As defined by the SSC- QI Working Group.</li> </ul>
PQI Network	<ul> <li>Health Authority: PQI Sponsor</li> <li>PQI Steering Committee Chair</li> <li>Physician QI Advisor</li> <li>PQI Manager</li> <li>SSC reps &amp; PQI Central</li> </ul>	<ul> <li>Elements related to QI training, learning action projects, joint activities for PQI staff, spread, etc.</li> <li>Information sharing and collaboration.</li> </ul>	<ul> <li>Collaborative consensus-based processes.</li> </ul>

#### Table 7: PQI Governance Structure Composition, Scope, and Decision Making

Group	Composition	Scope	Decision Making
PQI/SQI Joint Steering Committees	<ul> <li>Patient Reps: 1 (min.)</li> <li>Clinically Active Physicians: 2 (min.)</li> <li>SSC Reps: 2 (min.)</li> <li>Health authority Reps: 2 (min.)</li> </ul>	<ul> <li>Oversee, execute, and establish guidelines for the implementation of health authority PQI Funding Proposals (and SQI Funding Proposals).</li> <li>Monitor and manage initiative resources, scope, and mitigate potential risks.</li> <li>Promote awareness within the health authority.</li> <li>Budget, training, selection of cohort.</li> </ul>	<ul> <li>Collaborative consensus-based decision-making.</li> <li>Decisions that cannot be reached are escalated to the SSC QI Working Group.</li> </ul>
Health Authority Teams	<ul> <li>Physician QI Advisor/Mentors/Coaches</li> <li>Manager</li> <li>Consultants/Coaches</li> <li>Data/Evaluation/Systems Analysts</li> <li>Coordinators/Administrative Assistants</li> </ul>	<ul> <li>Execution of the PQI steering committee activities.</li> </ul>	<ul> <li>Dyad role of PQI Manager and Physician QI Advisor.</li> <li>PQI staff follow the lead of the dyad.</li> </ul>
Operational Executive	<ul> <li>Health authority Sponsor</li> <li>PQI Steering Committee Chair</li> <li>SSC PQI Manager</li> </ul>	<ul> <li>Urgent time-sensitive requests brought forward by PQI dyad.</li> </ul>	<ul> <li>Decisions that cannot be reached are escalated to the QI working group.</li> </ul>

Source: SSC PQI Operating Guidelines Appendix C: Summary of Decision Making (October, 2020)

## **KEY COMPONENTS OF PQI**

There are four key components to implementing the PQI initiative and they include: establishing joint steering committees, hiring technical staff, providing QI training, and supporting learning action projects. The four key components of the PQI initiative are described in some detail below.

## JOINT STEERING COMMITTEE

The SSC/health authority joint steering committees report to the SSC-PQI/SQI working group and their respective health authority. The joint steering committees are responsible for:

- Executing directions, requests, and actions from the SSC and QIWG;
- Overseeing the implementation of the health authority PQI funding proposals, including balancing costs and their alignment with health authority and SSC QI strategies;
- Establishing guidelines, processes, and policies regarding funding, including selecting physicians who participate in QI training and projects and their physician QI advisors/mentors;
- Monitoring/managing the scope of the initiative, including delegating activities and mitigating potential political issues and risks;

• Promoting awareness of the initiative's activity within the health authority to encourage sustainability, spread, and coordination with related projects.

The following table shows that VIHA was the first to sign the proposal and establish a joint steering committee. Four health authorities followed suit in 2016, then IHA in 2018. Training in most health authorities started shortly after the steering committees were established. Currently, all but NHA have cohort-based training (i.e. the physicians progress through the scheduled training as a group (cohort) and graduate together upon completion). The NHA has a distributed model where physicians are allowed to reach out to QI coaches at any time to start QI training and QI project support.

	Health Authority					
	FHA	IHA	VIHA	NHA	PHSA	VCH/PHC
PQI Proposal Approval by SSC	Dec 2014	Jan 2017	Jan 2016	Sept 2016	Sept 2016	Jun 2016
First PQI Steering Committee Meeting	May 2016	Jan 2018	Mar 2016	Nov 2016	Nov 2016	Aug 2016
First Official Training Date	Apr 2015	~ Sept 2018	Nov 2016	~ Sept 2017	Dec 2017	Sept 2017
Type of Model	Cohort	Cohort	Cohort	Distributed	Cohort	Cohort
Most Recent Active Cohort <sup>7</sup>	Cohort 7	Cohort 4	Cohort 6	4 <sup>rd</sup> Year	Cohort 5	Cohort 5

#### Table 8: PQI Overview Snapshot

Source: PQI Provincial Evaluation Report 2018 and SSC PQI Annual Report

## TECHNICAL STAFF (PQI TEAMS) AND INFRASTRUCTURE

A critical aspect of the PQI initiative is ensuring that physicians have access to the supports necessary to not only complete the QI training programs, but also to successfully navigate their QI learning action projects. Each health authority recruited and trained PQI staff to provide QI coaching, technical, and other supports to participating physicians. The PQI support teams commonly include PQI managers, coordinators and administrative support, coaches, consultants, data analyst, evaluators and physician QI advisors. The PQI team provides supports to physicians undertaking learning action projects, including but not limited to the following:

- Helping physicians develop measurable objectives to address the problem at hand;
- Supporting design of the methods for the QI project, which may include identifying measures, determining data collection timelines and strategy, analyzing data, developing data dictionary and database design, creating an evaluation plan, etc.;
- Providing administrative and other supports depending on the type of the learning project.

## QI TRAINING

The QI training programs are a cornerstone of the PQI initiative. Training and supports provided to physicians focus on their needs and interests in conducting the quality improvement projects that aim to enhance the delivery and quality of patient care. While the training format and structure differ across the health authorities and levels of training, the foundational core of the training is based on

<sup>&</sup>lt;sup>7</sup> SSC Annual Report 2020, pg. 12

the IHI Model for Improvement which has been adapted for the BC PQI initiative. The PQI training structure typically includes participation in different training levels<sup>8</sup>:

- Level 1 Training involves participation in various modules available through IHI Open School such as introduction to health care improvement, testing and measuring changes, interpreting data, leading quality improvement, and planning for spread from local to system-wide change. Eligible participants have access to online courses offered by IHI and paid for by the PQI initiative as well as access to course discussion forums and a vast library of resources. In some regions, physicians can choose to attend in-person (or virtual) workshops as an alternative to IHI modules. These workshops or IHI training modules are sometimes prerequisites for Level 2 training.
- Level 2 Training involves facilitated in-person (currently virtual due to COVID-19) workshops over 1 to 2 days. Some regions offer more extensive intermediate QI workshops and webinars. Content may include QI project development, designing Plan-Do-Study-Act (PDSA) cycles, the importance of culture in QI, project ethics, , measurement skills, and stakeholder collaboration skills. The intermediate level may also include an applied QI Learning Action Project requirement through which participants begin the first stages of their QI project.
- Level 3 Training is an advanced training model intended to help physicians complete their learning action projects. The advanced training varies significantly across health authorities in terms of length, timing, delivery structure, etc. Most health authorities advanced training is structured around a cohort model, where physicians participate in workshops that can take up to 10 days spread over 8 months to a year. Advanced content covers a wide range of topics some of which include developing QI changes, variation and advanced data design, charts and data display, QI project implementation, project review, presentation skills, privacy and security, ethics, knowledge translation, sustaining and spreading improvement, and publishing QI work. Physicians receive a PQI certificate upon completion of advanced training and learning action projects.

## PQI LEARNING ACTION PROJECTS

The PQI learning action projects are commonly completed within a 12-month period while taking PQI advanced training which is intended to support physicians in undertaking these projects. The NHA has developed an innovative approach called the Virtual Action Learning Series to simultaneously support physicians to lead Quality Improvement projects and receive just-in-time virtual QI training focused on a shared topic of interest determined by engaging physicians and the health authority.

Learning projects are hands-on projects through which physicians can focus on a wide range of issues, as long as the project focus is endorsed by their local medical and administrative leadership, and it is aligned with the interests of the health authority and the PQI initiative. Although each health authority establishes its own criteria and priorities for QI projects, the operational guidelines outline the following eligibility criteria:

- A majority of the physicians participating in the PQI initiative should be specialists.
- Family physicians are eligible to participate.
- Non-physicians are to be considered, as long as no physician displacement occurs.

<sup>&</sup>lt;sup>8</sup> PQI Program Approaches (Excel, Provided by SSC)

• There is available capacity within the health authority and PQI support teams to support the project through to completion.

The physicians selected are provided full support and mentorship from PQI coaches, coordinators, and data analysts. They have access to data, QI resources, QI systems and project management tools, and their projects are endorsed by the health authority steering committee. They also receive sessional funding for their time. The process of applying to complete the level 3 training and learning action project may vary somewhat across the health authorities, but typically involves consultation with a Physician QI Advisor, submitting a project proposal (e.g. a brief description of the problem, the aim of the project, the project's alignment with the organizational goals, and timing), and a more detailed project charter describing project scope and team members, strategic alignment of the project with local facility or site, details of patients engagement, etc. The project proposals are then reviewed by the health authority steering committee and decisions are made based on several criteria which differ somewhat across health authorities, but may include alignment with the health authority's quality improvement goals, regional and speciality representation, funding available, etc. Physicians are expected to complete all required training, work in partnership with the health authority, keep their project sponsors aware of the progress made, and present the project results to their organizations and facilities.

#### DESCRIPTION OF LEARNING ACTION PROJECTS

The PQI initiative project database (The Exchange) recorded a total of 434 PQI learning action projects as of June 2021. Of those, 266 or 61% have been completed, 127 were in progress, 18 were temporarily on hold, and one was incomplete. Most projects have been undertaken by physicians in FHA (25%), followed by those in PHSA (21%) and VIHA (13%).

Status	FHA	IHA	VIHA	NHA	РНС	PHSA	VCH/PHC	Total	%
Completed	92	20	37	28	14	25	50	266	62%
In Progress	1	24	22	15	-	63	2	127	29%
Hold	14	-	-	4	-	-	-	18	4%
Incomplete	1	-	-	-	-	-	-	1	0%
Other	-	8	-	-	6	2	6	22	5%
Grand Total	108	52	59	47	20	90	58	424	100%
%	25%	12%	13%	11%	5%	21%	13%	454	100%

#### Table 9: PQI Learning Action Projects (as of June 2021)

Source: The Exchange Search: https://sscbc.ca/projects-directory

The projects undertaken can have one or more areas of impact. The following table illustrates the major areas of impact as identified in the database. Approximately half of the projects focused on improving efficiencies and effectiveness of processes, followed by acceptability and appropriateness (32%) and accessibility, equity, and safety (23%). Other areas of focus included engagement, collaboration and integration, innovation, and others.

#### Table 10: Major Areas of Impact

Areas of Impact	Count	Percent
Efficiency and Effectiveness	211	49%
Acceptability and Appropriateness	138	32%
Accessibility, Equity, and Safety	102	23%

Areas of Impact	Count	Percent
Engagement, Collaboration, and Integration	56	13%
Innovation and Quality Improvement	18	4%
Spread and Sustainability	6	1%
Other (Blank)	41	9%
Total PQI learning action projects434		

Source: The Exchange Search: https://sscbc.ca/projects-directory

The PQI learning action projects undertaken by physician span across wide range of medical areas or specialities. The following table a breakdown of the medical areas or speciality associated with projects undertaken as identified in the Exchange database.

Medical Area/Speciality	Count	Percent
General Practice, Family Practice, Family Medicine	73	17%
Emergency Medicine	47	11%
Hematology and Oncology, Radiation Oncology	28	7%
Internal Medicine	26	6%
Pediatrics	26	6%
Psychiatry	26	6%
Hospital Medicine	23	5%
Anesthesiology	22	5%
Obstetrics and Gynecology	20	5%
Critical Care Medicine	16	4%
Surgery and General Surgery	14	3%
Pathology	13	3%
Cardiology	11	3%
Gastroenterology	9	2%
Palliative Medicine	9	2%
Neurology	8	2%
Orthopedics	8	2%
Laboratory Medicine	6	1%
Community and Rural	6	1%
Geriatric Medicine	5	1%
Other (Nephrology, Rheumatology, Dermatology, Diagnostic Imaging, Endocrinology, etc.)	30	7%
Total Projects with Area of Speciality Identified	428	100%

Table 11: Learning Action Projects - Specialties

Source: SSC Website - The Exchange Database

The PQI initiative also provides opportunities for health leaders to travel to other regions and clinics and learn about best practices applied elsewhere that have been proven to increase the quality of health services. Through SSC's Physician Leadership Scholarship program, or funding provided by PQI directly, physicians are provided with opportunities to participate in conferences, summits, or workshops where they can share knowledge and lessons learned with others involved in QI. For example, the SSC supported a number of health leaders to visit the Mayo Clinic in Phoenix Arizona in 2017; organized the first PQI summit in Vancouver (2019) attended by more than 400 physicians, and key partners from BC health authorities and the MoH. In 2019, the SSC supported 147 physicians and PQI team members to attend the Institute of Healthcare Improvement's four-day annual conference held in Orlando, Florida.

#### DEFINING QUALITY OF CARE

The Institute for Healthcare Improvement defines the six dimensions of quality in health care as safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity.<sup>9</sup>

The following table describes in more detail each dimension of quality in health care.

Dimensions of Care	Description
Safety	<ul> <li>Avoiding harm to patients from the care that is intended to help them.</li> </ul>
Effectiveness	<ul> <li>Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit. Avoiding underuse and misuse of services.</li> </ul>
Patient- Centredness	<ul> <li>Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.</li> </ul>
Timeliness	<ul> <li>Reducing wait times and sometimes harmful delays for both those who receive and those who give care.</li> </ul>
Efficiency	<ul> <li>Avoiding waste, including waste of equipment, supplies, ideas, and energy.</li> </ul>
Equity	<ul> <li>Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.</li> </ul>

#### Table 12: Dimensions of Health Care Quality

## 2.3 PQI LOGIC MODEL

As previously discussed, the PQI initiative has multiple components and structures that are key to achieving its objectives. Each of these components (joint steering committee, PQI teams and infrastructure, physician training and projects, networking) result in a set of activities and outputs that are intended to achieve a number of immediate, intermediate, and long-term outcomes.

The immediate outcomes of the PQI initiative intend to increase physician capability in quality improvement and leadership, increase physician engagement, renew focus on the patient-centeredness perspective, improve relationships between physicians, health authorities, and the PQI steering committees, and establish structures and processes for physicians to complete QI learning action projects.

In the intermediate term the PQI initiative is expected to strengthen quality improvement culture, increase physician participation in QI and leadership, increase the patient centeredness perspective, increase collaboration between physicians and HAs, and between physicians and health authority quality structures.

Finally, in the long run, the PQI initiative is expected to contribute to improved population health, improved care provider and patient experience, and reduced per capita costs to the health care system.

<sup>&</sup>lt;sup>9</sup> Institute for Health Improvement; How we define quality in Health Care? Donald Berwick, CEO and President

## CHART 4: PQI LOGIC MODEL



## **2.4 EXPENDITURES**

The following table outlines the total PQI expenditure across health authorities over the last five years. About \$31.5 million have been invested in the PQI initiative (including operational funding, physician disbursements, and program expenditures).

Health Authority	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
FHA	\$331,777	\$910,938	\$1,843,653	\$2,154,702	\$2,029,549	\$1,962,952	\$9,233,571
VCH/PHC	\$1,400	\$198,923	\$832,636	\$1,202,995	\$1,696,441	\$1,706,524	\$5,638,919
NHA	\$1,965	\$202,604	\$997,277	\$1,185,739	\$1,121,674	\$1,088,301	\$4,597,560
VIHA	\$5,103	\$585,429	\$988,623	\$868,049	\$1,036,166	\$1,141,444	\$4,624,814
IHA	\$639	\$5,931	\$365,241	\$1,094,787	\$975,311	\$1,381,094	\$3,823,003
PHSA	\$0	\$3,258	\$538,068	\$885,328	\$856,012	\$794,154	\$3,076,820
Grand Total	\$340,884	\$1,907,083	\$5,565,498	\$7,391,600	\$7,715,153	\$8,493,539	\$31,413,757

Source: PQI Expenditures 2015/16 -2020/21

# **3. EVALUATION FINDINGS**

This chapter summarizes major findings related to evaluation questions including the impact of the PQI initiative on collaboration and relationships, alignment of the PQI initiative with health authority priorities, the impact on strengthening QI culture and impacts related to the quadruple aim. It also summarizes major factors contributing to the success of PQI and opportunities for improvement.

## **3.1 IMPROVED COLLABORATION AND RELATIONSHIPS**

The nature and structure of healthcare delivery in British Columbia created unique challenges for various health partners to work collaboratively and build trusted relationships. Most physicians operate as independent contractors within the operational constraints of their respective health authority structures and feel removed from critical decisions that affect their practices. Conversely, health authorities, receive their mandates from the Ministry of Health and often struggle to engage physicians in a more systemic way in the issues related to change management and quality improvement.

The evaluation found that the PQI initiative was able to overcome these challenges and create effective structures and processes to build collaboration and improve relationships. The following are the major findings regarding PQI impact on improving collaboration and relationships:

# The PQI governance structure and processes have created a collaborative environment, engaging major health care players who traditionally operated within siloed health care structures, to work together toward mutual goals.

According to most key informants interviewed, the PQI initiative has built the governance structure and operating environment based on principles of mutual interest, collaborative decision making, and best practices related to improvement science. Over time this has helped overcome some of the initial differences and misunderstandings of the constraints under which each party operates. The structures and processes that have contributed to collaborative decision making and improved relationships include:

• Involvement of major health players, including MOH, SSC, health authority representatives and physicians in various working groups and decision-making tables. The MOH representatives are involved in the QI Working Group and participate in the discussions regarding governance and overall decision-making relating to policies, funding and directions. This ensures that policies, frameworks, and priorities are set and well understood by all parties involved. Key informants agreed that a number of committees and working groups (e.g., joint steering committees, PQI provincial network, QI working group, curriculum harmonization advisory committee, etc.) created to govern and manage activities of PQI were critical in opening lines of communication and building effective collaboration. The working tables that do not have decision making authority (e.g., PQI provincial network), are also perceived to be effective in building partnerships and encouraging joint decision making. Overall key informants agreed that the meetings are generally planned effectively, run professionally, and key decisions are followed through and implemented, thus contributing to the effectiveness of the collaborative efforts.

