

## ORIGINAL RESEARCH


# Barriers and facilitators to continuous quality improvement engagement among rural physicians in British Columbia, Canada: a mixed-methods study

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## ABSTRACT

**Introduction:** Rural physician engagement in continuous quality improvement (CQI) activities is vital to improving quality of care, patient safety, and healthcare delivery efficiencies. However, there is a lack of evidence surrounding the barriers and facilitators to CQI uptake across rural medical practices. This study aimed to explore enablers and barriers to CQI implementation and identify ways to foster greater engagement of rural physicians.

**Methods:** A mixed-methods triangulation study design was undertaken encompassing a survey and focus group interviews with physicians practising in rural communities of British Columbia, Canada.

**Results:** The survey was distributed to 1584 rural physicians, and 299 responses were received (response rate of 19%). Seven focus groups were conducted with 33 participants. Survey respondents indicated strong support towards CQI and the benefits of

improved patient outcomes and practice quality. Less than half (47%) of respondents had participated in a CQI initiative within the previous 2 years. Key barriers to CQI engagement included time constraints, limited knowledge of CQI principles, and a lack of understanding of accessing and using relevant data. Key motivators for CQI engagement were opportunities for peer collaboration and receiving practice improvement feedback. Key enablers included more usable and accessible data and appropriate staffing resources to assist with undertaking CQI activities.

**Conclusion:** Given rural physicians' time demands, better support systems are required to enhance rural physician engagement in systematic CQI activities. Specific support areas include dedicated CQI staff resources and better practice data systems and processes to support CQI initiatives.

### Keywords:

Canada, continuous quality improvement, focus group, rural physicians, mixed methods, survey questionnaire.

## FULL ARTICLE :

### Introduction

Continuous quality improvement (CQI) has received considerable attention within health care as a way to enhance quality of care, improve outcomes, and reduce costs<sup>1,2</sup>. CQI describes the process of improving patients' safety, experience, and health outcomes by systematically addressing individual and organizational processes<sup>3</sup>. The Institute of Medicine has defined quality as the extent to which health care is safe, effective, involves users, is continuous, coordinated, efficient, and fairly distributed<sup>4</sup>. A review of the key characteristics of CQI in health care identified three essential elements: systematic data-guided activities, iterative development and testing processes, and designing with local conditions in mind<sup>2</sup>. Many frameworks for improvement methodologies in health care exist with some common ones including lean management, Six Sigma, Plan-Do-Study-Act cycles, and root cause analysis<sup>2,5</sup>. The central tenet across all CQI methodologies is an emphasis on using carefully chosen measures to understand the variation within a system, removing unwarranted variation, and improving system performance through a series of iterative tests of change<sup>5</sup>. Engaging physicians in CQI activities is essential to improving health care, enhancing patient and provider experience, and reducing the cost of care<sup>6</sup>.

Several factors are believed to support the implementation of successful CQI initiatives in health care, including identifying specific and measurable goals to guide action, planning processes for evaluation, measurement setting, continually assessing performance, planning changes where improvements are warranted, and refining goals as needed<sup>6-10</sup>. In a comprehensive review of published literature on contextual factors influencing CQI success, Kaplan et al found that organizational characteristics (eg size, ownership, and teaching status), organizational culture, years involved in CQI, and data infrastructure were key factors that influenced CQI success<sup>11</sup>. However, while much work has been conducted across more extensive organizational healthcare settings and environments, there is comparably little evidence about how initiatives are implemented successfully and sustainably in smaller subsets of the medical community, specifically rural and remote physician practices<sup>1,7,12,13</sup>. There have been calls for a greater understanding of the barriers and facilitators to meaningful CQI adoption and implementation in rural medical practice<sup>12</sup>.

Physicians providing healthcare services in rural and remote settings face unique challenges in engaging with CQI initiatives, given their geographic isolation and more limited access to support personnel and resources. It has also been suggested that physicians in small office settings, such as those in rural practices, may possess a limited and highly variable understanding of quality, and the heavy and stressful clinical workload with many work hours and other conflicts may potentially obstruct engagement in CQI work<sup>14,15</sup>. Deilkås et al highlight that many workplaces, including rural practice, do not recognize the need for support nor offer support to physicians who wish to engage in CQI work<sup>14</sup>.

There is a lack of understanding about how CQI may be best supported and fostered across rural medical practices, despite evidence that CQI work involvement may improve working conditions, the performance and professional fulfillment of physicians and possibly other staff<sup>14</sup>. Wolfson et al indicate that the benefits of engagement with CQI work include greater practice efficiency, patient and staff retention, and higher staff and clinician satisfaction with practice<sup>15</sup>. Small practice size, as found in many rural communities, may also be advantageous in CQI work when implemented correctly in that they mitigate the need to gain buy-in from many different participants, permit greater flexibility, and facilitate the formation of a cohesive microsystem<sup>15</sup>. Generally, there has been a lack of clarity on the best ways to engage and support rural practices in CQI initiatives.

Since 2010, the province of British Columbia in Canada has made participation in accredited continuing professional development (CPD) a revalidation requirement for all physicians to retain a licence to practice. There is no specific requirement for CQI but, because of the Cochrane Report, British Columbia prioritized quality assurance through provincial privileging, which aims to bring consistent-wide practice expectations for medical staff seeking privileges within British Columbia's health authorities<sup>16</sup>. This report highlighted issues surrounding the quality of diagnostic imaging across several health authorities in British Columbia and raised implications for CQI among rural physician practices. During this time, several organizations supported practice and quality improvement through coaching support programs, data dashboards using electronic medical records, and coaching and mentorship programs to enable CQI.

The purpose of this study was to explore enablers and barriers to engagement with CQI and identify ways to foster rural physicians' engagement with CQI.

## Methods

A rural CQI needs assessment study was designed and conducted by the University of British Columbia's Rural Continuing Professional Development team in collaboration with the Rural Coordination Centre of British Columbia. The program is committed to improving rural patient health and the retention of skilled rural practitioners by supporting the unique learning needs of rural physicians and other rural healthcare professionals in British Columbia through high-quality and innovative CPD. A mixed-methods triangulation study design, also known as concurrent triangulation design, was undertaken, encompassing a survey questionnaire and focus group interviews to collect quantitative and qualitative data simultaneously<sup>17</sup>. The triangulation approach encompassed a one-phase design in which quantitative and qualitative methods were administered concurrently but separately, during the same timeframe, with equal weighting, and intended to complement each other. During the interpretation stage, the quantitative and qualitative data were merged so the research team could triangulate how the results related to and informed each other. This study was also informed by the Model of Understanding Success in Quality framework<sup>11</sup>. The framework outlines a range of contextual factors/domains that can influence the effectiveness of CQI activities, including the team, microsystem, supports, organization, and environment. By tracing the relationships between factors, the model allows for an in-depth understanding of how context impacts the effectiveness of CQI and provides a framework for guiding application and research<sup>11</sup>.

