



Piloting a regional collaborative in cancer surgery using a “community of practice” model

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ABSTRACT

Background

Patients requiring assessment for cancer surgery encounter a complex series of steps in their cancer journey. Further complicating the process is the fact that care is often delivered in a fragmented, silo-based system. Isolated strategies to improve cancer outcomes within those systems have had inconsistent results.

Methods

A regional quality improvement collaborative was developed based on a community of practice (COP) platform, a hub-and-spoke infrastructure, and a regional steering committee linking COP improvement projects with affiliated hospitals and their strategic priorities. The COP provided an avenue for multidisciplinary teams to collect and compare their performance data and to institute regional standards through literature review, discussion, and consensus. Regional interdisciplinary teams developed a set of quality indicators linked to mutually agreed-upon care standards. A limited regional database supported feedback about performance against both provincial and regional standards.

Results

The COP approach helped to develop a multihospital collaboration that facilitated care quality improvements on a regional scale, with clinical outcomes of the improvements able to be measured. The 9 participating hospitals delivered cancer surgery in the specific disease sites according to practitioner-developed and provincially- or regionally-generated care standards and clinical pathways. Compliance with provincial evidence-based clinical guidelines improved (20% increase in 2010–2011 compared with 2006–2007). Other significant improvements included standardization and implementation of regional perioperative

pathways in breast, colorectal, and prostate cancer disease sites; rectal cancer surgery centralization; increased use of sentinel lymph node biopsies in breast cancer surgery; and decreased positive surgical margin rates in prostate cancer.

Conclusions

Improved quality is likely a result of diverse confounding factors. The deliberately cultivated multihospital multidisciplinary COPs have contributed to positive structural and functional change in cancer surgery in the region. This regional COP model has the potential to play an important role in the development of successful collaborations in care quality improvement.

KEY WORDS

Community of practice, regional collaboration, quality improvement, cancer care

1. INTRODUCTION

Cancer surgery care is often delivered as part of a fragmented, silo-based system, and isolated improvement strategies have had inconsistent results¹. Successful implementation of improvements relies heavily on a multi-pronged approach with buy-in and support from a large number of stakeholders. This paper describes how a regional community-of-practice (COP) model was used to foster a multihospital, multi-professional collaboration to improve the quality of cancer surgery; it also reflects on implementation challenges in a real-world setting. A companion article based on the experiences of the authors describes how the conceptual model was developed and refined².

2. BACKGROUND

The challenges in meeting the demand for high-quality cancer care are numerous and complex.

Surgery-specific challenges with building multidisciplinary teams, providing infrastructure support for team-based care, collecting actionable performance data, and overcoming cultural barriers, inertia, and disengagement are all well documented^{3–6}. In Canada, cancer surgery is dispersed across large geographic areas with low population density, is offered in both academic and community hospitals, and is provided by general, specialty, and oncology surgeons. A large proportion of cancer surgery is also conducted in a general surgical environment, ranging from a single subspecialty in large centres to broad-based practices in smaller communities. As a result, even within single hospitals, surgeons often take strikingly different approaches^{7–10}. At a system level, known challenges include increasing wait times for cancer assessment and surgery, inconsistent surgical care processes, cancer care services that are often disjointed and inefficient, a lack of evidence about quality outcomes, and variations in patient outcomes³.

In the Champlain region of Ontario, more than 5000 new cancers are diagnosed annually within a population of 1.2 million dispersed across 18,000 km². The region has 65 general, specialty, and oncology surgeons in 9 regional hospitals performing more than 1700 primary surgeries for 3 disease sites (breast, colorectal, and prostate cancers) annually. The region-specific challenges (before implementation of the model) mirrored the systemic issues already listed and further included little or no formal organizational capacity for cancer surgery in the 8 community hospitals, absence of a coordinated focus on standardized patient education and experience, and lack of a systematic approach to the challenge of multidisciplinary and multi-institutional collaboration.

To address those challenges, an integrated quality improvement platform was designed that included all regional hospitals working together at every stage in the continuum of care. The goals were to ensure an optimal outcome for every cancer surgery patient by providing the best-quality care in the most appropriate setting. The CoP approach within the context of a regional operational structure was identified as a promising framework to promote the development of the multi-professional, multi-organizational collaboration necessary to tackle the challenges². This paper describes the operationalization of that approach.