- Health authority steering committee structure and vision. The steering committees play a major role in collaborative decision-making regarding day-to-day implementation of PQI. Across BC, health authority steering committees bring together many partners: nearly 30 health authority representatives and over 30 clinically active physicians; about 15 patient partners; and dozens of SSC representatives<sup>10</sup>. In an annual survey (2021), 93% of steering committee members (n=52) reported that their members subscribe to a common vision for PQI. Key informants reported that the steering committees, for the most part, function effectively, have the right people involved and are successful in managing PQI and addressing any emerging issues.
- Consensus-based decision making. Consensus decision making has created an effective and inclusive approach to decision making. The approach ensures members of the committees work hard to make sure everyone's voice is heard and that disagreements are worked through. In a 2021 survey, 79% of steering committee members (n=52) agreed or strongly agreed that the PQI steering committee makes decisions effectively.
- **PQI team members embedded within the health authority structures.** Key informants, particularly physicians, interviewed noted the importance of PQI team members' seamless integration in the health authority organizational structure, thus creating an important link between SSC, Health Authorities, and physicians. In an annual survey (2021), 85% of PQI team members (n=44) and 77% of steering committee members (n=52) reported that the relationship of PQI with the health authorities is largely positive. Physicians interviewed talked about the importance of the PQI team for the success of their projects, particularly in terms of their access to the right people within the health authority and access to data.

# The relationship between Health Authorities and physicians who participate in PQI has improved. Physician engagement with the issues related to QI has increased both at the decision-making tables as well as at their local organizations.

PQI is perceived as an important tool for building relationships by having all parties recognize the ways in which their interests align, particularly as they relate to the IHI Quadruple Aim strategy which is the core of the PQI initiative. The health authorities across BC recognize the importance of effectively engaging physicians in all aspects of quality improvement. According to key informants and physicians interviewed as part of the case studies, relationships have improved as a result of clinically active physicians' engagement at the steering committee level, and in other working groups where major decisions are made, as well as through PQI education and projects that provide them with an opportunity to drive change at the local level.

All parties involved reported that the PQI initiative has had a positive impact on HA-Physician relationships and physician engagement in QI. For example:

• Most steering committee members in their annual surveys agreed or strongly agreed that physician involvement in PQI learning action projects has positively impacted their engagement with health authorities and that physician involvement in HA-led quality improvement projects is likely to increase as a result of PQI. Physicians interviewed added

<sup>&</sup>lt;sup>10</sup> Note these are most recent numbers but they can change as some positions may not be filled.

that being involved in the steering committee and various working groups and participating in decision making regarding PQI is an important aspect of engagement and relationship building. They reported having better understanding of the issues and constraints health authorities face with respect to funding, accountability and other structural issues that may impact their decisions.



**Chart 5: Perceived Physician Engagement** 

• Physicians surveyed reported higher levels of engagement post-training with respect to their practice environment, their values and satisfaction with the organization where they work.





• Similarly, physicians interviewed as part of this evaluation reported that the PQI initiative provided them with more opportunities to engage with their respective health authorities, collaborate with others within their organization and beyond, and build relationships. Dyad partnerships between physicians and local or regional health authority representatives were

important to those completing the learning action projects. One physician interviewed as part of the case studies noted that she did not know many people in her organization prior to completing the PQI learning action project and wasn't aware that other physicians were doing similar work in their respective areas of practice. Physicians interviewed as part of the case studies consistently reported that PQI provided a meaningful avenue to identify opportunities for quality improvement and get engaged in making QI changes.

- Ongoing engagement of PQI physician alumni in various quality improvement activities. About half of PQI physician alumni reported ongoing engagement with PQI through conducting additional projects (50% participated in more than one project as a team member and 54% led or co-led additional projects).
- Nearly all (93%) PQI team members surveyed in 2021 (n=44) also reported that the PQI initiative is effective in increasing physician engagement with the health authority (site level and regional).

The key factors that resulted in increased engagement and improved relationships between health authorities and physicians include supports for physicians who are interested in PQI (financial, human resources, and other support from PQI team such as training, assist with technical questions or aspect of designing and implementing projects, data analytics), buy-in from the health authorities and the support from the local organization.

# The effectiveness of the PQI initiative in building collaborative relationships varies somewhat across the Health Authorities. It takes time to build trust and reduce barriers to collaboration.

Overall, most steering committee members surveyed and those interviewed agreed that their committee function effectively, and the collaboration and partnerships built between various partners are effective. As illustrated in the following chart, despite the last year decrease, 79% of members agree that relationship/collaborations are effective and 84% believe that their committee functions effectively. Similarly, 85% of PQI staff surveyed in 2021 (n=44) agreed or strongly agreed that PQI initiative's relationship with their respective health authority is positive.



#### Chart 7: Perceptions regarding Partnership, Collaboration and Committee Effectiveness

At the time of the evaluation, the level of trust and collaboration varied somewhat across health authorities. The past year has been particularly challenging, as many of the PQI activities moved online, and the traditional in-person engagement that is beneficial for reaching consensus on specific or more contentious issues has been limited.

The effectiveness of the steering committees appears to be related to the personalities involved, turn-over among the members, and the emerging issues that need to be addressed. For example, in some health authorities the major topics of discussion include strategic decisions around governance, funding allocation, and alignment of PQI with the health authority's priorities. Some issues are more challenging to resolve. PQI staff noted that the current state of the working relationship at the steering committee is somewhat effective. The issue of standardization of

*"It takes time to build trust." "Health authorities' buy-in and leadership matters."* 

Key Informant Interviews (2020)

processes vs. flexibility required by health authorities to adjust to their needs and challenges can be contentious. There are significant differences across health authorities, including demand for PQI support, geographical differences, population, priorities, capabilities, operational concerns, etc. This requires the approach to PQI design and delivery to be flexible, although many key informants interviewed do recognize the need for the standardization of processes and structures.

## A majority of physician led projects are well-aligned with the broader priorities of Health Authorities. Project selection criteria and communication of health authorities' changing priorities is critical for ensuring future alignment.

All health authorities develop a range of specific priorities and objectives that are based on the mandate given to them by the BC Ministry of Health. Those priorities are generally communicated through annual service plans and other communication mechanisms (e.g., newsletters, mailouts, working group and committee meetings, internal news, website, etc.) to staff members and physicians.

A majority of key informants interviewed reported that learning action projects are generally well aligned with the health authority priorities, when the projects are well-defined and are intended to improve patient care or reduce costs. However, some key informants noted that the health authority priorities tend to be broad, and the issue of alignment is largely about the sustainability of the project, and resource requirements for implementation (although a few noted that mental health may be given priority due to the Ministry of Health's explicit priority regarding improving mental health outcomes).

As illustrated in the following chart, steering committee members who participated in the annual survey generally agreed that the PQI learning action projects are aligned with the priorities of their health authority, although the level of agreement has dropped somewhat since 2020.



Chart 8: PQI Learning Action Projects Alignment with Health Authority Priorities

The challenges regarding alignment noted by key informants include:

- **Broadly set priorities.** This means that any proposed project aiming to improve patient care could be considered in alignment. One key informant suggested that any project can fit into a priority of improving patient care; however, the local organizations bear the cost and responsibility to implement and sustain the projects. The alignment of the PQI learning action projects with the local organizational priorities and organization capacity to support it, is particularly important for QI sustainability. Therefore, it is important to engage a strong, knowledgeable, and engaged health authority sponsor and/or local manager early in the process to help design a realistic and sustainable project.
- The awareness of health authority priorities among physicians is not very high. About 50% of Physician Alumni surveyed in 2020 (n=50) reported that they were unsure if their projects align with their health authority's priorities and 66% rated it as 'high priority' for PQI alumni to know more about how health authority priorities are set and how to influence this process.
- Assessment of PQI learning action projects alignment with health authority priorities. Although multiple criteria are used for project selection (physician's skills, qualities, motivation and leadership potential, diversity of target population such as Indigenous, minority groups, etc.), the alignment of the project with the health authority quality improvement goals, can be most contentious. This is particularly challenging in some health authorities, where the steering committee members must make a decision to decline a number of physicians or place them on a growing waiting list due to high demand. In this case, the members are asked to provide recommendations and rationale for the projects that should take a priority for receiving PQI support. This process can be challenging, as physicians, health authority and local organization representatives, and patients may have conflicting opinions regarding the type of project that should be selected. Some key informants interviewed felt that a project's alignment with the health authority priorities is occasionally used to justify projects that are limited in scope and more likely to be focused on cost reduction rather than other areas of quadruple aim.

Managing increasing demand for the program, transparency of decision-making regarding project selection, and communication regarding governance and accountability will be key for sustaining effectiveness of steering committees, and future relationships.

While the collaboration and relationships between health authorities and physicians continues to improve, there has been a slight decrease in perceived effectiveness of PQI in a few areas. For example, among steering committee members the agreement regarding effectiveness of partnership and collaboration between SSC, health authority and physicians, dropped by 16% in 2021 compared to 2020, the alignment of PQI learning action projects with health authority priorities dropped by 13% compared to the 2019 levels, and perception regarding PQI leveraging of health authority resources dropped by 8%. The slight drop in ratings is not necessarily a reflection of any structural or operational concerns; as noted earlier, 2020 was a challenging year due to the pandemic, and the ratings in the previous year were quite high (over 80% among steering committee members). The ratings are likely indications of emerging issues, challenges, and discussions relating to managing growth, allocation of funding, project selection, and developing metrics to demonstrate the value of PQI.

The interviews conducted shed some light on the potential risks to sustaining effective collaborations and strong relationships between PQI, health authorities, and physicians, which are as follows:

- Ability to meet demand of the program and adequately support physicians. At this time, three health authorities reported that the demand for PQI education and project support outpace their capacity. Many health authorities reported that their marketing activities are limited to word of mouth, PQI networking and peer recruitment, PQI champions and annual email or newsletter distribution. They do not see a need for increasing marketing efforts given the increasing interest and demand. Representatives from a few health authorities noted that they have created waitlists for level 3 training and learning action projects support, and only about 50% to 60% of the qualified applications are currently being accepted. Other health authorities are able to meet the demand but are cautious with marketing efforts due to concerns about their ability to meet increase in demand. The surveyed PQI team members reported that, on average, they supported 16 physicians undertaking the PQI level 3 training and a learning action project in 2020. This ranged from about half (50%, n=14) of the PQI staff members reporting that they supported less than 25 physicians in 2020, 36% indicated that they supported 25 to 50 physicians and 14% supported more than 50 physicians. Given the importance of the adequate PQI support for physician engagement and satisfaction with the PQI initiative, the increasing demand will put additional pressure on resources, which may result in the erosion of the support, or need for more structured consideration and deliberation about which projects are accepted, and which are rejected or placed on a waiting list. Making such decisions without clear, consistent, and agreed upon guidelines and structures can create contention among the steering committee members.
- **Misalignment of PQI learning action projects with the health authority priorities.** One strategy that has been used to deal with the high demand is selecting PQI learning action projects that are well aligned with the health authority priorities. The health authority may decide to reject certain types of proposed PQI learning action projects or areas of interest that are deemed not to be in alignment with their immediate priorities or projects that may require additional resources from the health authority or local organizations to sustain. This
can create conflict with physicians who are passionate about their specific projects or areas of interest and who may have limited understanding of the health authority priorities and the rationale for their project proposals being rejected, not supported, or sustained. PQI learning action project alignment is discussed in more detail in the next section. However, it is important to note that appropriate alignment and communication of the project selection criteria is an important aspect of preserving trust and good relationships between health authority and physicians.

- Ongoing engagement and managing expectations of alumni. Many key informants noted that ongoing engagement with physicians who participated in PQI education and those who completed projects will be important for PQI future success. Key informants noted that without ongoing engagement with PQI alumni, physician involvement in quality improvement activities will decrease and the broader impact of PQI on the health system will not be sustained. At the same time, some key informants warned that physicians participating in PQI may have unrealistic expectations regarding the leadership positions, the ability to scale and spread their projects, and the ongoing support they may require to continue to engage in QI.
- Governance and flexibility of funding allocation. As PQI continues to evolve, and demands on
  resources increase, transparency related to funding decisions and communication about
  such decisions will be crucial for continuing collaborative relationships between PQI and
  health authorities. There have been some discussions around the funding (e.g., what
  activities get funded, how the funds are distributed across health authorities, flexibility of the
  funding, etc.). Key informants noted that some differences between the SSC and health
  authorities with respect to funding decisions have emerged such as competing priorities of
  increasing physician engagement in PQI and ensuring that quality improvement is
  sustainable with respect to additional resources that may be required from the health
  authorities.

### 3.2 PQI IMPACTS

### **3.2.1 STRENGTHENING QI CULTURE**

The following section outlines the evaluation findings with respect to the impacts of PQI in strengthening QI culture within the physician community. QI culture is promoted through the development of knowledge and skills, including leadership skills and opportunities, encouraging a patient-centric approach to quality improvement, and ensuring sustainability and spread of the successful quality improvement changes.

The evaluation findings with respect to strengthening QI culture are as follows:

Physicians participating in PQI training reported a significant increase in knowledge, confidence, and ability to lead quality improvement projects and initiatives. Physicians are likely to apply their new skills, capacity, and preparedness in their workplace.

Since 2017/18, nearly 1,600 general practitioners, specialists, residents, fellows and other medical staff (about 2%) participated in Level 2 and Level 3 training. Physicians from a wide range of

specialties participate in the PQI training, with family medicine and emergency medicine accounting for nearly one third of all participants.

Year	Training Level 2	Training Level 3	Total
2021/2022 *	56	140	196
2020/2021	148	109	257
2019/2020	187	44	231
2018/2019	259	40	299
2017/2018	174	37	211
Unknown	208	179	387
Total	1,032	549	1,581

#### Table 14: Number of Participants Trained by Year

Source: SSC Training Database \*as of July 2021

Teaching physicians about quality improvement models, strategies and techniques (e.g., Plan-Do-Study-Act cycle), data collection and demonstration of impact of changes achieved (e.g., client feedback) is the primary objective of PQI training. By designing and implementing learning action projects, physicians are given an opportunity to apply QI skills gained to address issues or problems they identified in their practice or areas of interest.

The physicians participating in the PQI training have consistently reported a significant increase in knowledge and skills related to quality improvement, the confidence to carry out and lead QI projects and activities, and an increased likelihood to be involved in leadership activities at their place of work. The chart below illustrates the change in the self-assessment of knowledge, skills, competence and confidence in conducting and leading QI related projects and activities.



### Chart 9: Participating Physicians' Self-Assessment of Increased Skills

Over 80% of physicians surveyed post-training reported that PQI has provided them with necessary tools, infrastructure, and skills to lead QI projects, and about 90% reported that they have already or will be able to apply what they learned in PQI in their work. Physicians participating in the interviews confirmed that they had very little knowledge of QI terminology, processes, methodologies, and how to measure improvements prior to participating in PQI training. A few physicians talked about wanting to make a change, to improve care for their patients, and make the processes and approaches more effective and efficient but were not sure how to go about it, or how to get others involved. The PQI training and education provided them with language, skills, and processes as well as dedicated time and resources to take on some of these issues. Physicians talked about learning specific skills (developing project charts, data analysis, structuring questionnaires, etc.) necessary to do things right and to create a sustainable change in their practice.

Most (84%, n=52) of the surveyed steering committee members in 2021, reported that PQI has increased physicians' QI capabilities. Steering committee members interviewed talked about the success of PQI in building a QI community (networking opportunities, alumni relationships, learning from others), and building QI vocabulary among physicians who are more likely to engage with quality improvement because they have a better understanding of it. A few key informants talked about the increasing interest among physicians and other health providers in issues related to QI.

About a third of those interviewed reported that the main strength of the PQI initiative is the tools, resources, and training that helps physicians to think about quality improvement in a more systemic way, providing them with tools and skills to design and implement the projects and demonstrate the impact and improvements achieved. Some key informants noted that physicians and other medical professionals are often reluctant to undertake innovative initiatives or projects because they may be perceived as risky or challenging. PQI created an environment where physicians are encouraged to innovate, while supported with the necessary tools and resources to succeed and create a sustainable change.

# The PQI initiative has encouraged a patient-centric approach to quality improvement by engaging patient partners at decision-making tables (steering committees), and prioritizing PQI learning action projects that involve patients. Not all projects are suitable for patient involvement.

Key informants agreed that the PQI initiative strives to develop a quality improvement culture that is patient centric, championing patient voices and encouraging their engagement in decision making tables, the PQI curriculum, and PQI learning projects. Representatives from most health authorities

reported that the patient partners participating in the steering committee are very involved and are effective champions of the patient voice and perspective. The health authority representatives confirmed the importance of patient input, with a particular focus on Indigenous and minority groups. Key informants emphasized an important role that PQI played in helping to shift the health system towards a patient-centered culture. As a result, patients have become an integral part of quality improvement and healthcare delivery in many health authorities across BC.

*"Our patient partners are amazing; they have admin and project management backgrounds. Highly involved in selection and development of projects"* 

*"Heavily involved in coaching, mentoring, teaching, shaping projects."* 

(Key Informant Interview, 2020)

Similarly, 75% of steering committee members surveyed in 2020 (n=65) and in 2021 (n=52) reported that patient voices are heard and positively impact steering committee work. Almost all patient partners who were interviewed also reported that the other steering committee members are seeking their input and feel that their perspective is always considered.

However, a few patient partners noted that their voices are not substantially considered when decisions were made, particularly around project selection, and prioritizing projects that engage with patient or families. Conversely, a few key informants suggested that some patient partners are more effective than others in communicating their views and providing feedback, and understanding how the system works, constraints around privacy, and challenges with engaging patients in certain projects. It was suggested that a limit to patient partners' tenure on the steering committee may be useful to provide opportunities for fresh perspectives.

Patients are often involved in the design or implementation of the learning action projects. More than half of PQI alumni surveyed reported that patients are at the centre of QI initiatives in their health authority and over 40% reported including patients in the design of PQI learning action projects. Over 80% of the PQI team surveyed as part of this evaluation who are involved in the physician led projects, noted that less than half of the projects include a structured patient input (nearly half said that less than 25% of the projects they work on include patient input).



#### Chart 10: Patient Involvement in QI Initiatives

Half of the learning action projects reviewed as part of this evaluation involved patients in designing, implementing, or measuring the impact of the projects (e.g., patient experiences). Out of 15 projects reviewed, a total of 7 explicitly involved patients in at least one stage of the project (3 projects involved patients in all project stages – design, implementation, and outcome measurement). As illustrated in the following table, patients were involved in various ways.

#### Table 15: Patient Involvement

Project Stage	# of projects	Examples
Project Design	5	<ul> <li>Survey of patients to determine their level of understanding of medical content discussed (Interpreter on Wheels).</li> <li>Brainstorm ideas to improve patient experience during Magnetic Resonance Imaging (MRI) test.</li> <li>Engaged with patients to inform development of the process/strategies to improve access.</li> <li>Patient feedback was collected to set the baseline.</li> <li>Including a patient partner in project design meetings, incorporated feedback from patient partners.</li> </ul>

Project Stage	# of projects	Examples
Project Implementation	7	<ul> <li>Implemented education sessions for families, discussed goals of care with families.</li> <li>Patients are part of the process (consultations, involved in treatment, indirectly involved in measuring effectiveness of treatment).</li> <li>Patients helped to develop questionnaires and provided feedback.</li> <li>Patients given a card with information for clinicians and physicians about proper treatment processes.</li> </ul>
Measuring Patient Experience	5	<ul> <li>Satisfaction surveys/interviews.</li> <li>Patient attendance benchmarks.</li> <li>Patient experience was collected via informal feedback.</li> <li>Positive patient stories, videos, and quotes were collected to demonstrate their experience.</li> </ul>

Many physicians do not believe that patients must be involved in every PQI learning action project. While nearly all physicians agree that PQI learning action projects should be designed with the primary purpose of helping to address an issue of importance for patients (91% of physicians agreed), only 27% of PQI alumni (n= 48) indicated that ensuring patient participation in every project should be of high priority for PQI.