A 27-item, web-based survey comprising Likert-style, closed-ended item types (1, 'definitely disagree' to 5, 'definitely agree') and open-ended questions was distributed to family physicians and specialists providing care in rural and remote communities of British Columbia. To ensure study participants were familiar with CQI concepts, definitions and examples of CQI activities were included at the beginning of the survey (Appendix I). The survey was distributed using the FluidSurvey platform between March and May 2017 with the assistance of the Doctors of BC and the Northern and Isolation Travel Assistance Outreach Program. Survey questions were reviewed for face and content validity by a project advisory committee, including rural physician representatives, and a draft version of the survey was piloted with a small sample of rural physicians. Survey questions covered facilitators and barriers, attitudes and practices, meaningful use of practice data/clinical information, practice improvement/quality improvement (PI/QI) and CPD, PI/QI and the provincial privileging and credentialing system for facility or hospital-based practice, organizations involved in PI/QI, and demographics (Appendix I). Survey responses were analyzed using SPSS v17.0 (IBM Corp; <https://www.ibm.com/products/spss-statistics> [<https://www.ibm.com/products/spss-statistics>]) and descriptive statistical analyses. Likert-style questions were collapsed and analyzed using a three-point Likert scale (1, 'disagree' to 3, 'agree'). Cross-tabulations and  $\chi^2$  statistical analyses were conducted to examine the effect of demographic variables (eg region, compensation model, gender, and duration in practice) on item responses.

Focus group interviews were conducted between September 2017 and January 2018 and included seven distinct focus groups comprising representatives from the following groupings: fee-for-service (FFS), alternative payment plan (APP), rural specialists, facilities-based, team-based, physician program leaders, and program regulators. Modified focus group question scripts were used for each group, and respondents received these questions in advance (Appendix II). Focus groups were 90 minutes in length and conducted using the WebEx web-conferencing system and/or a teleconference dial-in option. Responses were recorded and transcribed, and data were tabulated, summarized, and analyzed for patterns or emergent themes. Researchers created a codebook via iterative development, and transcripts were coded independently by research team members and then discussed and condensed into thematic categories. NVivo v11 (Lumivero; <https://lumivero.com/products/nvivo>) was used to organize and group data and apply units of analysis. The study was undertaken with guidance from an advisory committee, which included broad stakeholder representation from members of the target audience, rural medical educators, representatives from British Columbia health authorities, Doctors of BC, and the Rural Coordination Centre of British Columbia.

## Ethics approval

Ethics approval was received from the Behavioural Research Ethics Board, University of British Columbia, #H16-01508.

## Results

### Survey results

A total of 1584 physicians were sent requests to complete the survey, and a total of 299 responses were collected, which resulted in a response rate of 19%. Survey respondents' characteristics suggest that a representative sample of British Columbia rural physicians responded based on practice type, clinical setting, electronic medical record (EMR) usage, and community of practice. A majority ( $n=106$ ) of the respondents reported they primarily practised as family physicians (FPs) or GPs, with 58 respondents reporting to practise as a specialist. Over 71% of respondents completed medical training in Canada, whereas 29% were international medical graduates. Twenty-nine percent of respondents graduated in the previous 5 years and 20% graduated more than 20 years ago (Fig1).

The majority of respondents (76%) indicated they practised in a community with a population of less than 30 000 (Table 1) and a majority (70%) reported working in a rural or remote community of British Columbia for more than 5 years.

A majority of respondents (66%) indicated their scope included 'family practice', followed by 'emergency medicine' (41%), with 61% reporting they primarily worked in a 'primary care office or clinic' and 28% primarily practising in a hospital. A majority (77%) also reported working within a 'group practice setting' with other physicians, and 80% reported that their primary source of professional income came from 'fee for service'. Eighty-five percent (85%) of respondents used an EMR to do clinical practice, with the most common platforms being MOIS (18%) and Med Access (18%), followed by IntraHealth (14%), Oscar (9%), Wolf (9%), and Osler (7%). Less than half of respondents (42%) indicated that they had participated in a CQI initiative within the previous 2 years and a majority (82%) agreed that their participation in CQI activities

was valuable for patient care. A smaller proportion indicated satisfaction with their current level of involvement (24%) (Table 2).

A 'lack of time' was the most frequently cited barrier among 90% of respondents (Table 3). Other key barriers to CQI participation identified by over half of respondents included lack of access to useful externally generated data (62%), lack of incentives (58%), limited knowledge of CQI principles and application (52%), and limited knowledge of how to track patient outcomes over time (51%). Interestingly, questions about access and/or use of data sources for CQI were answered with 'I don't know' much more frequently than other questions.

GPs/FPs were more likely than specialists to indicate that 'access' to EMR-type clinical data ( $\chi^2(2)=15.95; p<0.01$ ) and the 'usability' of available EMR data ( $\chi^2(2)=7.00; p<0.05$ ) were barriers to CQI. Respondents in smaller communities were less likely to utilize public health/disease surveillance data for CQI than their colleagues in larger centres ( $\chi^2(1)=15.47; p<0.01$ ). Further, international medical graduates were more likely to indicate that a lack of knowledge regarding CQI principles was a barrier to their involvement than those trained in Canada ( $\chi^2(2)=6.76;$

$p<0.05$ ). More than 80% of respondents agreed that the following factors were motivators to their participation in CQI activities: potential to produce improvement in patient outcomes, potential to improve knowledge base and quality of practice, ability to collaborate with colleagues/other healthcare professionals to provide better patient care, and continuing medical education (CME) credits (Table 4).

Respondents were quite favourable ('agree' and 'definitely agree') to the 'provision of incentives' and 'easy access to practice data or clinical information' (78% and 76%, respectively). Other items receiving very favourable ratings ('agree' and 'definitely agree') included 'access to a PI/QI coach, champion or mentor for support' and 'being able to compare practice data with summary of their peer's data' (54% and 58% of all respondents agreed, respectively) (Table 4). Chi-squared analysis of CQI enablers and demographic characteristics showed that GPs/FPs were more likely than specialists to agree that provision of incentives was a motivator to CQI participation ( $\chi^2(2)=8.50; p<0.05$ ). Further, Canadian medical graduates were more likely than international medical graduates to agree that the provision of CME credits was an effective motivator for CQI engagement ( $\chi^2(2)=6.26; p<0.05$ ).

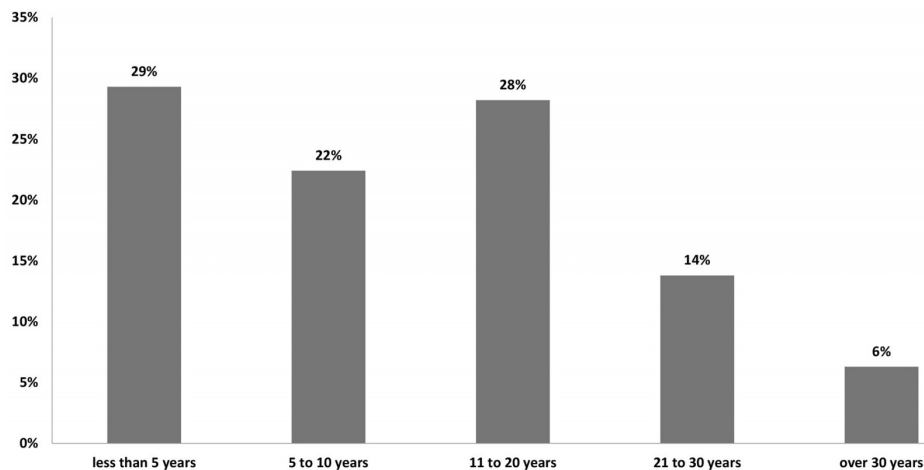


Figure 1: Years since graduation of rural physician survey respondents.