3. METHODS

In this real-world experience, we had limited resources to support a baseline state assessment and rigorous *a priori* collection and analysis that would better inform a more robust data review. However, we were able to capture some limited datasets to reflect the impact of the model.

3.1 Implementation Design

The CoP model was adapted for cancer surgery based on findings from a systematic literature review of other regional surgical collaborations and on the initial experiences of the authors^{11–13}. The key elements included interdisciplinary input from management and clinical perspectives, establishment of trust between individuals and between institutions, availability of accurate and complete performance data pertinent to individual practice, clinical leadership, institutional commitment, and infrastructure and methodology support to enable the collaborative work¹².

Those success factors were incorporated into the implementation design of a regional collaborative (Figure 1) that included three major components:

- a deliberate, institutionally supported CoP platform²,
- an oversight coordinating committee³, and
- a hub-and-spoke supporting infrastructure, with a central physical and virtual cancer assessment clinic.

3.1.1 Deliberate CoP Platform

The multidisciplinary, multi-organizational regional CoP in cancer surgery was established in 2006. Since then, it has developed into 3 interdisciplinary regional CoPs in breast, colorectal, and prostate cancer, involving 230 care providers—surgical, medical, and radiation oncologists; nurses; social workers; administrators; family doctors, radiologists, gastroenterologists, and public health leaders—from 9 hospitals. Membership is voluntary and includes representation from tertiary, community, and primary care organizations. The CoP events are held mostly outside of business hours, and participants are not reimbursed for participation, travel, or other expenses.

The CoP concepts are described in detail in the companion article². In short, the CoP platform was designed to systematically leverage the skills and passions of individual administrative and clinical practitioners across institutions toward common goals. The goals were directed either to the effectiveness or efficiencies of care as perceived by the various groups and were then explicitly linked to performance measures of effect on care outcomes. The CoP activities provided formal continuing medical education credits and served to link the strategic direction of organizations and the professional development goals of practitioners.

3.1.2 Administrative Coordination

The required organizational commitment and leadership was secured through partnership agreements between regional hospitals and regular meetings of the Regional Cancer Surgery Committee. The committee membership included vice-presidents