Case study participants agreed. Physicians reported that some projects do not require patient participation because their primary goal is to improve internal structures and processes that are outside patient purview. For example, the project that was designed to reduce unnecessary preoperative procedures used internal hospital data to change protocols and guidelines and develop the tracking dashboard. In this example, patient experience was improved by reducing unnecessary trips to the hospital, however, it is difficult to measure patient satisfaction with something that did not previously exist.

There was some disagreement among key informants interviewed about the importance of and the extent to which PQI should focus on patient involvement in most projects. Some key informants agreed that not all PQI learning action projects require patient engagement, particularly those that aim to improve system efficiency or internal procedures that have no direct link to patient experience. Others suggested that more efforts should be made to seek patient input and to formally measure their experience. Those key informants argued that there are many benefits of increased involvement of patients in healthcare delivery. Some of these benefits include identifying the critical challenges that patients face in navigating the system, bringing to attention the issues that are often overlooked by healthcare providers, and creating more collaborative environments.

# Quality improvement culture and learning action projects are likely to be sustained at the physicians' place of work, especially if other health providers and local administrators were involved.

Physicians who participate in PQI training and physician led projects are likely to continue to promote quality improvement within their organizations and get involved in other quality improvement activities and initiatives, thus promoting QI culture and its approach to creating a change within their area of expertise. As illustrated in the following chart, 75% of PQI alumni who were surveyed reported that QI work had become part of their career, 61% reported that they know about current QI projects at their workplace and 42% continue to interact and engage with other PQI alumni.



### Chart 11: Ongoing Engagement of Physicians in QI

Physicians who continue to be involved are considered PQI champions and leaders in the field. Analysis of about 400 physicians that have completed a PQI learning action project show that an estimated 14% completed more than one PQI learning action project. Of physicians who participated in the case studies, nearly half participated in 3 or more PQI learning action projects, a few participated in dozens of projects as co-leads, mentors, and advisors.

All physicians who were interviewed as part of the case studies reported that their projects were fully or partially sustained in their organizations. For example:

- 6 projects created new protocols, procedures, dashboards, or standards that continue to be used and followed;
- 3 projects changed a standard operating procedure that continue to be used;
- 3 projects resulted in ongoing application of better, more effective treatment for patients;
- 2 projects continue to provide training and education for health staff about better and more effective treatments;
- 3 projects optimized patient testing efficiency;
- 1 project added new technology to improve patient communication; and
- 1 project created new programs to improve physician follow-ups

According to the physicians interviewed, the sustainability of quality improvement changes depends on the extent to which there is buy-in from local management, support from the health authority sponsor, engagement of the broader health team in the projects, and effective communication of the benefits of the change for patients, organizations, and health providers. PQI staff members mentioned that when the projects are over, it is easy to lose momentum and energy. Sustaining learning action projects should be a key part of PQI training and project planning. Staff members also noted that involvement of operational partners (e.g., operational manager) and ongoing guidance and support from PQI team members, particularly with respect to further data access and analysis, contributed to sustainability of quality improvement achieved by learning action projects. The PQI initiative has implemented various strategies to share the knowledge and successes achieved through PQI learning action projects. Scaling and implementing quality improvement across health institutions and across health authorities is more challenging.

Key informants interviewed shared numerous strategies and ways in which key lessons from PQI learning action projects have been documented, reported, and shared. The most common method of spreading information on PQI learning action projects is through presentations by alumni at graduation ceremonies. Upon completing their projects, many physicians create a story board and present the key outcomes of their projects. Graduates from other health authorities and other physicians, health stakeholders and CEOs of health institutions, attend these ceremonies to learn about what others are doing leading to several collaborative initiatives. Information about the projects is also communicated through quality improvement or physician newsletters, magazines, or annual reports that highlight selected PQI learning action projects. Some health authorities have undertaken initiatives to publish storyboard booklets, newsletters, reports, or journals dedicated to PQI learning action projects implemented by physicians (e.g., Fraser Health, Northern Health, Interior Health etc.). Occasionally, physicians document the results of their projects and write articles which get published in scientific and/or professional journals and magazines.

Physicians also present information about their projects in a wide range of professional meetings, conferences, and forums (e.g., quality forums, quality improvement clinics and various committees within each health authority, PQI steering committee meetings, meetings of BC Patient Safety and Quality Council, departmental meetings at hospitals, etc.). During their training, physicians are encouraged to make presentations at their local departments or workplaces and spread the information about their projects with their colleagues.

Short descriptions of all PQI learning action projects have been documented and included in a database on the SSC website (known as The Exchange), which provides information on project title and summary, status, areas of impact, and the name of the physician in charge of the project. Visitors to the website can search or scroll through the database to find projects in their field or area of interest and identify physicians who have overseen projects. Similarly, some information about the PQI program is available on health authority websites.

About half of the physicians surveyed (54% of physician alumni) and half of those interviewed as part of the case studies reported that the improvements achieved through their learning action projects have spread or have been implemented in other settings. Of the projects reviewed, most have spread within their organizations/other departments (7/15), within the health authority (6/15), and a few have spread across multiple health authorities (2/15). Other physicians reported that they undertook their projects to improve the processes and procedures in their local setting and were doubtful that the changes achieved are needed in other settings (the issue was believed to be unique to their work setting) or could be easily implemented in other organizations. The projects that were most successful in scaling and being adopted by others were the ones that were most relevant to other settings or areas of specialization (e.g. ER protocols may be similar across the health authority, while not many MRIs are taken in other hospitals, or language barriers are less of an issue in other regions); projects that are not too costly to implement (e.g. implementing new technology or tools could be prohibitive for some organizations); and projects that had substantial support from the health authority and the local administration (e.g. in one case it was the local administrative leaders that engaged with their colleagues in other locations and shared the findings). Supporting sustainability and spread of the quality improvements achieved via learning action projects is outside of the PQI scope; however, it is the main topic of discussion across all PQI health authority steering committees via the new SSC Spreading Quality Improvement initiative. Most steering committee members reported that sustainability and spread is an important aspect of ongoing engagement with physicians and the broader impact of the PQI initiative.

The evaluation found that just over half (52%) of physician alumni surveyed reported that they feel the PQI initiative prepared them well for sustaining and spreading the QI knowledge and improvements achieved. In the surveys and interviews, physicians and key informants identified the following challenges:

- Lack of time and resources. 56% of Physician alumni (n=48) reported that the lack of time and resources is a major challenge to spreading the PQI learning action projects. It takes significant time and effort to identify the right individuals, communicate the success of quality improvement efforts, and engage with a broader range of professionals to facilitate change in other organizations. Additional investments are often required to support the spread of QI.
- Limited support and advocacy from health authority and PQI. 47% (n=32) reported that limited support is a major challenge to creating a broader impact of PQI learning action projects. Although physicians receive sufficient support and training to implement the projects while enrolled in the program, support is mostly lacking after they graduate. Some health authorities have recognized this as a barrier and have increased their support for projects that could be implemented and/or expanded into new areas, operations, facilities, or regions.
- Limited planning for spread at earlier stages of project implementation. Most PQI staff (73%, n=22) reported that less than half of the projects they work on have established clear strategies to sustain or spread the learnings from the project. Some suggested that it is challenging to spread projects over multiple sites without a plan that is endorsed and actively supported by leadership. A few key informants also reported that projects without an explicit plan that includes sustainability and spread as key outcomes can be difficult for lead physicians and their teams to implement at a later date. Some health authority steering committees are now considering potential for spread and sustainability as a key aspect of project selection.
- **Systemic barriers.** Some key informants and physicians talked about the systemic barriers to spread including differences in how data is collected across organizations or health authorities, specific protocols and procedures, unique circumstances/locations (geographical remoteness, target group, etc.). Some key informants noted that some projects are very challenging to implement into the fabric of other organizations/health systems (e.g., creating and operationalizing new policies and procedures etc.) because they often require a specific skill set (e.g., change management), buy-in from all staff and backing by the health authority.

All key informants agreed that a more systemic approach is needed to support the spread and implementation of successful quality improvement activities. They recognized that in the initial phases of PQI development there was a limited strategic focus and systemic approach to spread. The key priorities were to demonstrate value and effectiveness of the PQI approach. It is only recently that the discussion around the broader impact of the PQI learning action projects and spread emerged, in conjunction with the new SQI work. There are numerous discussions underway focused on establishing structures of a systemic approach to ensure the sustainability and spread of PQI learning action projects, including the types of ongoing support that may be needed (e.g., coaching, access to data, etc.), additional resources, involvement of other health professionals such as nurses and administrators, building their skills related to project management/coordination, and backing and facilitating engagement and support from the health authority leadership.

### 3.2.2 IMPACT ON QUADRUPLE AIM

The following section summarizes the findings of the evaluation related to the PQI initiative's impact with respect to achieving the quadruple aim: impact on patient health outcomes and their experience with health care system, impact on physician experience, and impact on reducing cost to the health care system.

The examples of impact presented here are largely based on the 15 projects reviewed as part of this evaluation. Since inception of the PQI initiative there have been more than 400 PQI learning action projects completed. Although it is difficult to extrapolate the findings from case studies for the entirety of projects completed, the analysis provided below may be used as a blueprint for future categorization of projects and ways of demonstrating an impact. Appendix 1 includes a summary of impacts for each project reviewed.

### IMPACT ON PATIENT HEALTH OUTCOMES

# PQI has a significant impact on improving patient health by improving effectiveness of diagnostic measures and treatments, increasing access and timeliness of care.

Key informants noted that improving patient health outcomes is a priority for most physicians and is a core principle and focus of both PQI training and PQI learning action projects. Of the 15 projects reviewed as part of the case studies, 80% had been specifically designed with an objective to improve patient health outcomes. The following table provides a summary of the projects reviewed that had a direct impact on patient health outcomes by improving care (e.g., improved effectiveness of diagnostics, increased effectiveness of treatment, improved access to care, and improved timeliness of care provided).

Improved health outcomes	Number of Projects	Examples
Improved effectiveness of diagnostics	4	<ul> <li>Better communication with patients can lead to more reliable diagnosis.</li> <li>Increased rates of correct treatment from less than 50% to 100%.</li> <li>De-labelling patients with a penicillin allergy status who do not truly have an allergy. Allows them to use most effective antibiotics.</li> </ul>

### Table 16: Summary of Improved Health Outcomes

Improved health outcomes	Number of Projects	Examples
		<ul> <li>Ensuring patients are given the right type of testing to determine their treatment options.</li> </ul>
Improved effectiveness of treatment	8	<ul> <li>Increasing awareness of the most appropriate care for opioid addiction itself, versus treating the side-effects of addiction.</li> <li>Quadrupling of number of prescriptions issued for alcohol use disorder treatment means more patients are getting the best care possible, rather than being treated for side-effects of alcohol use.</li> <li>92% of women received "standard of care" in the most appropriate setting when facing early pregnancy loss.</li> </ul>
Improved access to care	5	<ul> <li>Increasing access to treatment by having more physicians talk to their patients about the opioid substitution therapy and prescribe it</li> <li>Improved patient access to interpretation for over 200 languages (including sign language) 24/7.</li> <li>Promoted point of care testing that can be done at a patient's bedside.</li> </ul>
Improved timeliness of care	3	<ul> <li>Patients can get more timely treatment when physicians can accurately read imaging scans.</li> <li>Reducing time to treatment from 6 hours to 2 hours, in line with international standards.</li> <li>Reducing echocardiogram rebooking rate from 48% to 33%, meaning outpatient tests can occur more quickly.</li> </ul>

Three of the projects have had direct impacts on saving lives:

- The Febrile Neutropenia project has reduced the number of deaths occurring due to curative intent (death from treatment) from 4 deaths a year to 0 by changing the protocols and procedures for triaging chemotherapy patients presenting at the ER with reduced white blood cell counts (a potentially life-threatening event for chemotherapy patients with suppressed immune systems). Patients are directly involved in ensuring they get the best care by carrying the red card, which alerts ER physicians of their condition, and the pre-printed order system created through the project. Since the implementation of the project, not a single patient has died from complications of Febrile Neutropenia at the physician's local ER. This project is currently being sustained and has spread throughout the health authority to 13 other ERs.
- Opioid substitution therapy is believed to have potential lifesaving impact by proactively treating addiction in a timely manner when patients are ready to accept it. Canada has one of the highest incidence rates of opioid addiction per capita, but ERs have historically focused on treating the complications of opioid abuse, rather than the addiction itself. The project aimed to change the culture of emergency rooms to view opioid addiction as a chronic illness that can be treated using opioid substitution therapy medication Suboxone and to immediately refer them to addictions treatment and counselling. Additionally, opioid substitution therapy protects patients from the symptoms of withdrawal while they are in the ER, leading to better patient and physician experiences. By the end of the project there had been over 153 referrals from ERs to addictions treatment and the project has improved the quality of life for many patients who are stabilized, more productive, and more engaged with their families and friends after receiving treatment.

The Alcohol Use Disorder (AUD) Treatment project has lifesaving and life-changing impacts. By improving the awareness of AUD treatment and destigmatizing the way that physicians and clinicians view AUD, patients are more likely to be prescribed life-saving medicine. This project was able to increase the mean number of Naltrexone (AUD treatment medicine) prescriptions in community pharmacies from 1.24 per 10,000 population to 2.96, 4.58, and 5.95 after each Continuing Medical Education (CME) event where the lead physician presented the findings. Providing better education to physicians can improve patient care and health outcomes and save lives. This project is currently being sustained and spread through word of mouth and presentations delivered by the lead physician.

### IMPACT ON PATIENT EXPERIENCE

#### Most quality improvement efforts improve patient experience, directly or indirectly.

All key informants agreed that most quality improvement changes that are patient-centric improve patient experience either directly (specifically designed to improve patient experience) or indirectly (by eliminating unnecessary procedures, trips to hospital, improving standard of care, reducing wait time, etc.). Physicians interviewed tend to agree that most quality improvement does in some way improve patients' experience, although patients may not be fully aware of that.

A review of 15 case study projects shows that over 80% of projects were perceived to have improved patient experience. Of those about one third had explicitly set out to impact patient experience and measured the impact through implementing patient surveys or collecting patient feedback. The following table summarizes the projects that had measured patient experience.

Project	Measurement
Interpreter on Wheels	<ul> <li>High patient satisfaction with the technology (4.4 satisfaction rate out of 5-point scale, n=169)</li> </ul>
Creating Quality MRI	<ul> <li>Improved overall patient experience from 86% to 91% of those who rated their experience as positive or very positive, reduced negative outliers (only one patient was not satisfied with experience)</li> </ul>
Quality Endoscopy Program	<ul> <li>100% of patients satisfied with virtual visits, improved follow-up rates by 50%</li> </ul>
Early Pregnancy Loss	<ul> <li>Received positive feedback from patient collaborators</li> </ul>
Decreasing the Distress in Patients with Delirium	<ul> <li>Decreased the distress experienced by patients/caregiver by 30%</li> </ul>

#### Table 17: Summary of Projects That Measured Patient Experience

Patients reported having improved experiences due to their involvement with PQI learning action projects or the implementation of PQI learning action projects:

• A patient before implementation of the Early Pregnancy Loss project: "*I had to wait a long time in ER and was separated from my supports... I knew I wasn't considered a medical emergency but for me it was an emotional emergency.*" After implementation: "*I appreciated how the Maternity Clinic got me in to see a doctor and organized an ultrasound for me right away.*"

- "I think what worked well was teamwork, and the involvement of people who have the lived experience – not only just the healthcare team – but the patient, the family, the caregivers are all part of the healthcare team. That is why the project worked well – we worked as a team, everyone listened to other people's point of view – and we collaborated in coming up with improvements for everyone."
- A patient who was able to receive treatment for alcohol use disorder under the AUD project stated: "*Halfway through my first glass, I lose interest.*" Today, she takes Naltrexone whenever she and her husband have company and she is going to drink. "*I don't feel safe without it,*" she said.
- A physician who changed the process for ER patient follow-ups said that patients were impressed with the new follow-up procedures and remarked that they never before had an emergency doctor call to check up on them.

### IMPACT ON PHYSICIAN EXPERIENCE

# Participating in PQI training and learning action projects have improved physicians' engagement in their work, reduced burn-out, and increased job satisfaction.

As previously reported, the PQI initiative is very successful in improving physician experience, particularly for those who get engaged in a more substantive way, complete PQI learning action projects, take on the role of advisors and mentors for others or get involved in leadership activities. Key informants provided various examples of how the PQI initiative has helped improve physician mental health and wellbeing. Physicians feel that they have more control over the system within which they operate, and the ability to influence decisions and create change. The participating physician job satisfaction has improved over the past few years (e.g., physicians reporting feeling meaningfully engaged in their organizations increased from 57% in PQI pre-training survey to 87% in post training survey in 2019/20). Physicians feel empowered to make positive change for their patients, their work environment, and themselves.

Our review of the projects as part of the case studies shows that all projects positively impacted physician experience regardless of whether they are explicitly designed to do so. In addition, all projects that improved patient health outcomes and patient experience inevitably improved the experience of physicians (as one physician noted: '*It is why we do this work*'). A few key informants noted that some physicians may have a negative experience with PQI because of the time and effort required, challenges with project implementation, limited support, etc. However, most representatives agreed that this was much less likely.

Of 15 projects reviewed as part of the case studies, 9 were reported to have improved physician experience. The most common feedback regarding improved physician experience has been categorized in the following way:

Improved Physician Experiences:	Examples:	
Involved in meaningful work	<ul> <li>Improving processes that lead to saving patient lives.</li> <li>Making a meaningful difference for the patients, their health outcomes and their experiences in dealing with health challenges.</li> </ul>	

#### Table 18: Improved Physician Experiences

Improved Physician Experiences:	Examples:
Reduced burn-out	<ul> <li>Reduced staff time on translation allowing them to focus on clinical work.</li> <li>Reduced burden of unnecessary work due to extra testing.</li> <li>Increased efficiency and reduced staff time for repeated testing and processes.</li> <li>Creating new systems that save physicians' time significantly, reduces stress and burn out.</li> </ul>
Improved patient experience impact physicians' experience	<ul> <li>Improving processes to increase patients' access to care, making care more effective and efficient.</li> <li>Physicians are better equipped to help their patients understand the health issues and treatments proposed, and better navigate the health system.</li> </ul>

### **REDUCED COSTS**

Some PQI learning action projects contribute to reductions in health costs. Many projects are perceived to have increased efficiencies and reduced costs, however, only a few have developed strategies to measure the cost-savings achieved.