Table 1: Population size of community of practice (n=270)

Population size	n (%)
<1000	8 (3.0)
1000–2999	20 (7.4)
3000–4999	28 (10.4)
5000–9999	44 (16.3)
10 000–29 999	105 (38.9)
≥30 000	62 (23.0)
Don't know	3 (1.0)

Table 2: Current attitudes and agreement with practice improvement/quality improvement capability

Factor	n	Disagree (%)	Neutral (%)	Agree (%)
My participation in PI/QI activities will be valuable for improving the care of my patients	262	2	17	82
I am satisfied with my current level of involvement in PI/QI activities	263	30	46	24
I am satisfied with my current level of knowledge of PI/QI principles	260	36	44	20

PI/QI, practice improvement/quality improvement.

**Table 3: Barriers to participation in practice improvement/quality improvement activities**

Factor	n	Definitely not (%)	Disagree (%)	Neutral (%)	Agree (%)	Definitely agree (%)	Don't know (%)	Weighted mean (/5)
Time constraints	256	2	1	7	24	66	0	4.5
Lack of incentives (eg payment for time spent participating in PI/QI activities)	296	4	9	29	28	28	2	3.6
I have limited knowledge of PI/QI principles and how to apply them practically	297	5	11	32	33	18	1	3.4
I don't know how to measure or track patient outcomes over time	297	6	15	27	31	20	1	3.4
I don't know how to access practice data/clinical information	297	7	15	28	27	21	3	3.3
Lack of access to useful externally generated data (eg hospital or MSP data)	296	1	12	22	31	23	12	3.2
I don't have access to practice data/clinical information	297	6	19	34	20	15	6	3.0
My EMR data are not in a useful format	295	9	22	20	17	17	16	2.6
My EMR-generated reports are not useful	297	8	20	22	15	15	20	2.5

EMR, electronic medical record. MSP, Medical Service Plan. PI/QI, practice improvement/quality improvement.

**Table 4: Motivators to participation in practice improvement/quality improvement activities**

Factor	Definitely not (%)	Disagree (%)	Neutral (%)	Agree (%)	Definitely agree (%)	Don't know (%)	Weighted mean (/5)
Potential to produce improvement in patient outcomes	0	0	2	27	71	0	4.7
Potential to improve my knowledge base and quality of practice	0	1	5	30	64	0	4.6
Ability to collaborate with colleagues/ other healthcare professionals	1	2	12	46	39	0	4.2
Continuing Medical Education credits	3	3	10	37	46	1	4.2
Provision of incentives (eg payment for time spent participating in PI/QI activities)	2	3	16	33	45	1	4.1
Easy access to practice data/clinical information	1	6	15	35	41	2	4.0
Having support to summarize practice data/clinical information	2	8	26	34	29	1%	3.7
Being able to compare my practice data to the summary of my peers' practice data	4	10	26	37	21	2	3.6
Access to a PI/QI coach, champion or mentor for support	5	13	27	31	23	1	3.5

PI/QI, practice improvement/quality improvement.

**Focus group results**

Each focus group interview had four to six participants, for a total of 33 respondents (Table 5).

**Table 5: Focus group inclusion criteria**

Focus group type	n	Inclusion criterion
FG3a: Fee-for-service	5	Physicians being paid on provincially governed fee-for-service agreements
FG3b: Alternative payment plan	4	Physicians being paid on non-standard agreements (including but not limited to sessional, service contract, salary)
FG4: Rural specialists	4	Physicians registered with College of Physicians and Surgeons of British Columbia providing specialist services in rural British Columbia communities
FG5: Facilities-based	4	Physicians practising in hospitals, community care centres, or other governed care facilities
FG6: Team-based	5	Physicians and other healthcare providers who practise as part of an interdisciplinary care team
FG7: Physician program leaders	5	Physicians who are, or have been, actively involved in implementing and/or leading PI/QI initiatives
FG8: Program regulators	6	Physicians working for the provincial government, a health authority or other regulatory body that actively participates in the regulation of PI/QI initiatives

PI/QI, practice improvement/quality improvement.

Focus group respondents described various CQI initiatives they currently engaged in, as well as their level of satisfaction with such initiatives, and level and quality of CQI initiatives available. A significant motivator to engaging in CQI activities was the ability to collaborate with colleagues and receive useful and actionable feedback regarding practice habits and areas of improvement. One important aspect of this was the ability to reflect upon one's practice-level data, compare with one's colleague or with data

from their community/region/province, and thereby gain a better sense of what is currently working and what could use improvement. These viewpoints were also supportive of survey responses as over 80% of survey respondents agreed that a key motivational factor for participating in CQI included the potential to produce improvement in patient outcomes, improve knowledge and quality of practice, and collaborate with colleagues/other healthcare professionals to provide better patient care.



Respondents also highlighted the importance of the CQI process occurring in a safe environment focused on learning and improvement.

*As a physician we often expect perfection from ourselves, and so being in a place where we can say we're not perfect but we're getting better is so important, ... it's actually okay if we've not made it and way better to figure out why we've not made it than to just ignore the fact that we've not made it. (FG7: program leader respondent)*

The types of initiatives and involvement described were diverse and influenced by the context of one's practice. Practice and clinical support resources such as 'practice coaches' were frequently described. Intercollegial or interprofessional practice rounds, or 'morbidity and mortality' type discussions, were common examples. Other care team members were considered vital in CQI initiatives, including allied healthcare providers, administrative staff, and patients. A key facilitator to CQI engagement was a 'team-based' approach that could occur in the context of interprimary care providers and coordinated care models. This sentiment was also supported by survey results in which most respondents reported a preference for team-based CQI activities (63%), especially among GPs/FPs and those practising in smaller population communities.

*We have real in-time quality improvement in that we don't work in silos in our clinic. We've actually structured the clinic so that we can have maximum crossover between the different providers. (FG6: team-based respondent)*

Despite the array of currently available CQI initiatives and resources and the seemingly high level of current engagement, nearly all respondents indicated room for improvement. Areas in which CQI professional development was considered a priority encompassed 'social determinants of health', including 'mental health', understanding 'adverse childhood experiences' and 'culturally safe care for Indigenous patient populations'. Another crucial professional development area was the effective use of CQI resources/tools.

*I think from an educational perspective, there's some formal training for physicians to learn how to use QI, [but] I think very few physicians will go on that option. I think most of where the education needs to be based is on trying to teach physicians when they do take projects, it's just coaching them on how to use different tools effectively. (FG8: program regulator respondent)*

A number of barriers and enablers to engaging with meaningful CQI initiatives were identified, including time, compensation models, knowledge, sustainability and accountability, and regulatory authority approaches. Time constraints were a prevalent barrier to engagement with CQI initiatives and the most frequently cited barrier among over 90% of survey respondents. Between clinical duties, personal needs, and the diverse array of other responsibilities, carving out the time to engage in CQI was challenging.

*I mean time is always a factor in these things and a lot of times we're so busy in what we do we just want to escape from what it is we're doing to give ourselves a break from that which is causing us immense stress. (FG8: program regulator respondent)*

Many respondents indicated that having CQI directly integrated into their workflow would greatly improve their engagement and satisfaction.