Measuring cost savings or return on investment analysis is difficult and often requires sophisticated methodologies and specialized skills. Cost savings are often implied results of improved efficiencies in processes or protocols, reduced ER and hospital visits, reduced length of time patients spent in hospitals, increased productivity, reduced physician time spent on administrative tasks, reduced prescription rates of costlier medication, etc.

While 80% of those interviewed reported that their projects resulted in reduced costs, only one third conducted an analysis and measured the cost savings achieved. Direct annual savings were estimated to be around \$1.9 million. The following table provides a summary of the projects for which cost savings have been measured. The analysis does not account for savings that may have been achieved through the spread of these projects. For consistency purposes, only annual cost savings at the local organizations were included. However, the total amount would be much higher if the cost savings achieved from spread were to be included.

Projects	Cost savings measured
Reduce Unnecessary Transfers	\$59,800
Creating Quality MRI Images at University Hospital of Northern BC	
(UHNBC)	\$20,000
Early Detection of Preterm Delivery	\$37,000
Medical Follow-Up of Lab and Diagnostic Imaging Results in	
Emergency Department (ED)	\$144,313
Alcohol Use Disorder Treatment	\$1,660,000
Total	\$1,921,113

### Table 19: Summary of Projects That Measured Cost Savings

According to key informants and case study participants, outcomes from some successfully implemented and sustained projects can generate substantial cost savings for the BC healthcare system. For example, a project in an emergency department that helped to transition lab results from paper to an auditable electronic format, dramatically reducing physician time and paper use, was implemented and spread to about five additional hospitals. The team members who helped to

implement the project, estimated that \$711,409 annual savings were generated. In the spring of 2021, SSC working with the PQI teams estimated a total of \$13 million in cost savings from PQI learning action projects conducted to date. It is also important to remember that not all PQI learning action projects focus on cost reduction (nor should they) and that the initial focus for PQI was building skills and QI culture and developing collaborative relationships rather than achieving cost savings for the health care system.

The key challenge in understanding the impact of the PQI initiative in reducing health care costs is in the methodological complexity for measuring costs and savings achieved. The PQI team has developed some standard measures to assist physicians (e.g., costs associated with hospital stay daily costs, or hourly costs, etc.). Some key informants expressed a concern regarding a potential for the projects focusing on cost reduction to be prioritized over other projects during the selection process.

### **3.3 FACTORS CONTRIBUTING TO PQI IMPACT**

Key informants and case study participants highlighted many factors that have contributed to the success and effectiveness of the PQI initiative. The most common factors are identified below. For a more detailed list of lessons learned with respect to implementing PQI learning action projects see Appendix 1.

The factors contributing to success include:

- Physician driven quality improvement. The PQI approach to quality improvement involves the best practices from implementation science which suggests that the most effective and sustainable improvements are driven by those on the front lines. The core principle of PQI is to support front-line physicians to improve the systems they work in. In essence, it asserts that everyone has two jobs: first, to do the job they were trained to do, and second, to improve the system in which they do that job. Key informants noted that PQI has been effective in doing just that engaging physicians who see and recognize the inefficiencies and are best positioned to design and implement impactful QI changes. Physicians are also driven by a desire to make a positive impact and to improve patient care and systems of care. By providing training, supports, and partnerships, the PQI initiative has motivated physicians and enabled them to take leading roles in quality improvement. Quality improvement methodology, such as Plan, Do, Study, Act is an effective framework and tool that physicians can use to create projects, implement them, and demonstrate the impact of QI so that changes can be adopted, sustained, and spread to other similar settings.
- Access to resources and data. Physicians interviewed reported that access to resources, including access to human resources and supports, and being paid for their time, was an important incentive for their participation. Being reimbursed was critical for many physicians who noted that taking time off from the clinical side of their practice is incredibly challenging and getting paid for their time was an important recognition of the time and effort that is needed to complete the PQI training and projects. Being reimbursed for their time ensured that physicians allocated dedicated time, focus, and attention to the project. Most physicians interviewed also reported that having access to human resources (PQI team) to provide assistance with their projects and to help access and interpret data was critical for the success of their projects. Access to relevant

data was essential to many projects reviewed as part of the case studies. About half of those interviewed reported that without appropriate access to data their projects would not have been successful.

- Alignment with organizational and broader health authority priorities. Most key informants emphasized the need to ensure alignment of the PQI learning action projects with the priorities of the organizations where physicians work. It is consequential for the success of the projects, collaborative relationships, engagement, sustainability, and spread. One key informant noted that even the projects that are successful may never see 'the light of day' if the local management and the health authority is unable or unwilling to support it beyond the testing stage. If the implementation is too expensive and resources are not available to sustain or spread the project, it could result in damaged relationships, disengagement, disappointment, and limited or no positive return of PQI investment.
- **Establishing dyad partnerships**. Physicians as well as some PQI team members surveyed highlighted the importance of dyad partnerships, commonly established between a physician and health authority representative (e.g. local organization management or a health authority representative familiar with the subject matter). The dyad partner model helped physicians and their teams get more timely access to data, navigate the systems and bureaucracy, and sustain their QI improvements by receiving appropriate support (e.g. coordination, resources, connection to the leadership, etc.).
- **Collaborative spirit.** According to many key informants, the PQI initiative was the first successful attempt in the BC healthcare system to bring together health authorities and physicians to work in a truly collaborative environment. It has also helped bring together various key stakeholders (e.g., physicians, SSC, patients, administrators, etc.), and decision makers (MOH, health authorities) to work together to find solutions and work on continuous improvements of the health care system. The collaborative approach of the PQI initiative motivated participants, created synergies across the healthcare system, and created an open and collaborative environment.
- **PQI leadership and capable, dedicated staff**. Key informants and physicians talked highly of the PQI staff and their skills, capacity, dedication, and enthusiasm in supporting the initiative and the physicians involved. Staff members go above and beyond what is required of them to support physicians' projects or attend various committees and working groups to implement the activities of the initiative. The initiative has hired very qualified staff, coaches, and quality improvement experts who are dedicated to the success of the program and the physicians.
- Flexibility to adjust to regional circumstances. According to key informants, providing an adequate level of flexibility to health authorities to tailor the program to their specific needs and circumstances has been an important factor contributing to the success of PQI. BC covers a large geographic area, and the needs and circumstances of communities differ greatly across regions. For example, an approach that works well in the more populated regions may not be as effective in northern, isolated and/or rural communities. Key informants provided many examples of how the PQI approach used in the NHA is quite different compared to other regions, but it has worked well for the communities that it serves. Others noted the difference in health authorities that have high demand or unique and specialized health institutes (e.g. BC Cancer Clinics).
- **Developing and supporting PQI champions**. Most of the physicians involved in the steering committees and those participating in the case studies are passionate about PQI, and continue

to be engaged in QI activities, networks, advisory groups, and supporting/advising others to get involved. They are critical for marketing of PQI, engaging other physicians and building community and QI culture as well as spreading knowledge and quality improvement throughout the physician community.

### **3.4 FUTURE PRIORITIES AND OPPORTUNITIES**

The aspects of the PQI initiative, as it continues to evolve, that many identified should be a priority for health partners to consider are outlined below:

- Strategic focus on sustainability and spread. The approach to quality improvement sustainability, particularly spread, is currently somewhat inconsistently done on an ad hoc basis and through informal channels. For example, apart from final presentations, only 17% of physician alumni surveyed published their findings, and many physicians interviewed reported that they connected through the organizational structure or personal networks to spread their project results. Key informants believe that even the projects that were very effective in implementing quality improvement ideas and had significant impact on patient care remain relatively localized, with limited exposure to the broader medical community. Most key informants reported that issues related to sustainability and spread are currently discussed at the steering committee level and other decision-making tables. Some suggested that the PQI learning action projects that are well suited for broader spread and adoption (across hospitals, health authorities) should be flagged at the project design phase and, if successful, provided with additional supports to ensure that they are more systematically promoted, shared, and implemented where appropriate.
- **Carefully manage PQI growth and scaling**. The PQI initiative is gaining attention; demand and interest for the initiative is growing, even without significant efforts to market the program. While the current demand is likely to continue to be different across various health authorities, it will be important to ensure that resources are well balanced with demand and appropriately allocated across the health authorities. Given that appropriate human and financial supports are crucial for the success of PQI learning action projects, increasing pressure on staff to support more physicians/projects may result delayed project completions, increased drop out rates, and physician frustration. Similarly, increased proposal rejection rate or long wait lists may impact the reputation of the initiative.
- Demonstrating broader impact of the PQI initiative on the health care system. Developing an effective performance measurement system with clear, feasible, and measurable indicators will be necessary to demonstrate future impact of the PQI learning action projects. Key informants noted that the initiative is collecting a significant amount of data, including results of the projects, but it lacks a systemic way of demonstrating an overall impact of the initiative. There is a need to streamline the current performance measurement. It is challenging to create common indicators for an incredibly diverse and wide range of PQI learning action projects. However, an online reporting form could be designed for physicians to complete at the end of their projects and to report on the measurable project achievements. The form should be simple, focused on the Quadruple Aim impacts, and include specific data points that are measurable and comparable.

As illustrated under the impact section of this report, many projects will result in perceived impact in all areas of the Quadruple Aim; however, the primary objective(s) of the project should be clearly defined (e.g., improved patient experience) and the measurement of those achievements included (e.g., increased satisfaction in patient survey). Similarly, projects with a primary objective of reducing costs should include the methodology to estimate the cost savings. PQI staff could provide further support in extrapolating any cost savings over time or across the region.

- Finding the right balance between regional flexibility and centralization/harmonization of some functions across health authorities. While all key informants agreed that flexibility has been one of the key factors contributing to the success of the initiative, some argued that a certain level of harmonization is necessary. Key informants noted that as a bottom-up program, the success of the PQI initiative stems from its ability to adjust to regional and local circumstances. Conversely, key informants argued that some level of standardization, for example with respect to curriculum and PQI training, is necessary to ensure consistency in knowledge and skills. Other aspects of the program that will need careful deliberation is flexibility with respect to allocation of funding to respond to the demand across the health authorities and to respond to the priorities within each health authority.
- Ongoing engagement with physician alumni, particularly in identifying and supporting PQI champions. Many key informants recognized the need to continue to engage with the PQI alumni while ensuring that the expectations of physicians are appropriately managed past their graduation. In other words, the PQI initiative should set certain parameters regarding who, and under what circumstances, would be considered for ongoing support, particularly in the light of increased demand. The communication to physicians should be clear that completion of the PQI training or the PQI learning action project does not effectively qualify them for a leadership position or ongoing PQI support. Only physicians who are taking on projects that are larger in scope, are sustainable and supported by their health authorities, and can demonstrate significant impact may be eligible for additional support for data collection, sustainability strategy, etc. In addition, PQI champions who are passionate about QI, and are interested in continuing to be engaged in other projects or are requesting support to sustain the outcomes of their quality improvement initiatives, should be more effectively supported.
- Data digitalization and access. Access to reliable data was consistently reported as a critical factor contributing to the success of PQI learning action projects. However, many physicians faced challenges with identifying, obtaining, and analysing data relevant to their subject matter. Issues around getting approval to access the data, patient privacy, and the technical knowledge for data extraction and analysis have been commonly identified as slowing progress. The PQI physician alumni surveyed (2020) also indicated limited success in demonstrating their project improvement using data (60% ranked the issue of data as a weakness of the PQI initiative). The program has been working to address the issue through hiring data specialists and working closely with health authorities to increase access to data. Some key informants emphasized the importance of working with the Ministry of Health to speed the process of data digitalization, and improve consistency in how data is collected, recorded, and used across the province.

# 4. CONCLUSIONS AND RECOMMENDATIONS

### 4.1 MAJOR CONCLUSIONS

The following are major conclusions emerging from this evaluation.

#### INCREASING COLLABORATION AND BUILDING RELATIONSHIPS

The PQI governance structure and processes have created a collaborative environment, based on equal partnership, focusing on achieving mutual goals related to quality improvement in the health care system.

The PQI structure and processes have been effective in building collaborative relationships. The current PQI structure involves all major health partners, including patient partners, in consensusbased decision making. Physicians are encouraged and supported to lead quality improvement initiatives within the boundaries of health authority priorities.

Physician relationships and engagement with health authorities have improved significantly, as evident by their level of satisfaction in the post-training survey (the results indicate that physicians feel more valued, have more meaningful impact, and are more likely to be satisfied with the organizations where they work). In 2021, 93% of surveyed steering committee members reported that the PQI initiative positively impacted physician engagement with Health Authorities and 79% agreed that PQI has increased physician participation in health authority-led QI.

It takes time to build trust and relationships in a traditionally siloed health care system. The level of collaboration varies somewhat across health authorities and is generally linked to factors such as the level of demand and the ability to meet that demand, differences in opinion around governance and accountability (particularly as it relates to funding decisions), and balancing flexibility and the need to standardize certain aspects of PQI.

Alignment of PQI learning action projects with the priorities of the health authority and the local organizations where the projects are implemented is critical to QI sustainability and maintaining good relationships between physicians and health authorities. Key informants, including almost three quarters of steering committee members (72%), believe that the majority of projects are well-aligned with health authority priorities. Different strategies are used to ensure project alignment, including project selection criteria, involvement of the health authority sponsor, and dyad partnerships. A key challenge is that awareness and understanding of health authority priorities among physicians is not very high.

### STRENGTHENING OF QUALITY IMPROVEMENT CULTURE

The PQI initiative has contributed to building a QI culture within the physician community by improving their QI and leadership skills, focusing on patient-centric QI, and supporting QI sustainability and sharing of lessons learned.

Nearly 1,600 physicians (general practitioners, specialists, fellows) from across the province and a wide range of specialists participated in PQI training. Post-training surveys of participants show a significant increase (between 43% to over 50%) in those reporting improvements of their QI

knowledge and skills, competence, and confidence to lead QI activities, and involvement in leadership activities at their workplace. Key informants also reported a culture shift driven by PQI and its success in building and growing a PQI community through various networking opportunities, increased understanding and use of QI language, front-line driven QI changes, increased interest in QI related activities, and greater engagement with a broad range of health providers.

The PQI initiative has emphasized patient centric perspectives in quality improvement by getting patient partners involved in the steering committee tables and encouraging physicians to involve patients in their projects. Patients are often at the center of physician PQI learning action projects (the improvements are designed to improve patient health outcomes or experiences). About half of the surveyed physician alumni, and half of those interviewed as part of the case studies, reported involving patients in a significant way (seeking their input and feedback) in designing, implementing, or measuring the outcomes of their projects. While some projects may not warrant the involvement of patients, and it may be challenging and time consuming to engage patients to provide feedback, projects that are explicitly designed to measure patient experience should make efforts to do so.

Based on the case study findings, key informant interviews and alumni survey, feasible improvements achieved through learning action projects are likely to be at least partially sustained if local health team and management were effectively engaged. Sustainability of projects is closely linked to the support of senior management in the local organization, dyad partnerships, and the involvement of other health professionals in the project.

# Promoting and spreading the impact of successful PQI learning action projects more widely, across health institutions and the province, is important to cultivating a QI culture and increasing the return on investment.

About half of physician alumni reported that the findings from their learning action projects have been spread to other settings. Similarly, about half (7/15) of the projects reviewed had spread to other settings within the organization or health authority, including a few that have spread more widely across the province.

In many cases, there is no formal approach in place to spread the results. Most projects were spread through physician personal connections and ad hoc efforts, actions of the organization's management, and networking. Only 17% of physician alumni reported publishing the findings of their projects and, in our sample of 15 projects, only two had been published. The major challenges related to spread are lack of time, limited support and resource constraints, limited planning at earlier stages of project, and systemic barriers.

### IMPACT ON QUADRUPLE AIM

Teasing out the impact of projects regarding each of the IHI Quadruple Aim (patient health outcomes, patient experience, physician experience, and reduction of costs) is difficult, as improving outcomes in one area is almost certainly connected to improving outcomes in other areas. First, it is quite difficult to determine 'improved experience' as it is a subjective feeling unless measured systematically (pre and post intervention), which can be challenging, time consuming and resource intensive. Second, improving impact in one area (e.g., improving patient outcomes), is very likely to improve physician experience. Nevertheless, it is possible to categorize projects based on their primary objectives, secondary objectives, and their measured impact vs perceived impact. Using this categorization, the 15 projects that were reviewed had the following impacts:

- Improving physician experience. The PQI training has improved physicians' experience by giving them skills and tools to improve their work environment and improve care for their patients. Nearly all projects improved the physician experience by improving patient health outcomes and experience (almost every project that has improved patient experience was also perceived by physicians to have improved theirs), as well as by giving them opportunities to be involved in meaningful work and reducing burn-out.
- **Improving patient experience.** Most projects (over 80%) improved patient experience with care, either directly (i.e., were explicitly designed to improve patient experience) or indirectly (i.e. by improving their outcomes). Of these, five projects systemically measured patient experience via surveys, interviews or feedback collected more informally.
- **Improving patient health outcomes.** Over 70% of the projects reviewed (11/15) were perceived to have improved patient health outcomes. Of these, six had a primary objective of improving patient health outcomes and five improved health outcomes by improving other aspects of the health system (e.g., reduced patient stress or improved mental health by improving the patient's experience with the health system). A few projects saved lives through improved diagnostics and effectiveness of treatment (e.g., the febrile neutropenia project reduced the number of deaths from curative intend from four a year to zero since the new protocols were implemented).
- Reducing costs to the health care system. Of the 15 projects reviewed, five measured the cost savings achieved (the savings totaled \$1.9 million annually for the organizations where projects were implemented). SSC estimates that the PQI learning action projects have, to date, achieved cost savings (including cost avoidance) totaling about \$13 million. It can be very challenging to measure costs savings associated with some projects; however, projects with specific cost savings objectives should, with support of the PQI teams, develop the methodologies that will be used to measure the impact of the project with respect to reducing health care costs early in the process.

### **4.2 MAJOR RECOMMENDATIONS**

The major recommendations and proposed actions related to each priority area described in section 3.4 are presented below. Please note that some of the 'actions items' listed here are derived from the best practices identified by PQI health authority steering committee members and are already being implemented. Other recommendations provided by physicians, specific to learning action projects, are provided in Appendix 1.

In the collaborative spirit of the PQI initiative, the SSC and its health partners should work together to:

- 1. Develop strategic direction regarding sustainability and spread:
  - Clearly define the roles and responsibilities of various partners with regards to sustainability and spread of viable learning action projects.
  - Develop clear communication regarding the PQI initiative scope and limitations with respect to facilitating sustainability and spread of quality improvements.

 An assessment of the viability of sustainability and spread should be considered at the project initiation (e.g. is the project designed to for sustainability/can it be spread to other locations) as well as the completion stage (e.g. are the project results feasible to be sustained/spread). The 'viability' criteria will vary across projects, but consideration should be given to the applicability of the criteria to other locations/sites, costeffectiveness, impact on patient, and other factors.

### 2. Ongoing engagement with physician alumni and develop PQI champions:

 Manage expectations by developing guidelines and communication materials regarding the potential for future engagement and define the type of support and circumstances under which the PQI may provide ongoing support.

### 3. Manage the PQI initiative's growth and scaling:

- Consider sharing staff across health authorities and programs when and where needed, to meet increasing demand for support in some health authorities or for supporting specific aspects of learning action projects (e.g., specialized data access or analysis).
- Improve communication of health authority priorities, and the scope and limitations of the PQI initiative to physicians.
- Develop application intake strategies and processes to better manage the number of applications submitted, reviewed, and rejected.
- Balance the number of projects undertaken by new applicants vs. those who have completed learning action projects in the past.

### 4. Create guidelines with respect to patient involvement in learning action projects:

• Physicians working on improving patient experience should be strongly encouraged to engage with patients and measure the change achieved.

# 5. Develop a performance measurement system to demonstrate the broader impact of the PQI initiative on the health care system:

- Develop clear, feasible, and measurable indicators to demonstrate future impact of the PQI learning action projects and manage expectations (e.g., measure what matters and what you can control). Streamline the data collection tools as new tools are developed (e.g. ensure there is no duplication in post-survey questions, alumni questions, and any future forms that may be developed).
- Develop learning action project impact assessment forms to be filled out at the closing of the project (the forms developed as part of this evaluation could be adjusted). The form should be available online and should be simple, focused on the quadruple aim impacts, and include specific data points that could be rolled up (forms developed as part of this evaluation could be adjusted for this purpose).

### 6. Balance regional flexibility with a need for standardization of certain aspects of PQI:

- Identify issues/areas of the PQI initiative that require standardization (e.g., consistency in QI curriculum, type of supports available to physicians for learning action process, etc.)
- Develop guidelines, tools, and materials (e.g., intake process to manage increase in demand, selection processes), but allow for sufficient flexibility in implementation across health authorities by PQI health authority steering committees. Allow for some flexibility

with respect to funding allocation to ensure different health authorities can respond to their unique demand and priorities).

### 7. Data digitalization and improved data access:

• Engage with MOH and health authority representatives to communicate the importance of prioritizing data digitalization, standardization, and access for overall quality improvement in health care.

## **APPENDICES**

### A.1 LESSONS LEARNED AND RECOMMENDATIONS

### LESSONS LEARNED

THEMES/CATEGORIES	SUMMARY OF COMMENTS
Importance of QI	<ul> <li>The success of the PQI initiative is linked to the QI knowledge, skills and capacities of physicians.</li> </ul>
knowledge and skills	<ul> <li>Many physicians wish to make changes in their workplace but lack the necessary skills and knowledge to do so.</li> </ul>
gained	<ul> <li>The PQI training was essential for building skills and knowledge required to implement a project successfully. The</li> </ul>
	training helps to build capacity and knowledge in areas such as data presentation, presentation skills, and infographics,
	which are key tools used in quality improvement work and which make completing the projects much easier.
	<ul> <li>QI methodologies taught in the PQI training are simple and straightforward to implement. It provides an effective</li> </ul>
	"framework" to design future projects.
	<ul> <li>The knowledge can be transferred easily to a team or to other stakeholders. By participating in the PQI training and</li> </ul>
	completing a project, physicians were able to generate interest among their colleagues about quality improvement.
	PQI training and learning action projects increase awareness of importance of ongoing quality improvement for patient
	care. Physicians gained new perspectives through engagement with patients and other stakeholders.
Importance of effective	<ul> <li>Flexibility to adjust to changing circumstances was critical for the successful implementation of some projects. For</li> </ul>
project design	example, flexible deadlines were helpful during the pandemic.
	<ul> <li>Ensuring that scope of the learning action project is reasonable. Planning for the project including identification of</li> </ul>
	timelines, resources, and tools required, plays an important role in project success. Physicians noted that projects with
	smaller scope may not have substantial impact, while projects with broader scope may not achieve goals and the
	physician can easily burn out.
	<ul> <li>Time and resources management. Physicians noted that organizing the project into smaller steps can be beneficial for</li> </ul>
	time management. Time remains a challenge to completing PQI learning action projects.
	<ul> <li>Designing projects, to the extent possible, around the issues familiar or of interest to physicians – implementing ideas</li> </ul>
	based on experience are the best way to bring about quality improvement.
	<ul> <li>Identify specialized supports early in the planning phase. Some physician projects required specialized data or expertise</li> </ul>
	which may be beyond the capacity of the PQI teams. Physicians noted that planning for the additional resources if
	necessary and getting buy-in from the departments or individuals is important for managing time and progress on the
The second second f	project.
Importance of	<ul> <li>Collaboration and teamwork to ensure successful implementation. Physicians noted that quality improvement work is a multi-discipling mean and that called pretion between abusicians and athen stated about (noticets, discipling).</li> </ul>
Collaborative Approach,	multi-disciplinary approach, and that collaboration between physicians and other stakeholders (patients, clinicians,
	administrators, communities, other specialist areas, other departments, etc.) to understand issues, barners and create
Slakerioider	solutions is required.
Engagement	<ul> <li>reall approach was key to addressing complex issues. It is also useful to take a team approach to new idea generation</li> <li>and brainsterming colutions when problems arise.</li> </ul>
	and prainstorming solutions when problems arise.
	<ul> <li>Pooling resources with other stakeholders can benefit a project by giving it a wider range of options.</li> <li>Change initial and parameters with stable address in project by giving it a wider range of options.</li> </ul>
	<ul> <li>Strong initial engagement with stakeholders is necessary to ensure all parties are on board with changes.</li> </ul>

THEMES/CATEGORIES	SUMMARY OF COMMENTS
Data Availability and Access Patient Involvement	<ul> <li>Time and efforts required for data collection should be taken into consideration in the project planning phase.</li> <li>Data systems must be flexible, user friendly, and provide clinically meaningful data to enable physicians to complete their projects and demonstrate the impact of their solutions.</li> <li>Collecting and reporting accurate data and access to this data is critical for understanding the problem and measuring impact of project outputs.</li> <li>Including the voice of patients and families in projects and as part of the QI team is important to improving patient care outcomes. Understanding first hand experiences of patients and families helps identify areas for improvement and</li> </ul>
	<ul> <li>Implement interventions that are effective and helpful.</li> <li>Engaging with and educating communities and/or family members is important in helping patients make the right choices for their health.</li> </ul>
Support from Health Authority and Local Organization Management/Dyad Partnerships	<ul> <li>Buy-in from health authority leadership and administrators is essential, particularly having a knowledgeable sponsor from the health authority who is willing to support the project and act as a collaborative resource was a key to success.</li> <li>Awareness of changing priorities and setting realistic expectations at the health authority level. This can affect budget priorities and resources available, for example, staff and resources being pulled away to other projects thus delaying a project or impacting sustainability.</li> <li>The dyad partnership with the health authority was helpful. Physicians who participated in a dyad partnership through the health authority for their project viewed it as positive, especially when navigating the health authority structures and systems.</li> <li>Support and buy-in from senior management are key. Gaining support and buy-in from local management and clinical leadership can help to remove bureaucratic and structural barriers to sustaining changes and scaling. Physicians noted that it is more likely that the QI culture and the changes implemented by a project will be taken up at an organizational level if management and leadership are involved.</li> <li>Projects are more successful when they involve other staff members from the lead physicians' workplace. Involving other staff can improve buy-in at the local level, help to build a robust quality improvement team, and provide new perspectives on the issue.</li> </ul>
Support from PQI	<ul> <li>Support from the PQI Team was essential. Many physicians noted that their project would not have been implemented successfully without the help and regular check-ins with the PQI team, especially for data analysis and logistics support).</li> <li>Occasionally, PQI teams' lack of direct subject matter experience was a barrier. Physicians noted that, their lack of medical education and understanding meant physicians had to occasionally spend extra time discussing concepts or editing background information, communication materials, because team members were unfamiliar with medical terms and concepts.</li> </ul>
Sustainability and Spread	<ul> <li>Quality of the project outputs matters. If a project creates a new protocol or system, the quality and feasibility of the changes are important for implementation/sustainability. For example, ensuring that the process is reliable, accurate, user friendly, and can be adapted to changing environments.</li> <li>Ongoing staff and physician education is needed to ensure sustainability. In many cases, adoption of changes requires ongoing training and education of health partners and staff that will implement new processes.</li> </ul>

THEMES/CATEGORIES	SUMMARY OF COMMENTS
	<ul> <li>Support and funding to demonstrate the impact of projects. Having good data to demonstrate project impact is the most effective way to get buy-in from others and to spread learnings to other health departments/HA/regions, etc.</li> <li>Systemic changes take time. Physicians noted that changing the health care system is challenging; it can take significant time and energy, and therefore continuously engaging with local organizations and teams on issues related to QI is important.</li> </ul>

### RECOMMENDATIONS

ASPECT OF PQI	SUMMARY OF RECOMMENDATIONS
Engaging Local	• More integration and a team-based approach is essential. The PQI initiative currently prioritizes the training and support of
Teams	physicians, however most projects are implemented in collaboration with staff from other disciplines (e.g., nurses). Physicians
	noted that providing training and support for a team-based approach to implementing projects would be useful for building QI
	culture and sustainability.
Ensuring	• Sustainability should be built into the project plan from the beginning. Designing the project with sustainability in mind can help
Sustainability	physicians be more prepared to sustain their project, and to get buy-in from stakeholders who would be involved in sustaining
	the project in the future.
•	• Provide PQI learning action projects with operational funding for sustainability. Although physicians are paid for participating in
	the training and for completing the project, there is no funding support for operational expenses associated with sustaining the
	project after graduation. Physicians suggested that sustaining the outcomes of projects would be easier if funding was available
	to continue projects.
•	to champion quality improvement initiatives within their departments or organizations. This may include creating administrative
	co champion quality improvement initiatives within their departments of organizations. This may include creating administrative
	loarning action projects, or to link each POI loarning action project to organizational loadership who will support the sustainability
	of the project
	<b>Improve infrastructure to support sustainability</b> . Resource allocation and support systems within organizations/departments
	would help to sustain quality improvement practices. Physicians may begin to feel burnt out trying to sustain changes on their
	own, and they may disengage from guality improvement entirely due to this. Having infrastructure and resources (including
	human resources) specifically tasked with ensuring sustainability of successful projects would ensure more consistent adoption
	of changes.
•	Recognizing quality improvement successes more broadly. Physicians suggested that it matters where recognition is coming
	from. For example, physicians often champion their own projects in their respective practicing areas but may not be as successful
	at getting attention of physicians in different specialties. Physicians suggested that better communication and marketing
	strategies should be developed to inform others of the successful project results.
•	Create new opportunities for physicians to apply their quality improvement skills after graduating. Physicians are excited about
	quality improvement and want to continue making a positive impact, but once they complete their learning action projects, they
	struggle to find other opportunities to use what they learned. Physicians suggested that the PQI and health authority should
	create a more structured process to identify potential opportunities for further engagement.
Ensuring Spread	• Create a detailed database for PQI learning action projects. Physicians expressed interest in learning more about previous and
	ongoing quality improvement projects but noted that the current system does not provide enough detail for them to understand
	what the project's goals, implementation process, and outcomes were. Physicians also noted that they would like to know what
_	other projects have been adopted more broadly, particularly in their area of speciality.
	quality improvement, and that the success of a project's outcomes are not the only factors that affect whether a project will be
	quality improvement, and that the success of a project solution are not the only factors that affect when a project will be spread. There are local and organizational factors (e.g., priorities, coordination, resources atc.) that make it challenging for
	nhysicians to facilitate the spread of their project on their own. Providing additional supports to physicians that are flexible and
	prysicials to realize the spectral of their project of their owner rounding additional supports to physicialis that are there and
	take into account the needs of the spread site would be beneficial in ensuring that quality improvement changes can benefit the

ASPECT OF PQI	SUMMARY OF RECOMMENDATIONS
	<ul> <li>Support spread at the provincial level through Ministry and health authority collaboration. Physicians noted that in some cases, projects could be spread provincially and be able to improve patient care, improve experiences of care, and reduce costs at a much larger scale, but that there is no mechanism or leadership to support the provincial spread of PQI learning action projects. It was suggested that the PQI initiative work towards gaining more active support from the Ministry of Health and health authority leadership to champion provincial spread and to facilitate the spread of these projects more easily.</li> </ul>
Better Communication	<ul> <li>Improve communication regarding QI roles, responsibilities, and health authority priorities. Physicians noted some health authorities were not clear about their QI priorities, who is responsible for quality improvement initiatives, and what quality improvement work is ongoing. They noted that quality improvement leaders within health authorities should be more accessible and identifiable to physicians to collaborate and engage with about QI. Physicians suggested that the health authority should communicate what their needs/priorities are with respect to quality improvement and work together with PQI alumni to continue QI work.</li> <li>Health authorities should identify a list of key priorities and projects for quality improvement. Physicians suggested that health authorities should also provide support for developing a project plan, identifying personnel that can assist in implementation, measurement, and sustainability of the project outcomes.</li> </ul>
Additional Training and Support	<ul> <li>More training on overcoming resistance to quality improvement and change management. Some physicians noted that creating and implementing change management is challenging and additional training on how to initiate change and overcome resistance or roadblocks would be useful. They also suggested additional training to develop their mentoring skills so that they can teach staff and other clinicians how to adapt and adopt quality improvement changes and systems.</li> <li>Returning to in-person workshops to build connections. Physicians noted that, in some cases, moving to an online learning model has been beneficial (e.g., in health authorities covering large geographical areas). One of the strengths of the PQI training is being able to collaborate and network with physicians from different specialties. Physicians noted that they would like to resume in-person training when possible or have the option of a hybrid model with virtual and in-person learning options.</li> <li>Create QI training for leadership and administrative staff. Physicians suggested that training for leadership and administrative staff on quality improvement methodology would help to spread quality improvement culture and would improve communication related to QI including common goals, importance of QI, limitations, and challenges.</li> <li>Ensure that QI advisors, coaches, and mentors have the skills and expertise to effectively support physicians. Physicians noted that there should be more oversight from the PQI coordinators to ensure that the PQI Physican Coach/Advisor is a good fit for a project. They also noted that additional or ongoing training should be given to PQI staff to ensure effective project support.</li> <li>Continue PQI support beyond one year. Physicians suggested that continuing the PQI program for alumni (e.g., PQI 'phase 2') to allow physicians to complete more advanced training and undertake another project for those who wish to continue to be involved would be helpful. Physicians also noted t</li></ul>

ASPECT OF PQI	SUMMARY OF RECOMMENDATIONS			
	challenging areas (e.g., extra time to complete given long hours of travel that are often necessary, increased use of virtual			
	communication, etc.).			
	<ul> <li>Provide support for measuring project outcomes. Physicians noted that in some cases, their projects required specialist support</li> </ul>			
	(e.g., health economist) in order to measure the impacts of the project's implementation and to calculate return on investment.			
Building	<ul> <li>Formalize connections with the health authority. Some physicians noted that there is a disconnect between the health authority</li> </ul>			
Relationships	leadership and the front-line clinicians who may have quality improvement ideas. Physicians suggested that all projects should			
	have a connection to their health authority to ensure collaboration with senior administrators and to further strengthen the			
	relationship between physicians and their health authority.			
	<ul> <li>Formally introducing physicians to their mentors. Given the importance of the physician mentor to the physician who is</li> </ul>			
	completing a project, it is important to establish formal relationships between both parties through PQI. In some cases,			
	physicians never met their mentor, and their projects were affected by a lack of guidance and resources. Ensuring meaningful			
	engagement between the physicians and the mentors would increase the likelihood of success.			
	• <b>Providing formal systems for alumni interaction.</b> Physicians noted that once they graduate from the PQI cohort training, there is			
	limited follow-up and engagement with PQI. Physicians suggest that alumni have access to a formal network of PQI alumni in			
	order to collaborate and share experiences, as well as to learn more about projects that other physicians completed.			
Managing	• Expectations should be set regarding what is possible to achieve within the time frame. Some physicians struggled to manage			
Expectations	timelines for their project, collect data, get feedback from patients and clinicians while continuing to work full time in their			
	practice or hospital. Physicians also suggested that the project plans should require that physicians describe the data analysis			
	plan, stakeholder engagement, team building, etc. Physicians stressed that having a robust and comprehensive project plan at			
	the beginning is critical for success.			
Data access and	<ul> <li>Data support and access. Physicians noted that more guidance is needed on how to access data and/or collect the appropriate</li> </ul>			
collection	data and ensure that data support is ongoing throughout the project (not just at the data collection phase). It is critical for			
	physicians to understand data they will require so that they can make the data request as early as possible.			
	Create ways for physicians to quickly access patient data. Data collection was noted by physicians to be one of the most important			
	aspects of their projects, but they often struggled to quickly get patient data that was up to date, relevant, and useful because the			
	electronic systems that track and store patient data are not nexible of easy to use and may not have the most recent data available. Additionally, projects were delayed because of the length of time required to receive the data. Ensuring that physicians			
	available. Additionally, projects were delayed because of the length of time required to receive the data. Ensuring that physicians			
	improvements more often			
	<ul> <li>Prioritize digitalization. Physicians reported struggling to get the most up to date and accurate data on patient health because</li> </ul>			
	health care records are still largely paper-based, and if stored, it is difficult to identify and access it. Physicians noted that being			
	able to analyze trends and changes related to their patients because data is not available. Physicians need to be able to access			
	high quality data on a regular basis, not just while doing a quality improvement process, and digitalizing paper-based records and			
	updating the electronic medical recording systems would benefit the health care system, administrators, physicians, and			
	clinicians greatly.			
Engaging Patients	More training on patient involvement is needed. Physicians who participated in interviews were sometimes unsure how to involve			
	patients in their projects. In some cases, patient involvement is not necessary, but in other cases, not having measured and			
	tracked patient feedback can have negative consequences for the success of the project. Providing more training on different			
	methods that can be used to involve patients, when to use each method, and collaboration strategies could be helpful to increase			
	patient involvement.			

ASPECT OF PQI	SUMMARY OF RECOMMENDATIONS					
	<ul> <li>Patients should be involved in the early stages of the project. Physicians noted that for projects that aim to measure direct impact on patients, particularly with respect to their experience, early engagement is important to establish a baseline.</li> <li>Patient advisors should be matched to projects more accurately. Physicians noted that, in some cases, their patient advisor was not a good match for their project and did not understand their project. Physicians suggested that patient advisors should be</li> </ul>					
	better matched to the project to ensure good working relationships and better results.					
	Project plans should include strategies for patient/stakeholder engagement. Physicians noted that they spent considerable time					
	during their project on engagement strategies/developing surveys, etc. They suggested that realistic expectations should be set					
	early in the process regarding what is possible and required inputs from stakeholders and patients. Building surveys prior to the					
	start of the project can ensure that there is enough time to collect and analyze the data.					
Other	<ul> <li>Ensure the PQI program is flexible and keeping up with the needs of physicians, other clinicians, and patients. Physicians</li> </ul>					
	suggested that the PQI initiative continue to learn and grow to keep up with the needs of patients, physicians, clinicians, and					
	administrators while remaining flexible in its implementation and structure to be able to change as the need arises. In other					
	words, continuous quality improvement of the PQI initiative to ensure it stays relevant, rewarding, and useful.					
	• Improve the PQI learning action project tracking tool (The Exchange). Physicians noted that the PQI learning action project					
	progress tracking tool was not user friendly or accessible for information sharing purposes. The tool should be improved.					