*Having it consciously scheduled into your practice clinical routine I think are keys to making it just a part of your everyday practice versus as a chore. (FG3a: FFS respondent)*

Time was also connected to and influenced by compensation models, with traditional FFS payment inhibiting time commitment to engage in non-compensatory CQI activities. Respondents discussing APP models (eg salary, sessional, service contract) did affirm they were better able to allocate resources (including time and energy) to other areas, including CQI.

*I do think the APP model allows for quality improvement well. You can initiate quality improvement trials which may or may not be successful without fear for the bottom line and I think that opens up a lot of freedom to be able to try things out ... I think the APP model does support that kind of quality improvement. (FG3b: APP respondent)*

Lack of knowledge was another barrier to meaningful CQI engagement, including how to identify areas of potential need for improvement and develop ways to address these areas. Survey respondents reported that the most popular topics for CPD included identifying and addressing quality gaps in practice (85%), generating meaningful/useful reports from practice data (80%), understanding how to do CQI (76%), and being able to accurately enter data into their EMR in a usable format (67%). Notions of sustainability and accountability were also discussed, with focus group respondents identifying the need for support to foster the longevity of initiatives and ensure that newly acquired skills, competencies, or other practice improvements were not lost. These findings also reflected survey responses – while survey respondents identified the potential benefits of CQI and were interested in incorporating it into their practice, a majority reported not having the tools and know-how to do so.

*I think all of us when we begin on our practice improvement projects, we all have the best of intentions to complete it but six months rolls around and it just hasn't and it's not that we don't view it as important, it's how do we continue to make it a priority throughout the course of our regular working day and that's the challenge. (FG3a: FFS respondent)*

Respondents reported that being accountable to colleagues and others engaging in similar CQI projects was a powerful tool for enhancing CQI success. They also indicated that having a local CQI champion responsible for fostering these kinds of initiatives could encourage greater adoption.

*One of the most important aspects of this process to me is the relationship between the trusted advisor or mentor and a physician to hold the physician accountable for some of the quality improvement projects that they're doing. (FG8: program regulator respondent)*

Physician respondents discussed the need to separate practice assessment from quality improvement and enable a greater culture of independent CQI in which quality improvement could be pursued in a safe, non-punitive environment. In this regard, regulatory authorities were identified as a potential challenge as such organizations approach quality with a quality assurance lens

rather than an improvement lens. When this kind of quality check is conducted outside a safe, non-punitive environment, it risks interfering with meaningful practice improvement.

Another key thematic category from the focus group analyses was the significance of technologic systems and data availability to engage in quality improvement. Key emerging subthemes included accessibility, EMRs, support, and data quality. Respondents agreed that having access to practice-level and regional/provincial-level data was invaluable. Ideally, access to readily available, helpful, and intuitive data would be most beneficial. However, aside from data that might be available through an EMR system, there were reported experiences of challenges and difficulty in accessing data from other sources. Respondents felt most of the data they could access could only be obtained through a laborious self-initiated process. As such, respondents indicated a preference for data that was pushed to them and which they could decide whether to use.

*It needs to be made easy and with that push aspect once the clinical question is asked in terms of easily accessing the data and then that sense of collaboration with others to discuss and review and talk about strategies. (FG3a: FFS respondent)*

Respondents reported that, despite some drawbacks to EMR-type data systems (namely, lack of interoperability and the burdensome task of data entry), these did provide a potentially important source of practice-level data. However, it was noted that a large subset of physicians either did not know how or did not have time to extract data from their EMR systems in a format that would lend itself to any kind of meaningful CQI.

*Very few physicians know how to meaningfully pull the data out of their local EMR and run reports, do run times, look at any indicators ... I think really being intentional about supporting physicians using those data sources and making the usability of the local EMR's better at being able to run the reports is quite key. (FG7: program leader respondent)*

Another key way to enable and empower rural physicians in CQI engagement was through better data support, such as dedicated personnel to assist with data management, entry, processing, analyzing, summarization, and extraction. The quality of the data was also identified as important, with critical criteria including parameters/consistency, applicability/context-dependence and the type of data collected. Survey respondents also indicated strong support (82%) for individual physician ownership over practice-level data; a majority reported a preference for more significant support in interpreting and applying their data (64%).

## Discussion

This study aimed to explore enablers and barriers to engagement with CQI and identify ways to foster the engagement of rural physicians. The majority of respondents reported a positive attitude towards participating in CQI activities, agreed that participating in these activities would be advantageous for improving the care of their patients, and indicated a strong desire to learn more about CQI. A majority also showed strong support for exploring 'how their workplace could better support their involvement in CQI activities', as well as 'their readiness to participate in a self-directed or team-based continuous QI'. However, a low percentage of respondents were satisfied with their current knowledge of CQI principles or their current level of involvement in CQI activities, with only half having initiated or

participated in any CQI activity in the preceding 2 years. Several barriers were identified, with 'time constraints' being the most frequently cited by a large majority. Deikàs et al also found that physicians were highly interested and wanted to participate in CQI work. However, active participation was significantly related to their work-hour schedule's designated time for quality improvement<sup>14</sup>. Physicians with designated time participated substantially more. When the time was designated, 86.6% of the physicians reported participation in CQI, compared to 63.7% when the time was not specifically designated<sup>14</sup>. Similarly, Wolfson et al found that physicians in small-to-moderate primary care practices in the US faced comparable challenges in implementing CQI initiatives, including time constraints, cost of activities, limited resources, small staff, and inadequate information technology systems<sup>15</sup>.

In the present study, incentives emerged as an essential motivator for respondents' participation in CQI, with a majority indicating 'provision of incentives' as a motivator for CQI practices. These incentives may take various forms, including creating the space (eg time), being better equipped (eg training, access to data) for CQI activities, and trying to streamline CQI into existing workflow. CME credits were also identified as an important motivating factor. Further, having CQI activities embedded within an interdisciplinary, team-based approach strongly motivated our survey and focus group respondents. This is a well-known contributor to a thriving CQI culture<sup>6,7</sup>, so tailoring opportunities to engage in meaningful CQI with multidisciplinary colleagues may be vital to ensuring the success and longevity of initiatives in rural communities. Wolfson et al also found several facilitators to CQI engagement, including the designation of a practice champion, the cooperation of other physicians and staff, and the involvement of practice leaders<sup>15</sup>. Like our findings, financial incentives were not found to be a significant motivating factor in the study by Wolfson et al in which physician respondents reported stronger intrinsic professional motivations towards CQI engagement in order to increase performance levels<sup>15</sup>.

Since microsystem-level attitudes, motivation, and CQI capabilities are central to CQI success, it will be critical to provide physicians with the support, tools, and resources required to translate their desire and amenability to CQI into a practical and sustainable CQI culture<sup>9,10</sup>. One of the significant tools highlighted in our investigation was 'practice data'. Respondents indicated that the use of such data would be beneficial to CQI initiatives, yet respondents also indicated a lack of knowledge about how to access and use or interpret this kind of data. This suggests a potentially beneficial avenue for the development and implementation of support systems and personnel dedicated to the collection, interpretation, and appropriate dissemination of this kind of data, which has previously been suggested to be beneficial to physician CQI<sup>6,11</sup>.

The study findings suggest a strong willingness and motivation among rural physicians to participate in CQI. Although respondents were aware of the potential benefits of CQI and were interested in incorporating it into their practice, they did not have the tools or know-how to translate CQI principles and practice into action, which presented an opportunity for continuous learning and development. Shojania et al suggest CPD can play an essential role in imparting concepts and methods of CQI to physicians, with better outcomes realized when they receive individualized coaching, performance data, or process improvement tools, such

as educational material for patients and decision support for clinicians<sup>18</sup>.

The findings of this needs assessment study have been used by a British Columbia Joint Standing Committee on Rural Issues to advocate for further support of rural physicians with CQI initiatives. The Joint Standing Committee receives funding from the British Columbia Ministry of Health and Doctors of British Columbia and is a critical group in British Columbia that oversees rural health issues on behalf of rural physicians. Fundamental changes that have emerged include more funding for new family physician payment models that reimburse time commitments to CQI work, increased funding for more accredited CPD practice improvement programs, including coaching and mentoring, and concierge services for rural physicians. The concierge-type support service provides more significant support to rural physicians interested in undertaking CQI in their practices by matching the most appropriate programs, tools, or initiatives to meet their needs.

A key limitation to the study findings reported here may be the respondent sample size. However, the survey respondents' sample was representative of the general demographic characteristics of

British Columbia, Canada's rural physicians based on type of practice, clinical setting, EMR usage, and location. Overall, enablers to greater rural physician participation in CQI appear to include better support on how to initiate and sustain CQI activities, embed these initiatives within the context of rural practice, manage time constraints, and translate trusted practice data into meaningful change. Future research that evaluates practical approaches for supporting and fostering rural physician engagement in CQI activities would contribute to a better understanding of ways to promote implementation and sustain CQI in rural medical practice.

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#### Conflicts of interest

The authors declare no conflicts of interest.

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## Appendix I: Survey questionnaire

### RURAL CONTINUOUS QUALITY IMPROVEMENT (CQI) NEEDS ASSESSMENT

The goal of this needs assessment is to understand what is currently happening, what is required and could be put in place to better support effective practice improvement/quality improvement (PI/QI) in rural and remote physician practices in British Columbia.

For this survey, Practice Improvement (PI) is any activity you are involved with that is aimed at improving your practice. Quality Improvement (QI) refers to PI activities that use a specifically structured approach that includes measurement.

Your input is important and will help shape the future of PI/QI in rural British Columbia, ultimately positively impacting your practice and patient health. It may also help inform what supports are needed and may influence the provincial privileging process and any requirements for continuous quality improvement. Please note that the purpose of this survey is for PI/QI and is not for regulatory, disciplinary or performance assessment. All responses will be reported anonymously and in aggregate fashion only.

The survey will take approximately 15 minutes to complete.

Please note that this survey is targeted at physicians providing care in rural and remote communities in British Columbia.

Upon completion of the survey, you will have the opportunity to enter into a draw to win your choice of one of three prizes: an Apple iWatch- latest model, a case of good quality British Columbia wine or a \$500 Amazon gift card. Winners will be randomly selected and notified on March 31, 2017 and after the survey close date (i.e. April 7, 2017). Those who complete the survey earlier will have an increased chance of winning one of the prizes.

CONSENT: Please note that participation in this survey is voluntary. By completing this survey (i.e. pressing *SUBMIT*), you are providing implied consent for your responses to be collected as data in this study.

There may be minimal risks associated with participation in this study in that you will be invited to generally provide input based on your personal and/or professional experience. Nevertheless, there will not be any individual identifiers in the report(s) of this study. If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance e-mail [RSIL@ors.ubc.ca](mailto:RSIL@ors.ubc.ca) or call toll free 1-877-822-8598.

All data collected in the study will be treated with utmost confidentiality to protect each individual's identity. The data will (i) be accessible to members of the research team only, (ii) be presented in aggregate format only, and (iii) be included in reports with no individual identifiers. Any contact information you provide will be kept separate from your feedback provided.

For more information about this study, please contact any of the study team members listed below.

[Click here if you would like to learn more about PI/QI and see examples of PI/QI activities.](#)

PI/QI is a process by which evidence-based information and interventions are used to help physicians identify patient care areas for improvement and change their practice. A variety of reputable PI/QI activities exist and are designed to help analyze information, measure and sustain change. Some examples of PI/QI activities that you may want to consider while responding to this survey include:

1. Personal learning/improvement plans
2. Group learning (e.g. practice-based small group learning)/improvement plans
3. Self-assessment (e.g. chart review)
4. Mentoring/coaching support for practice change
5. Data collection tools and procedures
6. Formalized feedback on practice
7. Commitment to change and reflection exercises
8. Plan -Do-Study-Act (PDSA) cycles)

#### SECTION A – FACILITATORS AND BARRIERS

1. The following **factors would motivate me** to participate in Practice Improvement /Quality Improvement (PI/QI):

	Definitely Not 1	2	3	4	Most Definitely 5	Don't Know/ Unsure
a) Potential to <b>improve my knowledge base and quality of practice</b>						
b) Potential to produce <b>improvement in patient outcomes</b>						
c) Ability to <b>collaborate with colleagues/other healthcare professionals</b> to provide better patient care						
d) Provision of <b>incentives</b> (e.g. payment for time spent participating in PI/QI activities)						
e) Access to a <b>PI/QI coach, champion or mentor</b> for support						
f) Continuing Medical Education (CME) <b>credits</b>						
g) Easy access to <b>practice data/clinical information</b>						
h) Being able to compare my practice data to the <b>summary of my peers' practice data</b>						
i) Having <b>support to summarize practice data/clinical information</b>						

Additional comments on motivating factors:

2. The following factors are **barriers** to my participation in Practice improvement/Quality improvement (PI/QI):

	Definitely Not 1	2	3	4	Most Definitely 5	Don't Know/ Unsure
a) <b>Time</b> constraints						
b) <b>Lack of incentives</b> (e.g. payment for time spent participating in PI/QI activities)						
c) I have <b>limited knowledge of PI/QI</b> principles and how to apply them practically						
d) I <b>don't have access</b> to practice data/clinical information						
e) I <b>don't know how to access</b> practice data/clinical information						
f) I don't know <b>how to measure or track</b> patient outcomes over time						
g) <b>My EMR data</b> is not in a useful format						
h) My <b>EMR-generated reports</b> are not useful						
i) Lack of access to useful <b>externally-generated data</b> (e.g. hospital or MSP data)						

Additional comments on barriers:

**SECTION B – ATTITUDE AND PRACTICES**

3. Please indicate your **level of agreement** with the following statements:

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5	Don't Know/ Unsure
a) My participation in PI/QI activities will be <b>valuable for improving the care</b> of my patients						
b) I am satisfied with my <b>current level of involvement</b> in PI/QI activities						
c) I am satisfied with my <b>current level of knowledge</b> of PI/QI principles						
d) I would be willing to explore how my <b>workplace can better support</b> my involvement in PI/QI activities						
e) I would be prepared to participate in a <b>self-directed continuous quality improvement process</b> to ensure patient safety and best patient outcomes, if it was appropriately supported						
f) I would be prepared to participate in a <b>continuous quality improvement process with other healthcare professionals</b> in my community to ensure patient safety and best patient outcomes						