### A.2 CASE STUDIES IMPACT SUMMARY

CASE STUDY #1: IN PROFICIENCY	/IPRO	OVE COMMUNICATION IN RICHMOND E	MERGENCY FOR PATI	ENTS WITH LIMITED E		
Case Study Interviewed a physician lead in charge of the project development and implementation						
Methodology		Reviewed documents and files associat	ted with the project i	ncludina.		
hicelouology	-	Kwok MMK Chan RK Hansen C e	t al Access to Transla	ator (AT&T) project: Int	erpreter on	
		Wheels during the COVID-19 page	demic. BMI Open Ous	ality 2021.10.e001062		
		doi:10.1136/bmiog-2020-001062	actific. Divij operi Que	ancy 2021, 10.0001002.		
		<ul> <li>Doctors of BC. Dr Matthew Kwok</li> </ul>	- helping health care	providers and patients	s use the same	
		language in the ER, MAY 29, 2020.	gea.e			
Background		Emergency department in Richmond H	lospital serves a popu	ulation that is over 60%	immigrant, of	
5		which 50% identify as Chinese. In 2016	census, only about 3	3% residents of Richmo	ond reported	
		their mother tongue as English. The ho	ospital frequently enc	ounters patients who l	have limited	
		English proficiency (LEP) with interpret	ation needs. The hos	pital lacks dedicated in	terpreters and	
		regularly used staff members who had	proficiency in a seco	nd language for interp	pretation or relied	
		on family members to communicate w	ith patients.			
Objectives	•	Objective Statement: The objective of t	he project was to imp	prove communication b	between hospital	
		staff and patients who have limited Eng	glish proficiency by h	aving a dedicated inter	rpretation service	
		at the hospital emergency department	•		1	
		Objectives	Primary	Secondary		
		Improve Patient Health Outcomes	,	~		
		Improve Patient Experience	<ul> <li>✓</li> </ul>			
			✓			
		Reduce Costs				
	•	Project design: A survey of 17 native Cr	ninese speaking patie	ents demonstrated that	t 76% of the	
		patients understood less than hall of the	ne medical content di	iscussed and 94% of th	em would choose	
Patient		Project implementation: The project in	volved a total 477 virt	tual interpretation sess	sions using	
Participation		'Interpreter on Wheels' services totali	ng 4123 interpretation	n minutes (2835 audio	minutes and	
		1288 video minutes) of usage.				
		Project outcome measure (e.g., satisfa	ction): Satisfaction wa	as measured via survey	y	
ACHIEVEMENT O	FQ	UADRUPLE AIM				
	Pe	erceived:				
Improved Dationt	≻	Improved effectiveness of care: Better communication leading to more reliable diagnosis &				
Health Outcomes		effective and care.				
	≻	Improved access: During pandemic remote communication enhanced - improved access to over				
		200 languages (including sign languag	e) 24/7.			
, <u>, , , , , , , , , , , , , , , , , , </u>	≻	Measured: Patients reported very high	degree of satisfactio	on with the services. 16	9 clients who	
Improved Patient		rated their level of satisfaction with the	e services using on-de	evice ratings systems p	provided an	
Experience	7	average rating of 4.4 on a five-point rating scale.				
Improved	~	Perceived: n/a Measured: Eliminating the use of health and shaft and health an				
Physician		months of project implementation	incare starr as du HOC	micer preceis by 50% W		
Finisician		Perceived: Improved communication with nations				
	>	Measured: No specific cost-saving ana	lysis was conducted			
	×	<b>Perceived:</b> the costs of the platform we	ere estimated to be o	ff-set by the reduced s	taff time (the cost	
Reduced Costs		was \$4,612 for two months vs. each red	gistered nurse who si	poke Mandarin and/or	Cantonese lost	
an average 35 minute per each shift for translation).						
SPREAD AND SUST	AIN	ABILITY				
Sustainability	•	Sustainability: The demand for virtual i	nterpretation service	s at the department gr	rew rapidly.	
and Spread	•	Spread: The results of the of the project	ts have been spread	to other hospitals with	in the health	
		authority. Once the project was comple	eted, a team summar	ized the results and pu	ublished an article	
		in BMJ Open Quality journal as well as	on the Doctors of BC	website.		

CASE STUDY #2: DI	ECREASING INAPPROPRIATE AND AVOIDA	BLE TRANSFERS FROM	LONG-TERM CARE TO	EMERGENCY		
DEPARTMENT	<ul> <li>Interviewed a physician load in char</li> </ul>	a of the project dovel	loomont and implomen	tation		
Mothodology	<ul> <li>Interviewed a physician lead in char</li> <li>Interviewed the purse educator investigation</li> </ul>	ye of the project devel	iopinent and implement	Itation.		
wiethodology	<ul> <li>Interviewed the nurse educator invol</li> <li>Boviowed decuments and files associated</li> </ul>	nived in the project.	including			
	Reviewed documents and mes assoc	2020	, including.			
	Presentation to VCH Medica	2020 Coordinators Winter	Breakfast Meeting in L	2020		
Background	<ul> <li>Banfield Pavilion (VCH) is a residential</li> </ul>	al care site home to 15	5 complex and mostly f	Frail alders There		
Backyrounu	are 6-10 transfers from Banfield to V	an couver General Hos	nital Emergency each n	nonth but		
	research in Canada has shown that 2	research in Canada has shown that 25% of transfers are likely preventable. Reducing the number of				
	transfers can reduce unnecessary co	sts complications and	d crowding in hospitals	It can also lessen		
	the emotional and mental burden on	frail elders with deme	entia. It can be better fo	or the patient to		
	get care at their residence.					
Obiectives	<ul> <li>Objective Statement: Avoid inapprop</li> </ul>	riate and avoidable tra	ansfers of frail elders fr	om lona term		
	care to emergency and prevent unne	cessary admission to	acute care.	5		
	Objectives	Primary	Secondary			
	Improve Patient Health Outcomes		√			
	Improve Patient Experience	√				
	Improve Physician Experience	✓				
	Reduce Costs		✓			
	Project design: n/a					
Patient	<ul> <li>Project implementation: Implemented</li> </ul>	d several education p	rocesses for both staff	and families,		
Participation	discussed goals of care with families (e.g., "What matters to your loved one?").					
	<ul> <li>Project outcome measure (e.g., satistication)</li> </ul>	Project outcome measure (e.g., satisfaction): n/a				
ACHIEVEMENT OF	QUADRUPLE AIM					
	Measured: Not measured.	Measured: Not measured.				
Improved Patient	Perceived - Improved appropriatene	<b>Perceived - Improved appropriateness of care:</b> enhanced assessment of those who were				
Health Outcomes	transferred to ER. Increased underst	anding of goals of care	e for patient and famili	es to determine		
	Dest treatment sites.					
The second Detters	<ul> <li>Measured: Inappropriate and avoidable transfers to ER reduced, and patients that are transferred have a specific transfer plan.</li> </ul>					
Improved Patient	nave a specific transfer plan. <b>Perceived:</b> On site medical interventions and earlier treatments can improve nations everyones by					
Experience	Perceived: On site medical intervention reducing panel to go to ED.	<ul> <li>Perceived: On site medical interventions and earlier treatments can improve patient experience by medicing paged to go to ED</li> </ul>				
Improved	Massured: This project did not moss	reducing need to go to EK.				
Physician	Perceived: Improved staff/physician	weasured: This project did not measure an improvement in physician experience.				
Fynerience	Ferceived. Improved stan/physician	communication.				
Experience	Measured: Saved \$59 800 in ER costs					
Reduced Costs	<ul> <li>Perceived: Reduced ER visits reduces</li> </ul>	financial burden on h	ospitals/health care sv	stem.		
SPREAD AND SUST	AINABILITY					
Sustainability	Sustainability: Many interventions re	main in place after pro	piect end, and COVID-19	9 increased		
and Spread	awareness of reducing unnecessary	emergency transfers.	,, <del></del>			
	<ul> <li>Spread: Being rolled out to other site</li> </ul>	s (4 nursing homes). (	Contact made with cont	racted nursing		
	homes but on hold due to COVID-19.	Presentations have be	een made to other nurs	sing homes and		
	regional board.			-		

CASE STUDY #3: REDUCE UNNECESSARY GROUP AND SCREEN						
Case Study	<ul> <li>Interviewed a physician lead in cha</li> </ul>	rge of the project devel	opment and implemen	tation.		
Methodology	<ul> <li>Reviewed documents and files asso</li> </ul>	ciated with the project,	including:			
	Cohort 4 Final presentation: Pr	eoperative Group and S	Screens – A patient cent	tered model		
	March 12, 2021 presentation to	the health authority (r	e: "home" hospital)			
Background	Pre-operative Group and Screen (GS	Sc) confirms a patient's	blood type prior to sur	gery and requires		
	an extra trip to the hospital and an	extra blood draw. It is ir	nconvenient for the pat	ient. Two		
	separate samples are needed to cor	nfirm the blood group, r	esulting in unnecessar	y bloodwork and		
	use of resources. At Vancouver Acut	e, of approx. 14,500 anr	nual elective surgery pa	atients, 65%		
	require a GSc.					
Objectives	<ul> <li>Objective Statement: Identify elective</li> </ul>	e surgical patients who	do not require a pre-o	perative GSc and		
	reduce unnecessary routine GSc by	50% within 6 months fo	r pre-operative bloodw	ork in patients		
	with low transfusion risk in orthope	dic joint reconstruction.				
	Objectives	Primary	Secondary			
	Improve Patient Health Outcomes					
	Improve Patient Experience		✓			
	Improve Physician Experience	,	✓			
	Reduce Costs	$\checkmark$				
	<ul> <li>Project design: No patient surveys v</li> </ul>	vere conducted for the p	pilot, and no patient ad	visors were		
Patient	included in the project.					
Participation	<ul> <li>Project Implementation: Patients we</li> </ul>	ere not involved in proje	ect implementation.			
	<ul> <li>Project outcome measure (e.g., satis</li> </ul>	sfaction): Reduced unne	ecessary GSc, but patier	nts did not		
	provide feedback.					
ACHIEVEMENT OF QUADRUPLE AIM						
Improved Patient	Measured: n/a	Measured: n/a				
Health Outcomes	Perceived: n/a					
	<b>Measured:</b> 2,000 fewer trips to hospital annually, reduced time, with the percentage of elective					
Improved Patient	surgical patients (joint surgery) getting a GSc decreasing from 65% to just below 50%.					
Experience	> Perceived: Patient experience will b	e improved by making t	ne process less wasten	ul of their time		
Improved	Moogurodu p./p					
Physician	<ul> <li>Measureu. n/a</li> <li>Borcoived: Boducad burdan of unna</li> </ul>	cossarywork				
Experience	Perceived. Reduced burden of drifte	Cessaly work.				
Experience	Measured: Approximately \$30,000 iii	a cost savings and savin	as in human resources			
Reduced Costs	Perceived: 2 000 fewer trips led to re	duced costs Potential	cost savings for natient	s. ts from reduced		
neudeed costs	travel/time spent		cost savings for patient	is nonneudeed		
Suctainability	- Sustainability creating a dashboard	to pull data automatic	ally for CSc rates Stand	lard operating		
and Spread	<ul> <li>Sustainability. Creating a dashboard</li> <li>procedures have been developed</li> </ul>	to pull uata automatica	ally for GSC rates. Stand	aru operating		
and spiedu	<ul> <li>Spread: Opgoing work to scale up to</li> </ul>	more surgical services	and model the work in	a way that is		
	relevant to the province. Next steps	hring to other surgical	leaders encade with a	ther areas (a d		
	urology, spinal/neurology, generals	surgery), work with othe	er hospitals to allow GS	c at patient		
	"home" hospitals to reduce travel					
	nome nospitals to reduce travel.					

CASE STUDY #4: CF	REATING QUALITY IMAGES AT UHNBC				
Case Study	Interviewed a physician lead in charge of the project development and implementation.				
Methodology	<ul> <li>Interviewed the PQI physician coach</li> </ul>	Interviewed the PQI physician coach who helped to support this project.			
	<ul> <li>Reviewed documents and files assoc</li> </ul>	iated with the project, i	ncluding:		
	<ul> <li>Storyboard for project, project</li> </ul>	ect charter, cost analysi	s, PowerPoint present	tation of results	
	(Nov, 2020).				
Background	<ul> <li>Magnetic Resonance Imaging (MRI) i</li> </ul>	s a medical imaging teo	hnique used to create	e detailed images	
	of organs and tissues inside the body	. The procedure may ca	ause anxiety for patie	nts. Any	
	movement during the scan will result	in lower quality imagir	nes, which means radi	ologists have a	
	difficult time reading the MRI accurat	ely. Low quality images	lead to repeat MRIs.	Ensuring	
	complete, high quality MRIs is critical	complete, high quality MRIs is critical to ensure the best patient care and to reduce unnecessary			
	costs of re-imaging.	· · · · · · ·			
Objectives	<ul> <li>Objective Statement: Improve the MI</li> </ul>	R quality and patient ex	kperience from 86% to	94% by April	
	2020 in an effort to reduce the numb	er of repeat MRI scans	needed. Improve the	quality of the MRI	
	Images from 84% to 95% by April 202	U. Drins or r	Casandan	1	
	Objectives	Primary	Secondary		
	Improve Patient Health Outcomes			-	
		•		-	
	Improve Physician Experience		•	-	
	Reduce Costs	nod with nationt owner	v ionco in minde 17 chor		
	<ul> <li>Project design. The project was design identified in a brainstorming session</li> </ul>	to improve patient exper	erience and improve	ige lueas were	
	scaps				
	<ul> <li>Project implementation: In the waiting</li> </ul>	a room: natients aiven	information on wait t	imes and delays	
	information on their scans, and detailed instructions on their scans: informational posters were				
Patient	also put up. Waiting area was transfo	rmed into a "patient ca	llming area", with con	nfortable chairs.	
Participation	During the scan: patients were regularly checked in on every 3-8 minutes and given a countdown of				
	remaining time left in the scan. Patie	nts were given music to	listen to during the s	can. Additionally,	
	the parking system was improved to	reduce worry about tic	kets, and patients wer	e sent	
	information about their scans via em	ail.			
	<b>Project outcome measure</b> (e.g., satisfaction): Satisfaction, measured using a survey. MRI quality.				
ACHIEVEMENT OF QUADRUPLE AIM					
Improved Patient	Measured: Improved patient health of	outcomes were not mea	asured for this project	•	
Health Outcomes	Perceived: Patients get best and time	ly treatment when rad	ologists can accurate	ly read their MRI	
	scans.		. (h. 1 1		
Improved Patient	Measured: Pre-survey: 86.1% of patie	ents said they would rat	e their experience po	sitive or very	
Experience	positive. Post survey: 90.9% rated positive or very positive.				
Improved	Measured: n/a				
Physician	Perceived: Increased efficiencies red	uce physician time spe	nt reneating processe	s and MRI testing	
Experience	improved staff morale.	ace physician ante spe	in repeating processe	s and what testing,	
	Measured: The percentage of high-g	uality scans increased f	rom 83.4% at baseline	e to 94.7% at	
Reduced Costs	project end. Estimated savings of \$2	50 per MRI, \$20,000 per	year after project imp	plementation.	
	> Perceived: Reducing repeat MRIs also	o reduces patient spend	ling on travel, and ad	ministrative costs.	
SPREAD AND SUST	AINABILITY	· · · ·	-		
Sustainability	Sustainability: Quality of scans remai	ns improved over basel	ine in August 2020. Da	ata can be	
and Spread	examined again over time, if image q	uality drops.	-		
	• Spread: Not many MRIs in the region	(only 2), and image qu	ality not an issue in ot	her facilities, so	
	spread was not a goal.				

CASE STUDY #5: Q	UAL	ITY ENDOSCOPY PROGRAM					
Case Study	•	Interviewed a physician lead in charge	Interviewed a physician lead in charge of the project development and implementation.				
Methodology	•	Interviewed two team members who also worked on the project.					
	•	Reviewed documents and files associated with the project, including:					
		Project description, storyboar	d, PowerPoint slides	, consultation and refe	rral process		
		charts.					
Background	•	Two physicians perform diagnostic col	onoscopies and gasti	roscopies and are look	ing to improve		
	services and patient care within their facility. Demand for endoscopy services is growing,						
	demand outweighs capacity. The referral process requires significant manual work and strains						
		administrative capacity.					
Objectives	•	Objective Statement: Improve the clinic	cal outcomes and qu	ality of patient and pro	vider experience		
		of endoscopy services. Aims to improve	e efficiency, access, p	oatient satisfaction, pro	vider skills, and		
		data analysis.					
		Objectives	Primary	Secondary			
		Improve Patient Health Outcomes	1	v			
		Improve Patient Experience	<b>√</b>				
		Improve Physician Experience	v				
		Reduce Costs			h. * *		
		Project design: Patient feedback was u	sed to inform proces	s development throug	n interviews.		
	-	<b>Project implementation:</b> Project looked at patient experience of care and considered many angles					
		(do they have somewhere to put their language support, etc.) and provided s	upport to those who	struggle to access car	e (transportation		
Patient		virtual consultations) Focused on patie	appoint to those who ant elements of the r	eferral process proced	lures and follow-		
Participation		up Met henchmarks for wait times					
		<b>Project outcome measure</b> (e.g., satisfaction): Satisfaction and benchmarks. Completed a series of					
natient satisfaction and feedback surveys. Improved natients follow-up rate by 50%. In					%. Interviews also		
		showed that 100% of patients were sat	isfied.	1 5			
ACHIEVEMENT OF QUADRUPLE AIM							
Improved Patient > Measured: This project did not measure patient health outcomes.							
Improved Patient	$\succ$	Perceived: By increasing access to care	, patients can more	readily get the care the	ey need to be		
		healthy.					
Improved Patient	$\triangleright$	Measured: Improved patient comfort,	privacy, dignity. Mea	sured through satisfac	tion surveys.		
Fynerience		Improved accessibility.					
	$\succ$	Perceived: Reduced patient stress by p	roviding transportat	ion and virtual consult	ations.		
Improved		Measured: Decrease physician stress b	y improving prograr	n efficiency. 6 of 12 ide	ntified action		
Physician		plans have been implemented.					
Experience		Perceived: Collaboration and teamwor	k with other specialis	sts improved relationsh	hips. Regularly		
•		scheduled committee meetings to mai	ntain relationships.				
Reduced Costs		Measured: I his project did not measur	e cost savings.				
	<u> </u>	reiceiveu: increased productivity in th	e system, tracking qu	daily indicators saves (	UTI COSIS.		
SPREAD AND SUST				H			
Sustainability	<b>Sustainability</b> • Sustainability: Post-procedure survey still ongoing, continually tracking quality indicators.				licators.		
and Spread	•	Spread: Not spread yet, but neighbori	ng community will ta	ke up some of what th	e project nas		
	1	done. Knowledge and learning have be	en snared with eigh	t other communities.			

CASE STUDY #6: ER OPIOID SUBSTITUTION THERAPY							
Case Study	<ul> <li>Interviewed a physician lead in charg</li> </ul>	e of the project devel	opment and implemer	ntation.			
Methodology	<ul> <li>Reviewed documents and files associ</li> </ul>	Reviewed documents and files associated with the project including:					
	2019 forum poster board, Isl	and Health PQI backg	rounder				
Background	Canada has one of the highest incider	nt rates of opioid addi	ction per capita. ERs ha	ave historically			
	focused on treating the complications	of opioid abuse, but	patients do not always	follow through			
	with addiction referrals. Without subs	titution therapy, patie	ents cannot reliably wa	it for traditional			
	ER referral to treatment because patie	ER referral to treatment because patients need to use their drugs several times a day to avoid					
	withdrawal sickness. A shift is needed	in the ER culture to h	elp these patients.				
Objectives	<ul> <li>Objective Statement: Change the eme</li> </ul>	rgency room culture	to view opioid addictio	n as a chronic			
	illness that can be treated by offering	100% of opioid addict	ed patients the opport	tunity to start			
	substitution therapy with Suboxone a	nd immediate referra	for addictions treatm	ent.			
	Objectives	Primary	Secondary				
	Improve Patient Health Outcomes	✓		_			
	Improve Patient Experience	✓					
	Improve Physician Experience		✓				
	Reduce Costs						
	<ul> <li>Project design: Patients were not invo</li> </ul>	lved in project design					
Patient	<ul> <li>Project implementation: To the extent</li> </ul>	that they participate	d in the treatment.				
Participation	<ul> <li>Project outcome measure (e.g., satisfa</li> </ul>	action): Increased refe	erral rates to opioid su	bstitution			
therapy.							
ACHIEVEMENT O	F QUADRUPLE AIM						
	Measured:						
	<ul> <li>Improve appropriateness: By the example</li> </ul>	end of the project the	re had been over 153 r	eferrals from ERs,			
Improved Patient	indicating more appropriate care f	or addiction itself, ver	rsus treating effects of	addiction.			
Health Outcomes	<ul> <li>Improve access: Project improved</li> </ul>	access to trauma info	ormed care in the ER by	/ increasing			
	cultural awareness of substitution	therapy.					
	Perceived: If physicians are more awa	re of the treatment o	ptions for opioid addic	ted patients, they			
	can prescribe the treatment to those	can prescribe the treatment to those patients, leading to better health outcomes overall.					
Improved Patient	Measured: Not measured for this pro	ect.					
Experience	Perceived: Patients do not have to suf	fer the effects of with	drawal while in the ER				
Improved	Measured: More than 50% of physicia	ns surveyed responde	ed that they feel comfo	ortable treating ER			
Physician	patients in withdrawal with Suboxone	(a change from less t	than 20% at baseline).				
Experience	Perceived: Having access to a tool that	t makes physicians' jo	bs easier while saving	lives improves			
·	physicians' experiences of providing of	care.					
	Measured: Not measured for this proj	jeci. 		www.wathaiw.haalth			
Reduced Costs	Perceived: From a patient perspective overall reducing cost for complex car	e, those who are stabil	ized may be able to im	financial costs to			
	the nations and their loved ones	e needs in the future,					
SPREAD AIND SUST		ten dende oden evit	n de udies d ED evil	a mata sala			
	Sustainability: Formalized suboxone s	tandard order set, sta	indardized ER suboxon	ie protocols.			
and Spread	<ul> <li>Spread: Information has been shared</li> <li>modia Protocols posted on the Example</li> </ul>	broadly throughout E	sc in numerous forums	s, and on social			
	Spread to all ERs in VIHA since 2017						
CASE STUDY #7: W	ОМ	EN-CENTERED APPROACH TO EARLY PRE	GNANCY LOSS				
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Case Study	•	Interviewed a physician lead in charge	Interviewed a physician lead in charge of the project development and implementation.				
Methodology	•	Contacted a patient involved in the pr	oject but did not hea	r back.			
	•	Reviewed documents associated with	the project, including	g:			
		Learning action project subm	ission, 2018 evaluation	on algorithm, 2019 earl	y pregnancy loss		
		handout, ER order sheet, 2019	9 early pregnancy los	ss brochure, PowerPoin	nt slides: woman-		
		centered care in early pregna	ncy loss, project pos	ter.			
Background	•	25% of women will experience a misca	rriage in their lifetim	e, which can cause dep	ression as well as		
		anxiety in future pregnancies. Most wo	omen go to the ER fo	r miscarriages, which is	a difficult place		
		to be grieving, and to have privacy and	to be grieving, and to have privacy and receive emotional support. There is a misconception that				
		only an ER can provide access to urger	it ultrasounds, but w	omen deserve to get th	nat care in a		
		positive and supportive environment.					
Objectives	•	Objective Statement: 90% of women re	ceiving "standard of	<sup>:</sup> care" by July 2018. A w	oman-centered		
		approach to early pregnancy loss (EPL)	) and bleeding for pa	tients will lead to bette	r continuity of		
		care and patient satisfaction.					
		Objectives	Primary	Secondary			
		Improve Patient Health Outcomes	$\checkmark$				
		Improve Patient Experience	$\checkmark$				
		Improve Physician Experience		$\checkmark$			
		Reduce Costs					
	•	Project design: Incorporated feedback	from patient collabo	orators for standard of o	care, best		
		practices, patient experience, and patie	ent care. Included a p	patient voices represen	tative, a clinic		
Patient		nurse, dietician, office assistant, and pl	nysician.				
Participation	•	Project Implementation: Patients helpe	ed to develop questic	ons and provided feedb	back on the		
		questionnaire. Patients were interview	ed about their exper	ience (n=10-15).			
	•	Project outcome measure (e.g., satisfa	ction): Satisfaction w	ith care increased.			
ACHIEVEMENT O	FQ	UADRUPLE AIM					
Improved Patient	≻	Measured: 92% of women received "st	andard of care" duri	ng the quality improve	ment project.		
Health Outcomes	≻	Perceived: Increasing the rate at which patients receive "standard of care" improves health					
Treatth Outcomes		outcomes overall, and in this case, improves patients' mental well-being.					
	≻	Measured: Qualitative data showed the	at people were more	satisfied with care afte	er project		
		implementation.					
Improved Patient	≻	Perceived: Providing a warm environm	ent. Educating physi	icians on how to provid	e care to patients		
Experience		experiencing early pregnancy loss more gently, improves patient experience of care at a difficult					
		moment in their life. Providing urgent	access to appointme	ents, diagnostics, ultras	ounds, and		
		unlimited access to follow up visits red	uces patient anxiety.	•			
Improved	≻	Measured: Improved physician experie	ence was not measur	red for this project.			
Physician	≻	Perceived: Education was provided to t	the team to increase	familiarity with how to	talk about		
Experience		pregnancy loss with patients, makes p	hysicians' jobs easier	r when they know how	to approach		
		sensitive issues.					
Reduced Costs	≻	Measured: n/a					
	$\succ$	Perceived: n/a					
SPREAD AND SUST	AIN	ABILITY					
Sustainability	•	Sustainability: Work has been sustaine	d in the clinic.				
and Spread	•	Spread: There has been no spread bey	ond the clinic, but fir	ndings have been share	ed at various		
		forums and meetings.					

CASE STUDY #8: Ph	HLG	FBP-1 (ACTIM PARTUS) TEST AND THE FF	N TEST FOR SPONTA	NEOUS PRETERM BIRT	H IN	
SYMPTOMATIC WC	OME	N ON VANCOUVER ISLAND				
Case Study	•	Interviewed a physician lead in charge	of the project develo	pment and implement	ation.	
Methodology	•	Reviewed documents and files associated with the project including:				
		Published Journal article: Chen,	Michael X. et. al. (202	0). Comparison of Feta	al Fibronectin and	
		Phosphorylated Insulin-Like Gro	owth Factor Binding F	Protein-1 Testing to Pre	edict Preterm	
		Delivery in Symptomatic Womer	n: A 10-Year Retrospe	ective Study. Journal of	Obstetrics and	
		Gynaecology Canada, Volume 4	2, Issue 8, 971 – 976.			
		Project description summary				
Background	•	Preterm delivery (PTD) is a birth that h	appens before 37 we	eks of gestation and o	ccurs in	
		approximately 8% of pregnancies. It is	a leading cause of ne	eonatal mortality and n	norbidity. 1 in 5	
		women presenting with suspected pre-	term labour end up c	lelivering preterm. Ear	ly detection of	
		PTD is critical to ensure effective treatr	nent, targeted referra	als, and decrease unne	ecessary	
		interventions.				
Objectives	•	Objective Statement: Assess the diagno	ostic accuracy of the	Actim Partus test (com	pared with fFN	
		test) which determines potential PTD, o	optimize the diagnos	tic workup to improve	quality of care	
		and cost effectiveness, and make recor	mmendations to the l	BC Lab Agency Utilizati	on Management	
		Committee to update the 2005 provinc	ial guidelines.		1	
		Objectives	Primary	Secondary		
		Improve Patient Health Outcomes	$\checkmark$			
		Improve Patient Experience		✓		
		Improve Physician Experience		✓		
		Reduce Costs	$\checkmark$			
Patient	•	Project design: Patients were not direc	tly involved in the pro	oject design.		
Participation	•	Project implementation: n/a				
•	•	Project outcome measure (e.g. satisfac	tion): n/a			
ACHIEVEMENT O	FQ	UADRUPLE AIM				
	۶	Measured:				
		<ul> <li>Improve accessibility and timelines</li> </ul>	s: Promoted a point o	of care test that can be	done at the	
Improved Patient		patient's bedside in a timely manne	er.			
Health Outcomes		<ul> <li>Effectiveness of diagnostics: Right t</li> </ul>	type of test is used by	/ clinicians.		
	≻	<b>Perceived:</b> Providing point of care test	s, particularly in the r	ural setting, improves	patient health	
		outcomes by ensuring more timely tre	atment.			
Improved Patient	>	Measured: Improved patient experience	ce was not measured	for this project.		
Experience	~	perceived: Patients can get results with	in minutes; decrease	es stress for patients a	nd family	
Improved	~	Menuers.		ad for this project		
Dhysisian		<b>Derseived:</b> Improved physician experie	nd interpret the recu	ed for this project.	ch raducas strass	
Experience		and increases their ability to manage r	nu interpret the resu	its within minutes, whi	chileduces siless	
Experience	~	Monocured: Estimated appual cost savin	allerit Care.	14 and \$104 400 provin	cially	
Peduced Costs		Berceived: Using Actim Partus tosts ins	tood of a combinatio	n of Actim Partus and	othor tosts	
Reduced Costs		reduces costs. The Actim Partus test is	accurate and cost eff	fective	other tests	
SPREAD AND SUST	ATN	ABILITY				
Sustainability		Sustainability: Sustained within the HA	Moved testing to tie	$\alpha$ - hased approach. If $\Delta$	ctim Partus test is	
and Spread		positive then additional testing is done				
		Spread: The results were published. Th	 le proiect was spread	widely across the prov	ince by changing	
1	1	Spread: The results were published. The project was spread widely across the province by changing				

CASE STUDY #9: FE	BRI	LE NEUTROPENIA					
Case Study Methodology	•	Interviewed a physician lead in charge of the project development and implementation. Reviewed documents and files associated with the project, including:					
		PQI newsletter, 2020 and the SSC exchange database.					
Background	•	Diagnosis and treatment of patients with Febrile Neutropenia at the ER was slower than international standards by about 2 hours, and occasionally resulted in incorrect antibiotics being prescribed. Febrile Neutropenia occurs when a patient has a fever and significant reduction in					
		white blood cells needed to fight infections. Chemotherapy patients experience suppressed immune response due to chemo treatment. The consequences of slow diagnosis and ineffective treatment results in some patients dving or being critically ill					
Objectives	•	<b>Objective Statement</b> : Reduce the number of deaths resulting from curative intent (patient dying from treatment) due to slow and inaccurate treatment given to chemotherapy patients with Febrile Neutropenia. Project aims to understand drivers of misdiagnosis and treatment, create a better					
		process for triaging patients to get the	m quick treatment, a	and improve time to tre	eatment to meet		
		Objectives	Drimon	Secondary			
		Improve Patient Health Outcomes	Primary	Secondary			
		Improve Patient Health Outcomes	v				
		Improve Patient Experience		↓ ↓			
		Reduce Costs		•			
		Project design: Patients were not involve	ved in the project de	sian			
		Project Implementation: Patients were	given an information	n card which outlines t	he protocol for		
Patient		Febrile Neutropenia treatment but they were not involved in its development.					
Participation		<ul> <li>Project outcome measure (e.g., satisfaction): Patients reported being able to take more control of</li> </ul>					
		ensuring they get the proper care.	, ,	5			
ACHIEVEMENT O	FQ	UADRUPLE AIM					
	>	Measured:					
		Improved timeliness of care: Redu	uced time to treatme	ent from 6 hours to 2 ho	ours, in line with		
		international standard. Patient red card ensures patients are involved in ensuring they get					
Improved Patient		proper treatment.					
Health Outcomes		<ul> <li>Improved effectiveness of diagno</li> </ul>	sis and treatment: Ir	ncreased rates of corre	ct treatment from		
		less than 50% to 100%. Still at 100% since implementation in 2014. Reduced number of patient					
		deaths from 4 per year to 0. No deaths since implementation.					
		<b>Perceived:</b> Patient health outcomes are improved when they do not die from curative intent, and					
	~	when they are given the correct antibio	otic the first time.				
Improved Dationt	~	Measured: n/a	allows them to have	more central over the	vir own troatmont		
Experience		<b>Perceived:</b> Giving patients the red card allows them to have more control over their own treatment					
experience		and gives them more agency because they are aware of what correct treatment protocols look like					
Improved	~	Measured: Pre-printed order is now us	ed at nearly 100% of	FR visits			
Physician	>	Perceived: Reduced risk of patient dea	th/misdiagnosis redu	ices physician stress			
Experience	Ĺ	referred. Reduced fish of putient ded	in mould gridelis read				
	$\succ$	Measured: Cost reduction was not mea	asured in this project				
Reduced Costs	>	<b>Perceived:</b> n/a					
SPREAD AND SUST	AIN	ABILITY					
Sustainability	•	Sustainability: Protocols are sustained	at the original ER.				
and Spread	•	Spread: Protocols have been spread su	iccessfully throughou	ut the health authority	to all 13 hospital		
	1	ERs as of 2015.		,	•		

CASE STUDY #10: [	DELI	RIUM: DECREASING THE DISTRESS AND	<b>"EAGLE RIDGE HOSP</b>	PITAL (ERH) DELIRIUM (	COLLECTIVE"			
Case Study	•	Interviewed a physician lead in charge of the project(s) development and implementation.						
Methodology	•	Interviewed a patient partner.						
	•	Reviewed documents and files associa	Reviewed documents and files associated with the project, including:					
		Storyboards for both projects	, an editorial co-writ	ten by the lead physicia	n, presentation			
		slides for the project						
Background	•	Delirium is a serious clinical issue, affe	cting 30% of geriatric	: medical inpatients. De	lirium causes			
		stress and confusion for patients, care	givers, and providers	. It increases challenge	s in treating co-			
		morbidities, leads to extended hospita	l stays which can in t	urn increase hospital a	cquired infection			
		and cost of care.						
Objectives	•	Objective Statement: The aim of the "D	Decreasing the Distre	ss" project was to decr	ease the distress			
		experienced by geriatric patients and f	amilies with delirium	n in ERH medical units b	y 30% by June			
		2018. The aim of the "ERH Delirium Col	llective" was to chan	ge the standard of care	for 5% of all			
		medical patients in ERH by June 2018.						
		Objectives	Primary	Secondary				
		Improve Patient Health Outcomes		✓				
		Improve Patient Experience	$\checkmark$					
		Improve Physician Experience	$\checkmark$					
		Reduce Costs		✓				
	•	Project design: Two patient partners w	ere involved in the p	roject and attended tea	am meetings,			
		reviewed data and measures, discusse	d challenges, review	ed literature and survey	ys.			
Patient	•	Project implementation: English speak	ing caregivers were	surveyed on their servio	ce experience,			
Participation		feelings and worries, opinions of educa	ation and informatio	n provided, and awarer	ness and use of			
		community services.						
	•	Project outcome measure (e.g., satisfa	ction): Caregiver fee	dback.				
ACHIEVEMENT O	FQ							
Improved Patient	≻	Measured: Improved patient health ou	itcomes were not me	easured for this project				
Health Outcomes	≻	Perceived: By improving the standard	of care, it is assumed	l that patients will have	better health			
Treatth Outcomes		outcomes across the board.						
	≻	Measured: Standard of care was changed for hundreds of patients illustrated by increased use of						
		the Delirium Pre-Printed Order (PPO) fr	om 3.9% to 7.6% of a	ll patients. There was a	decrease in			
Improved Patient		length of stay by more than 1 week, dr	opping below expec	ted length of stay.				
Experience	≻	<b>Perceived:</b> Improving the standard of o	care and decreasing	the length of stay for d	elirium patients			
		reduced their distress and confusion. (	Caregivers reported f	feeling that patient's ill	ness had been			
		explained to them.						
Improved	$\succ$	Measured: n/a						
Physician		Perceived: Improved physician skills ar	nd understanding, m	aking treatment of pat	ients easier.			
Experience								
		Measured: Cost savings were not measured	sured for this project	- 				
Reduced Costs	≻	Perceived: Reduced length of stay in h	ospital reduces costs	for both patients and l	health care			
	system.							
SPREAD AND SUST	AIN	ABILITY						
Sustainability	•	Sustainability: The delirium PPO was in	cluded as part of the	e admission package, fa	cilitating			
and Spread		sustainability at the local site.						
	•	Spread: A dashboard with metrics has	been created but ha	s not yet been released	across the			
	1	health authority.						