Additional comments:

4. I **prefer to participate** in practice improvement/quality improvement (PI/QI) through the following formal approaches:

	Not Preferred 1	2	Somewhat Preferred 3	4	Highly Preferred 5	Don't Know/ Unsure
a) <b>Individual learning and assessment</b> (e.g. personal learning/improvement plans, chart review)						
b) <b>Group learning</b> with other physicians (e.g. small group learning sessions, practice improvement groups)						
c) <b>Team-based practice improvement</b> activities (e.g. improvement activities involving all members of a healthcare team)						
d) <b>Mentoring/coaching support</b>						
e) <b>Audit and formalized feedback</b> from a trusted source						

Additional comments:

5. I have recently (within the last two years) **initiated or participated** in a Practice Improvement/Quality Improvement (PI/QI) activity.
- Yes
- No
6. Please list or describe the PI/QI activities you initiated or participated in **and who was involved**:

**SECTION C – MEANINGFUL USE OF PRACTICE DATA/CLINICAL INFORMATION (E.G. PRACTICE CHARTS, EMR DATA, NATIONAL DATABASES, HOSPITAL DATA)**

7. Please indicate your **level of agreement** with the following statements:

Statements	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5	Don't Know/ Unsure
a) Physicians should be <b>responsible for and control the use</b> of their practice data						
b) I would be willing to have <b>my practice data/clinical information included in a central repository</b> and provided to other physicians as summarized data for the purpose of PI/QI, if it was non-identified and held by a trusted group						
c) I would trust <b>practice data/clinical information summarized</b> by a trusted external source						
d) I am <b>comfortable interpreting and applying findings</b> from my practice data/clinical information for PI/QI						
e) I prefer to have <b>support interpreting and applying findings</b> from my practice data/clinical information for PI/QI						
f) I would be <b>willing to spend some time learning</b> about data management, compiling and interpreting reports, and meaningful practice data measurement						

Additional comments:

8. Please comment on the following with respect to your **access** and **utilization** of data sources for practice improvement/quality improvement (PI/QI):

	I have access to this data source for PI/QI		I utilize this data source for PI/QI		I don't know this data source or haven't thought of using it for PI/QI
	Yes	No	Yes	No	
a) Electronic Medical Records (EMR)					
b) Health Data Coalition (physician-led EMR-based data sharing initiative)					
c) Hospital or facility data					
d) Public health/disease surveillance data (e.g. Pap report cards)					

Additional comments or other data sources you have access to or utilize (e.g. nationally available clinical databases):

**SECTION D – PI/QI AND CPD**

9. I would be **interested in education** on the following topics or areas to support my PI/QI efforts:

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5	Don't Know/ Unsure
a) <b>Entering data into my EMR</b> accurately and in a usable format						
b) <b>Generating meaningful/useful reports</b> of my practice data						
c) Understanding <b>how to do PI/QI</b> in my practice setting						
d) Strategies for <b>identifying and addressing quality gaps</b> in my practice						

e) Leading or participating in <b>team-based PI/QI</b> projects						
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Additional comments or other topics/areas of interest:

**SECTION E – PI/QI AND THE PROVINCIAL PRIVILEGING AND CREDENTIALING SYSTEM FOR FACILITY OR HOSPITAL-BASED PRACTICE**

10. In the context of the new Provincial Practitioner Privileging and Credentialing System ( i.e. Privileging Dictionaries), please indicate your **level of agreement** with the following statement:

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5	Don't Know/ Unsure	Not Applicable
a) The Privileging Dictionaries have had a <b>positive impact on the quality of care</b> I deliver to my patients							

Additional comments on Privileging Dictionaries:

**SECTION F – ORGANIZATIONS INVOLVED IN PI/QI**

11. In your opinion, what role(s) should the following bodies play in setting the PI/QI direction? [For each, **select all that you believe should apply**]:

	Leading	Funding	Developing Content	Delivery & Implementation	Promoting	No role
Individual physicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Doctors of BC (DoBC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Society of GPs (SGP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Specialty Societies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Divisions of Family Practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practice Support Program (PSP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
UBC Faculty of Medicine (i.e. UBC Division of Continuing Professional Development – UBC CPD or other Clinical Departments)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rural Coordination Centre of BC (RCCbc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Joint Clinical Committees (JSC, SSC, GPSC, SCC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ministry of Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
College of Family Physicians of Canada (CFPC)/BC College of Family Physicians (BCCFP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Royal College of Physicians and Surgeons of Canada (RCPSC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
College of Physicians and Surgeons of BC (CPSBC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BC Patient Safety & Quality Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Additional comments:

**SECTION G - DEMOGRAPHICS**

Information collected in this section will help us better understand your context of care. None of the information will be used to identify any individual physician. Your confidentiality will be maintained at all times.

12. I am a:

- GP/FP
- Specialist
- Resident
- Other. Please specify \_\_\_\_\_

13. My **practice includes work** in the following: [Select all that apply]

- A private office or clinic
- Emergency room care
- Long-term care facility
- Walk-in clinic



- In-patient care
- Other. Please specify \_\_\_\_\_
14. My **scope of practice** includes: [Select all that apply]
- Emergency medicine
- Family practice
- Family practice anaesthesia
- Family practice enhanced surgical skills
- Internal medicine
- Obstetrics
- Paediatrics
- Psychiatry
- Radiology
- Surgery
- Other. Please specify \_\_\_\_\_
15. My age is: \_\_\_\_\_ [YRS]
16. I completed my medical training in \_\_\_\_\_ [Please provide country where you completed your medical education]
17. I graduated from medical school in \_\_\_\_\_ [YYYY]
18. My **primary practice location** is in or under the following health authority [Select one]
- First Nations Health Authority
- Fraser Health Authority
- Interior Health Authority
- Northern Health Authority
- Vancouver Coastal/Providence HC Health Authority
- Vancouver Island Health Authority
- Other. Please specify \_\_\_\_\_
19. I practice in a community with a **population size** of: [Select one]
- Under 1,000
- 1,000 to 2,999
- 3,000 to 4,999
- 5,000 to 9,999
- 10,000 to 29,999
- 30,000 and above
- Don't know
20. I currently practice: [Select one]
- Full-time
- Part-time
- Retired
- Locum
- Other. Please specify \_\_\_\_\_
21. I have been providing care in rural and remote communities of British Columbia for [select one]
- Less than 5 years
- 5 to 10 years
- 11 to 20 years
- 21 to 30 years
- Over 30 years
22. I typically spend the following number of **hours per week in direct patient care**: \_\_\_\_\_ [# of HRS/WK]
23. I primarily work in the following **clinical setting**: [Select one]
- Walk-in clinic
- Primary care office/clinic
- Long-term care facility
- Hospital
- Not in clinical practice
- Other. Please specify \_\_\_\_\_
24. In my main clinical practice setting, I work **with the following**: [Select all that apply]
- Other family physicians
- Other specialists
- Nurses
- Nurse practitioners
- Pharmacist
- MOAs
- Other. Please specify \_\_\_\_\_
- Not applicable
25. The professional income from my practice is derived primarily (>50%) from the following payment method: [Select one]
- Fee for service
- Salary
- Population-based blended funding
- Sessional
- Other. Please specify \_\_\_\_\_
26. I **use an EMR** in my practice
- Yes
- No
27. The type of EMR I use is [Select one]:
- IntraHealth
- Med Access
- MOIS
- Oscar
- Osler
- Wolf
- Other. Please specify \_\_\_\_\_