CASE STUDY #11: E	ECHO	OCARDIOGRAMS AS A PURPOSEFUL ORD	ER				
Case Study Methodology	•	<ul> <li>Interviewed a physician lead in charge of the project development and implementation.</li> <li>Reviewed documents and files associated with the project, including:</li> <li>Project posters, editorial co-written by lead physician.</li> </ul>					
Background	•	Echocardiogram is a test used to provide information on the cardiac condition of a patient, and is available to both outpatients and inpatients. 43% of echocardiograms performed at Burnaby Hospital are ordered for inpatients. In 2017, approximately 51% of inpatients remain admitted in the hospital while they waited for their echocardiogram, which extends their inpatient length of stay by an average of 5 days over expected length of stay. This decreases the flow of patient discharge, reduces bed capacity, stresses resources, and increases costs for the hospital.					
Objectives	•	Objective Statement: Improve the proc	esses for echocardio	gram ordering to redu	uce the number of		
		inpatient echocardiograms that were b	eing ordered.		_		
		Objectives	Primary	Secondary			
		Improve Patient Health Outcomes		✓			
		Improve Patient Experience	$\checkmark$				
		Improve Physician Experience		✓			
		Reduce Costs	$\checkmark$				
Patient Participation	•	Project design: Patients were not involv Project implementation: Patients were Project outcome measure (e.g., satisfac	ved in the design of t not involved in the ir ction): Not measured	his project. nplementation of this l.	project.		
ACHIEVEMENT O	F Q	UADRUPLE AIM					
Improved Patient Health Outcomes	<b>A</b>	<b>Measured:</b> The Echo rebooking rate decreased from 48% to 33%, meaning outpatient tests could occur more quickly. <b>Perceived:</b> Improved client care by ensuring that patients can receive echocardiograms as an outpatient in a timely manner.					
	$\triangleright$	Measured: Number of inpatient Echos	ordered per week de	ecreased by 32%, outpa	atient wait list		
Improved Patient		decreased, length of stay on the inpatie	ent unit when Echos	were ordered decreas	ed by 2 days		
Experience		overall.					
	≻	Perceived: Patients can wait for echoca	rdiograms at home i	now, rather than at the	e hospital.		
	≻	Measured: Standardized booking proce	ess, reduced inconsis	stencies in triaging for	Echos by creating		
Improved		a purpose-driven ordering and booking	g process.				
Physician	≻	Perceived: At baseline, there was a beli	ef held by physicians	s that outpatient echo	cardiogram		
Experience		booking wait times could be 6 weeks to	3 months. Physiciar	ns' confidence with the	e process		
		increased when Echos were still being l	booked quickly, thus	reducing stress arour	nd the process.		
Reduced Costs	≻	Measured: Cost savings were not meas	sured for this project	•			
	>	Perceived: Improved utilization of hospital resources reduced costs.					
SPREAD AND SUST	'AIN	ABILITY					
Sustainability	•	Sustainability: Sustained at Burnaby Ho	ospital.				
and Spread	•	Spread: New requisition form has been spread regionally across 10 hospitals, and provincially.					

CASE STUDY #12: N	ЛED	ICAL FOLLOW-UP OF LAB DIAGNOSTIC I	MAGING RESULTS I	N EMERGENCY DEPART	MENTS		
Case Study	•	<ul> <li>Interviewed a physician lead in charge of the project development and implementation.</li> </ul>					
Methodology	•	Interviewed an IMIT specialist involved with the project's technical implementation.					
	•	Reviewed documents and files associa	Reviewed documents and files associated with the project, including:				
		Project presentation video: https://www.commune.com/project/presentation/project/project/project/project/project/project/project/project/project/project/project/project/project/project/project/project/project/project	ttps://www.youtube.	com/watch?v=4h9O-			
			0kO2M-S1XIAcl9Pr7x	Vb&index=6			
		Project description, project point	oster.				
Background		Microbiology and diagnostic imaging r	esults often fall thro	ugh predictable gaps (	physicians not		
5		working every day, staff turnover, pape	er being lost/misplad	ced). ED and inpatient l	ocations are		
		moving to electronic patient tracking.	while lab results are	still reported on paper	. Paper and time		
		are wasted during this process, not to	mention the serious	implications for patien	ts whose results		
		go missing. Microbiology and diagnost	ic results need to be	e moved to an electroni	c system to		
		improve efficiency, accuracy, keep up v	with the times, and re	educe risks to patients	and physicians.		
Objectives		Objective Statement: Move lab broadca	ast and printed resul	lts to an electronic plat	form, develop a		
		new streamlined process for identificat	tion and communica	tion of abnormal resul	ts to physicians,		
		discontinue printing lab results and de	velop an IT solution	for an automated "call	back" feature,		
		spread the process to other sites within	n the health authorit	IV.			
		Objectives	Primary	Secondary			
		Improve Patient Health Outcomes					
		Improve Patient Experience		√			
		Improve Physician Experience	✓				
		Reduce Costs	✓		-		
		Project design: Patients were not invol	ved with the design	of this project.			
Patient		<b>Project implementation</b> : Patients were	not involved with th	e implementation of th	nis project.		
Participation		<b>Project outcome measure</b> (e.g., satisfa	ction): Development	and use of electronic l	ab result follow-		
		up system.					
ACHIEVEMENT O	FΟ						
		Measured: Improved patient health or	itcomes were not me	easured for this project	t.		
Improved Patient		<b>Perceived:</b> Improved timelines: It is no	w much simpler and	l easier for ED physicial	ns to track		
Health Outcomes		necessary follow-ups to inform patient	s of their results and	help with prescription	ns, leading to		
		improved care.			.o, .caag to		
		Measured: Improved patient experience	ce was not measured	d for this project.			
Improved Patient	>	<b>Perceived:</b> Patients' feedback about ph	nvsician follow-ups w	vas positive, system sav	es them time in		
Experience		needing to call the hospital to follow-u	p on results themse	lves.			
	≻	Measured: Significant physician time v	vas saved (8 mins pe	r patient vs. 15 mins pe	er patient before		
Improved		implementation). The new system run	s with 91% effectiver	ness, reliability, and cor	npletion, reducing		
Physician		wasted physician time on follow-ups o	f approximately 14 h	iours per week.			
Experience	≻	Perceived: Project resulted in reduced	administrative strain	n on physicians as well	as less wasted		
•		physician hours and decreased clinicia	n frustration. Physic	ians provided positive	feedback.		
	≻	Measured: Estimated cost savings afte	r spread throughout	t health authority: \$711	,409, nearly 3.5		
		million over 5 vears. Return on Investn	nent (ROI) ratio estir	nated at 3.73x.			
Reduced Costs	≻	Perceived: By reducing paper waste ar	nd eliminating unneg	essary administrative l	ourden on		
		physicians and medical staff, the proje	ct avoids unnecessa	ry costs to the hospital			
SPREAD AND SUST	AIN	ABILITY					
Sustainability		Sustainability: project has been sustain	ed in the originating	n FD.			
and Spread		Spread: Spread to four or five other ho	spitals so far Howey	yer due to hospitals' u	se of different		
		electronic medical recording systems	more resources are	needed to adapt project	t for spread to		
		other systems.					

CASE STUDY #13: A	ALCO	HOL USE DISORDER TREATMENT					
Case Study	•	Interviewed a team member involved	in the project develop	pment and implement	ation.		
Methodology	•	Reviewed documents and files associated with the project, including:					
		Presentation slides from February 2021; Poster: The new standard of care for alcohol use					
		disorder. British Columbia Patient Safety and Quality Award: https://bcpsqc.ca/quality-					
		awards/winners/jeff-harries/					
		SSC article from January 2021: htt	ps://sscbc.ca/news/2	021/01/28/helping-cha	ange-paradigm-		
		treatment-alcohol-use-disorder-b					
		BC Centre on Substance Use profile https://www.bcccu.co/blog/2021/	le from March 2021: $\frac{102}{15}$	profile of a trailblazor	-1		
		Article from Dec 2021: http://this	bangodmypractico c	profile-of-a-traiblazer	/ lor/		
		<ul> <li>Canadian Alcohol use Disorder So</li> </ul>	ciety website: https://	/www.cauds.org	1017		
Background	•	About 1 in 5 Canadians aged 15 and old	der are affected by Al	cohol Use Disorder (Al	JD) in their		
<b>g</b>		lifetime. About 350,000 British Columbi	ans are affected by A	UD. 40% of emergency	y department		
	,	visits are caused or impacted by alcoho	ol consumption and A	UD creates demands i	n other parts of		
	1	the health care system. The overall cos	t of AUD is estimated	at \$5.4 billion a year in	n Canada. AUD		
	(	can be treated through medications fo	r AUD, which compler	ment counselling and	other supports.		
Objectives	- (	Objective Statement: Increase physicia	n and nurse practitio	ner awareness of med	ical treatment		
		options for AUD, increase the proportio	on of AUD patients tre	eated appropriately an	id according to		
		best evidence.	<b>D</b> :		1		
		Objectives	Primary	Secondary			
		Improve Patient Realth Outcomes	v	./			
		Improve Patient Experience		• •			
	-	Peduce Costs	✓	•			
		Project design: Patients were not involve	ved in the design of th	nis project			
Patient		Project implementation: Patients were	not involved in the in	no project.	project.		
Participation		Patient perceptions of outcome measu	red (e.g., satisfaction	): Patient stories, video	os, and quotes		
	i	indicate the positive impact of these m	edications on patient	s and their families.			
ACHIEVEMENT O	F QU	IADRUPLE AIM					
	>	Measured: Improved appropriateness	and accessibility of ca	are by quadrupling nu	mber of		
		prescriptions for AUD medication. Befo	pre project, the mean	number of Naltrexone	e dispensed at		
Improved Patient		community pharmacies per 10,000 pop	oulation was 1.24. This	s increased to 2.96, 4.5	8, and 5.95 after		
Health Outcomes		each Continuing Medical Education eve	ent (CME) where lead	physician presented t	he findings.		
	$\triangleright$	Perceived: Patient stories, videos, and	quotes show the posi	tive impact of these m	edications on		
		patients and their families.					
		Measured: Improved patient experience	ce was not systematic	ally measured but sto	ries/feedback		
Improved Patient		Perceived: De stigmatization of how Al	tion with treatment.	ians nationts familios	ota con improvo		
experience	-	nation experience of care. Patient feet	dback and stories on i	using the medication y			
Improved		Measured: Improved physician experie	ence was not measure	ad for this project	were positive.		
Physician		<b>Perceived:</b> Medications also provide ho	ppe for the health car	e provider – as they ar	e better able to		
Experience	, in the second s	provide support to the patient using ev	vidence-based approa	aches.			
	$\triangleright$	Measured: Cost avoidance calculated t	o be \$1.66 million per	year.			
Reduced Costs	$\triangleright$	Perceived: By increasing the use of AU	D medications as trea	itment, costs associate	ed with		
		complications of AUD are avoided.					
SPREAD AND SUST	AINA	BILITY					
Sustainability	• :	Sustainability: CME events continued o	ver the past four year	rs, lead physician has g	given more than		
and Spread		150 presentations, reaching 4,000 indiv	viduals across BC.				
	•	<b>Spread:</b> IHA Mental Health Substance l	Jse and Emergency D	epartment Network h	ave taken up the		
	i	integration of the AUD treatments. Lea	d physician sat on the	e AUD Guidance Devel	opment		
	'	Committee for the BC Centre on Substa	ance Abuse (released	Dec 2019), and establ	ished the NGO		
		Canadian AUD Society. Lead physician	tacilitated an awarene	ess campaign by leadi	ng accessible,		
	i	interactive, small-scale CME events, lea	iding to greater under	rstanding of AUD treat	tments.		

CASE STUDY #14: P	PEN]	ICILLIN DE-LABELLING FOR HIV PREP PA	TIENTS					
Case Study	•	Interviewed a physician lead in charge of the project development and implementation.						
Methodology	•	Reviewed documents and files associa	ted with the project,	including:				
		Project description	Project description					
		Article on SSC website: https:/	//sscbc.ca/news/202	0/10/30/doctors-unite-	fight-incorrect-			
		diagnoses-penicillin-allergy						
Background	•	10% of patients in BC's medical system	believe they're aller	gic to penicillin, but 90 <sup>,</sup>	% of those			
		patients are mistaken. Having the aller	gy label leads to pre	scribing second line an	tibiotics, which			
		may not be the best option for patients	s, and is a more expe	nsive treatment. For pa	atients who are			
		on immune suppressants like those tak	king HIV Pre-Exposur	e Prophylaxis (HIV PrE	P), being able to			
		get penicillin if an infection occurs is es	sential for their care					
Objectives	•	Objective Statement: This project aime	d to create a process	s to test and de-label pa	atients with a			
		penicillin allergy if they do not have a t	rue allergy, and to he	elp physicians who arei	n't allergists			
		assess and de-label penicillin allergies.						
		Objectives	Primary	Secondary				
		Improve Patient Health Outcomes	$\checkmark$					
		Improve Patient Experience	$\checkmark$					
		Improve Physician Experience						
		Reduce Costs		✓				
	•	Project design: Patients were not involv	ved in the design of t	his project.				
	•	Project Implementation: Patients were	given a pamphlet w	hich explains the risks	associated with			
Patient		having an incorrect penicillin allergy lal	bel. Offered every pa	itient with the label an	opportunity to			
Participation		evaluate their label and be referred to	an allergist for testin	g. Questionnaires wer	e used to			
		determine likelihood of patients having	a true allergy.					
	•	Project outcome measure (e.g., satisfac	ction): Informal feed	back.				
ACHIEVEMENT O	FQ							
	≻	Measured: Improving appropriateness	and effectiveness of	f care by ensuring that	those who aren't			
Improved Patient		truly allergic can get penicillin, a more	effective antibiotic. A	Able to give more patie	nts the best care.			
Health Outcomes		Approximately 35 patients have been o	ie-labelled so far.	· · · · · · · · · · · · · · · · · · ·				
	>	Perceived: Patients who are de-labelled	d will be able to get f	irst line antibiotics for t	the rest of their			
Improved Dationt	~	Nessured: Improving their potential health of	outcomes permanen	lly. I far this project				
Experience		Bersolved: Datients gave positive infer	e was not measured	tior this project.	a laballing			
Experience		Measured: Improved physician experie		ad for this project	e-labelling.			
Improved		<b>Perceived:</b> Increased awareness of per	vicillin allergies. Phys	icians who are not alle	raists can more			
Physician		essily de-label nations without needin	a to refer them Can	prescribe first-line ant	ibiotics more			
Experience		often reducing complications associat	ed with second-line a	antihiotic use	ibiotics more			
		Measured: Cost savings were not measured	sured for this project					
	>	<b>Perceived:</b> Penicillin is cheaper and mo	re effective than oth	 er options. By being al	ole to prescribe			
Reduced Costs	-	penicillin more widely, the costs associ	ated with prescribing	a second line antibiotic	s (more			
		expensive) is reduced.	···· · · · · · ·	<b>,</b>				
SPREAD AND SUST	AIN	ABILITY						
Sustainability	•	Sustainability: Project has been sustain	ed in the Sexually Tr	ansmitted Infection cli	nic where it			
and Spread		originated.						
		<b>Spread:</b> The guestionnaire developed a	as part of this project	is being coded into the	e app called			
		Spectrum, which is intended to help nh	vsicians working wit	h infectious diseases to	o determine			
		whether patients are truly allergic to pe	enicillin without havi	ng to refer them all to	an allergist.			

Case Study #15: Pe	enici	llin De-Labelling for Pregnant Women				
Case Study #15: Pe Case Study Methodology Background	enici	<ul> <li>illin De-Labelling for Pregnant Women</li> <li>Interviewed a physician lead in charge of the project development and implementation.</li> <li>Reviewed documents and files associated with the project, including:         <ul> <li>Article on SSC website: https://sscbc.ca/news/2020/10/30/doctors-unite-fight-incorrect-diagnoses-penicillin-allergy</li> <li>Allergy de-labelling clinic pamphlet: http://www.bcwomens.ca/Pregnancy-Prenatal-Care-Site/Documents/Penicillin%20De-Labelling%20Clinic%20Communication.pdf</li> <li>Penicillin allergy brochure: http://www.bccdc.ca/about/news-stories/stories/penicillin-allergies-are-rarer-than-you-think</li> <li>Featured researcher article on lead physician: https://obgyn.ubc.ca/featured-researcher-dr-chelsea-elwood/</li> </ul> </li> <li>10% of patients in BC's medical system believe they're allergic to penicillin, but 90% of those patients are mistaken. Having the allergy label leads to prescribing second line antibiotics, which may not be the best option for patients, and is a more expensive treatment. For pregnant patients who may need antibiotic intervention during childbirth, it is essential to be able to give them the best care</li> </ul>				
		through penicillin. De-labelling as man	y patients who do no	ot have a true allergy as	s possible is	
Objectives	•	necessary to provide the best care. <b>Objective Statement:</b> Create a process to test and de-label patients with the penicillin allergy label to de-label those who do not actually have a penicillin allergy. Aim is to have greater than 90% of patients' allergy statutes clarified				
		Objectives	Primary	Secondary		
		Improve Patient Health Outcomes	✓			
		Improve Patient Experience		$\checkmark$		
		Improve Physician Experience		$\checkmark$		
		Reduce Costs	$\checkmark$			
Patient	•	Project design: Patients were not involved	ved in the design of t	his project.		
Participation	•	Project implementation: Patients were	involved in discussio	ns at the clinic about t	heir allergy label.	
	•	Project outcome measure (e.g., satisfa	ction): Not measured			
ACHIEVEMENT O	FQ	UADRUPLE AIM				
Improved Patient Health Outcomes	AAA	<ul> <li>Measured: Improved appropriateness of care: 100% of women who came through the clinic and had their allergy label clarified who were able to receive penicillin during labor did receive it.</li> <li>Improved effectiveness of care: By removing an unverified penicillin allergy, the project has increased the number of maternity patients who receive the most effective, safe, and evidence based antibiotic regimen at delivery.</li> <li>Perceived: Patients who have been de-labelled are able to get first-line penicillin antibiotic treatment for the rect of their lines.</li> </ul>				
Improved Datient	$\triangleright$	Measured: Improved patient experience	ce was not measured	for this project.		
Experience	≻	Perceived: Penicillin de-labeling can lea	ad to shorter hospita	l stays, a reduced num	ber of	
		complications, and overall smoother ex	xperiences during ch	ildbirth.		
Improved		Measured: Improved physician experie	ence was not measure	ed for this project.		
Physician	~	Perceived: Increased awareness aroun	d allergy de-labelling	, neiped physicians as	sess and de-label	
Experience	D	Measured: Cost savings were not measured	sured for this project	their patients.		
Reduced Costs	~	<b>Measured:</b> Cost savings were not measured for this project. <b>Perceived:</b> By reducing the amount of second-line, more expensive antibiotics that are prescribed, the project has achieved significant cost savings.				
SPREAD AND SUST	AIN	ABILITY				
Sustainability	•	Sustainability: Project is still ongoing d	ue to the COVID-19 p	andemic slowing dow	n progress, but the	
and Spread		new protocol around de-labeling has b	een adopted.	-		
	•	<b>Spread:</b> Changing standards nationally guidelines on penicillin allergy de-label being coded into the spectrum app.	in BC and other prov lling. Findings have b	vinces. Working to cha een published in a me	nge international dical journal. Also	