## Appendix II: Focus group questions

### Appendix B: Focus group questions

#### FOCUS GROUP PROTOCOL

FG1: QI Leaders

FG2: Engagement Leaders

#### QUESTIONS

1. Prior to this discussion we have shared with you the questions we intend to ask future focus groups, key informants, and in the survey.
  - a. Is there any feedback overall?
    - i. Could any specific questions be improved? If so, how?
    - ii. Can you think of any important questions we are not asking and should be asking?
  - b. What (if any) additional questions should we be asking each of the proposed focus groups?
  - c. What (if any) additional questions should we be asking in the survey?
  - d. What (if any) additional questions should we be asking key informants?
2. Please refer to the Proposed Focus Groups & Sequencing document (below).
  - a. Is there any feedback on the process of our study in terms of the themes of each focus group and the sequencing of focus groups, the survey, and KIs?
3. How and who should we engage with for the focus groups/survey/key informant interviews?
  - a. We are planning on sending the survey to all physicians who live or practice medicine in an RSA community in BC, or have previously practiced medicine in an RSA community in BC. Should we also include those who have a significant part of practice that involves supporting physicians from RSA communities?
    - i. Should we also send the survey to stakeholders with particular knowledge and understanding of the QI/PI activities in BC, who support QI/PI activities, and/or who support rural physicians?
  - b. Any suggestions for how to compensate participants for the survey (e.g. prize draw, value)?

#### FOCUS GROUP PROTOCOL

FG3 – FG5: Practice-based, specialty-based & facilities-based PI/QI

#### QUESTIONS

1. **Tell us about your experience with PI/QI.**

Probe [PI/QI ACTIVITIES LIST]: What PI/QI activities have you been involved in, are currently involved in or are aware of?

Probe [WHAT WORKS]: What worked well for the PI/QI activities you have been involved in? If you are currently involved in PI/QI activities, what is working well?

Probe [EXISTING SUPPORTS]: What existing supports or resources are you using for PI/QI? *Examples: data analysis support, buy-in from staff and colleagues, in-practice coaching, health authority funding support etc.*

*Probe: How are they effective in meeting your PI/QI needs?*
2. **How might you incorporate PI/QI into your usual workflow or practice?**

Probe [PI/QI IN EVERYDAY PRACTICE]: Does PI/QI currently fit into your everyday practice? If so, how? If not, why not?

Probe [NEEDED SUPPORTS]: What facilitators or supports do you think would be effective in promoting rural physicians' participation in PI/QI activities?

*Examples: Supports may be internal (e.g. allocated staff time for data extraction and analysis) or external to physicians' practices (e.g. funding, built-in/dedicated salary time for PI/QI, access to quality feedback). For both, access to trusted, high quality meaningful data.*

**Note to facilitator: Explore nuances for different remuneration types (i.e. fee-for-service versus alternative payment).**

*Probe: How and by whom would you like these supports to be provided?*

Probe [TIME CONSTRAINT]: Time constraint was one of the barriers identified through the online survey. How would you like to see this barrier addressed?

*Probe: Are there PI/QI activities where you have seen this barrier addressed successfully? If yes, please describe how it was done.*

Probe [OTHER BARRIERS]: Some other challenges identified through the survey were limited knowledge of PI/QI principles and application, and know-how to summarize and interpret data. Can you comment on how these challenges might be addressed?

Probe [OTHER BARRIERS]: Can you identify any other barriers to PI/QI? How might these barriers be addressed?
3. **What are your thoughts on using practice data/clinical information or feedback for PI/QI?**

Probe [DATA SOURCES]: What data sources do you use for PI/QI?

*Examples: EMR data, national datasets, feedback from peers, staff and patients, etc.*

Probe [DATA SOURCE CREDIBILITY]: How do you assess the usefulness and credibility of your data sources?

Probe [DATA SUPPORT]: What specific supports or resources would be helpful to effectively utilize data for PI/QI?

*Examples: funding, data analysis support from coaches, trusted peers, etc. or from administrators or regulators*

Probe [PRACTICE DATA COMPARISON]: Some EMRs have the ability to track and compare data across practices and with your peers. Some have found this helpful. Can you comment on if and how this would be useful for your PI/QI work?

Probe [FEEDBACK FOR PI/QI]: Opportunities to give and receive feedback from colleagues, staff or patients can be helpful for PI/QI. What are your experiences and thoughts on this?
4. **How can CPD and other education resources support your PI/QI participation?**

Probe [TOPICS OF INTEREST]: What topics related to PI/QI would you like to receive education on? *Examples: education on PI/QI principles, identifying areas where quality care could be improved in your practice or in the population, measuring change in practice etc.*

*Probe: How would you like the education to be provided (i.e. delivery format, duration)?*

Probe [VALUE OF HUB]: What is your opinion of the value of a single location (human or electronic) to support your PI/QI efforts (i.e. a hub providing access to a CPD concierge, a robust outline or link to useful learning opportunities, mentors/coaches, tools, repository of PI/QI projects etc.)?

Probe [VALUE OF COACH/MENTOR]: What is your opinion on having a coach, champion or mentor for PI/QI?

*Probe: What might you expect to gain by working with a PI/QI coach, champion or mentor? How could a PI/QI coach, champion or mentor best support your participation in PI/QI?*
5. **Have you been involved in collaborative PI/QI? If yes, tell us about your experience.**

Probe [TEAM-BASED PI/QI]: How do you feel about the opportunity for and value of team-based PI/QI involving (a) other physicians only, (b) multi-professional teams, and (c) representation from other stakeholders e.g. patients?

*Probe: Do you have any safety/vulnerability concerns with team-based PI/QI?*

6. **Are there any other issues related to PI/QI in rural BC that you think we haven't addressed so far that you would like to comment on?**

FOCUS GROUP PROTOCOL

FG6: Team-based PI/QI

QUESTIONS

1. **This focus group is about team-based PI/QI. As a member of an active PI/QI team or working group, can you tell us about your experience with team-based PI/QI?**

Probe [TEAM STRUCTURE AND FUNCTION]: Describe how your PI/QI team functions (i.e. administration, scope, membership, activities etc.)

Probe [WHAT WORKS]: What makes your team effective?

*Probe: What effective aspects would you like to share about team-based PI/QI (e.g. how to engage members, get buy-in from others, make decisions, access supports and resources etc.)?*

*Probe: How do you navigate safety/vulnerability concerns within this team context?*

Probe [EXISTING SUPPORTS]: What existing supports or resources are you using for PI/QI (as a team and individually)? *Examples: data analysis support, buy-in from staff and colleagues, in-practice coaching, access to trusted high quality meaningful data, health authority funding support etc.*

*Probe: How are they effective in meeting your PI/QI needs?*

Probe [PI/QI IN EVERYDAY PRACTICE]: How do your team-based PI/QI activities fit into your everyday practice?

2. **In your opinion, how might rural physicians' be supported to incorporate PI/QI into their usual workflow or practice?**

Probe [NEEDED SUPPORTS]: What facilitators or supports would be effective in promoting rural physicians' participation in PI/QI activities?

*Examples: Supports may be internal (e.g. allocated staff time for data analysis) or external (e.g. funding, built-in/dedicated salary time for PI/QI for facilities-based, access to quality third-party feedback) to physicians' practices, as above – access to trusted high quality meaningful data, access to coaches, mentors, trusted colleagues for support*

*Probe: How and by whom would you like these supports to be provided?*

Probe [TIME CONSTRAINT]: Time constraint was one of the barriers identified through the online survey. How would you like to see this barrier addressed?

*Probe: Are there PI/QI activities where you have seen this barrier addressed successfully? If yes, please describe how it was done.*

Probe [OTHER BARRIERS]: Some other challenges identified through the survey were limited knowledge of PI/QI principles and application, and know-how to summarize and interpret data. Can you comment on how these challenges might be addressed?

Probe [OTHER BARRIERS]: Can you identify any other barriers to PI/QI? How might these barriers be addressed?

3. **What are your thoughts on using practice data/clinical information for PI/QI?**

Probe [DATA SOURCES]: What data sources do you use for PI/QI?

*Examples: EMR data, national datasets, feedback from peers, staff and patients etc.*

Probe [DATA SOURCE CREDIBILITY]: How do you assess the usefulness and credibility of your data sources?

Probe [DATA SUPPORT]: What specific supports or resources would be helpful to effectively utilize data for PI/QI? *Example: funding, data analysis support etc. from trusted colleagues or coaches or from administrators or regulators*

Probe [PRACTICE DATA COMPARISON]: Some EMRs have the ability to track and compare data across practices and with your peers. Some have found this helpful. Can you comment on if and how this would be useful for your PI/QI work?

Probe [FEEDBACK FOR PI/QI]: Opportunities to give and receive feedback from colleagues, staff or patients can be helpful for PI/QI. What are your experiences and thoughts on this?

4. **How can CPD and other education resources support your engagement with PI/QI?**

Probe [TOPICS OF INTEREST]: What topics would you like to receive education for PI/QI on? *Examples: education on PI/QI principles, identifying areas where quality care could be improved in your practice or in the population, measuring change in practice etc.*

*Probe: How would you like the education to be provided (i.e. delivery format, duration)?*

Probe [VALUE OF HUB]: What is your opinion of the value of a single location (human or electronic) to support your PI/QI efforts (i.e. a hub providing access to CPD concierge, a robust outline or link to useful learning opportunities, mentors/coaches, tools, repository of PI/QI projects etc.)?

Probe [VALUE OF COACH/MENTOR]: What is your opinion on having a coach, champion or mentor for PI/QI?

*Probe: What might you expect to gain by working with a PI/QI coach, champion or mentor? How could a PI/QI coach, champion or mentor best support your participation in PI/QI?*

5. **Are there any other issues related to PI/QI in rural BC that you think we haven't addressed so far that you would like to comment on?**

FOCUS GROUP PROTOCOL

FG7: Physician program leaders

QUESTIONS

1. **As a program leader, what are your views on PI/QI?**

Probe [WHAT WORKS]: What is working well (a) system-wide and (b) with respect to specific PI/QI initiatives or activities your organization may be involved in?

*Probe: In your opinion, which existing PI/QI supports or resources are working and which ones are not? How can the resources or supports be improved?*

*Examples: in-practice coaching, health authority funding support etc.*

Probe [TEAM-BASED PI/QI]: What are your thoughts on team-based PI/QI?

Probe [PATIENT MEDICAL HOME AND PI/QI]: What are your views on PI/QI within the context of the Patient Medical Home/Primary Care Home?

*Note: "Patient Medical Home (PMH) is a family practice where patients feel most comfortable to discuss their personal and health concerns... A Primary Care Home (PCH) is a PMHs or networks of PMHs linked with health authority and community agency primary care services for coordinated care." – GPSC, 2015*

2. **What are your thoughts on the provincial quality agenda, particularly the interplay between QA and QI? What organizations/key players should be involved?**

Probe [QI vs. QA]: Quality improvement is often differentiated from quality assurance. What are your views on this differentiation?

Probe [PEER REVIEWS FOR PI/QI]: What are your thoughts on the use of peer reviews for PI/QI?

3. **From a rural perspective, what direction should PI/QI be taking provincially?**

Probe [FUTURE DIRECTION]: What do you envision for PI/QI at the provincial level?

Probe [HOW TO GET THERE]: Considering your vision for PI/QI, what specific strategies are needed to achieve that vision?

*Probe: Who should be involved in developing or mapping out those strategies?*

4. **What would you suggest is the best approach to motivate physicians to participate in PI/QI activities?**

Probe [BARRIERS]: Not surprisingly, time constraint, lack of access to quality data and lack of support/buy-in (at

implementation and system levels) were some of the barriers identified through an online survey disseminated to physicians in rural BC. How might these barriers and other challenges to physicians' participation in PI/QI be addressed?

Probe [NEEDED SUPPORTS]: What facilitators or supports would be effective in promoting physicians' participation in PI/QI activities?

*Examples: funding, built-in/dedicated salary time for PI/QI for facilities-based physicians, access to trusted, quality data sources and feedback on physicians' practices.*

*Probe: How and by whom should these supports to be provided?*

**5. Quality data and education are two resources for PI/QI. How might these resources be provided to physicians?**

Probe [DATA SOURCES]: What data sources do you think should be made available to physicians for PI/QI?

Probe [DATA SHARING]: How might it be best to address physicians' safety and confidentiality concerns with sharing practice data?

Probe [TOPICS OF INTEREST]: What topics would you like to see education for PI/QI on?

*Examples: education on PI/QI principles, identifying areas where quality care could be improved in your practice or in the population, measuring change in practice etc.*

Probe [VALUE OF HUB]: What is your opinion of the value of a single location (human or electronic) to support physicians' PI/QI efforts (i.e. a hub providing access to CPD concierge, mentors/coaches, tools, repository of PI/QI projects etc.)?

**6. Are there any other issues related to PI/QI in rural BC and in general that you think we haven't addressed so far that you would like to comment on?**

**FOCUS GROUP PROTOCOL**

*FG8: Health authorities and program regulators*

**QUESTIONS**

**1. As a program regulator, what are your views on PI/QI?**

Probe [WHAT WORKS]: What is working well (a) system-wide and (b) with respect to specific PI/QI initiatives or activities your organization may be involved in?

*Probe: In your opinion, which existing PI/QI supports or resources are working and which ones are not?*

*How can the resources or supports be improved?*

*Examples: in-practice coaching, health authority funding support etc.*

Probe [TEAM-BASED PI/QI]: What are your thoughts on team-based PI/QI?

Probe [PATIENT MEDICAL HOME AND PI/QI]: What are your views on PI/QI within the context of the Patient Medical Home/Primary Care Home?

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Probe [FUTURE DIRECTION]: What do you envision for PI/QI at the provincial level?

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**6. Are there any other issues related to PI/QI in rural BC and in general that you think we haven't addressed so far that you would like to comment on?**