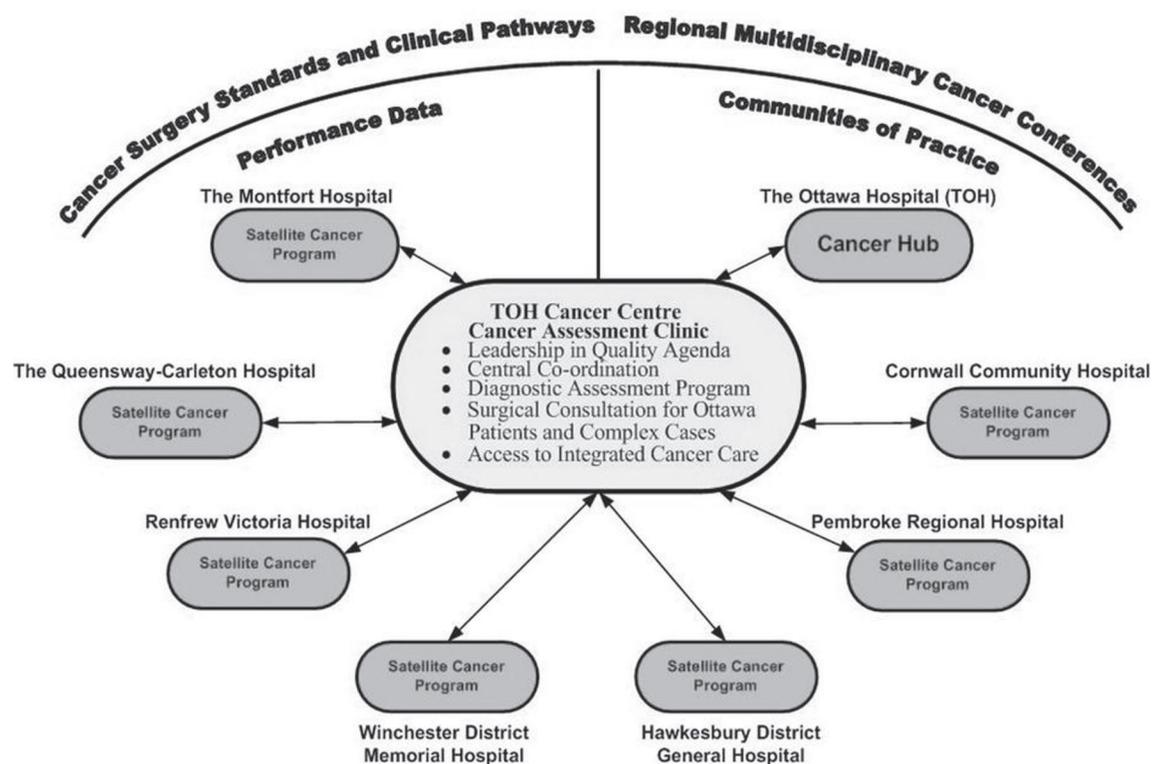


FIGURE 1 The Champlain regional model for improving access to quality cancer surgery. Key elements include regional networks (communities of practice), support infrastructure (Cancer Assessment Clinic), regional satellite cancer programs, availability of performance data, multidisciplinary cancer conferences, and standards for cancer surgery. The model formally links the key elements rather than implementing each one as a separate quality improvement initiative.

and heads of surgery from participating hospitals—senior management and clinical leaders that are closely linked and aligned on improvement targets. The committee meetings facilitated and enabled initiatives from the practitioner-driven disease-site-based cops. In addition, the committee served as a venue for cross-hospital collaboration on reorganization of care, resource allocation, and sharing of performance data.

3.1.3 Hub-and-Spoke Infrastructure

With the organizational commitment and leadership components in place, the infrastructure for the regional collaborative model of care was built using an umbrella model with a hub-and-spoke design (Figure 1). The tertiary centre, The Ottawa Hospital, served as “the regional hub” and acted as a gateway for access to cancer services, anchoring the virtual regional model. It provided leadership in the quality agenda, central coordination, and triage for cancer care; it housed diagnostic assessment programs; it provided surgical consultation for patients within the catchment area; and importantly, it provided surgical consultation for complex cases from across the region. Based on a common set of mutually determined standards and linked performance data,

each regional hospital (the “spokes”) developed unique satellite cancer surgery programs based on their capacity and the needs of their community. The goal was delivery of an optimal outcome for every patient by providing standardized care within the most appropriate setting.

The hub-and-spoke model further supported the integration of care initiatives, which included a central physical and virtual cancer assessment clinic, regional multidisciplinary cancer conferences, standardized clinical pathways, and access to provincial and regional practitioner-driven datasets.

3.2 Cancer Assessment Clinic

Aligned with provincial standards for cancer diagnostic assessment programs^{14,15}, centralized diagnostic assessment provided a point of access for comprehensive cancer services and afforded the opportunity to implement quality standards of care while providing an improved experience for patients and families. Referring physicians had increased access to specialist care with one point of contact, ensuring that complex patients received timely access to consultation. This coordinated and centralized approach allowed such cases to be

directed to tertiary surgical care; meanwhile, more general cases could be distributed throughout the general surgical setting.

3.3 Regional Multidisciplinary Case Conferences

The care for patients with cancer requires involvement and coordination of interrelated disciplines. Implementing provincial guidelines¹⁶, the regional model promoted a patient-focused multidisciplinary team setting as the standard for managing patient care across the region. Members of the cops participate in regularly scheduled case conferences, either in person or by videoconference. The intent is to optimize patient management and to promote and create awareness of best practices.

3.4 Surgical Standards and Clinical Pathways Based on Best Practices

One of the primary strengths of regional collaborations is the opportunity to use data from participating hospitals to create regional quality standards¹⁷. The cops provided a venue for community and tertiary care providers to work together in determining agreed-on regional standards and clinical pathways through literature review, discussion, and consensus. In the cop process, participants used a collaborative methodology to define regional standards for the care of cancer patients to be implemented in each practice. The process included evidentiary review and consensus-based processes leading to development and implementation of regional clinical pathways. A set of regionally and provincially driven quality indicators was developed to assess whether the quality and value of care were improving.

3.5 Performance Data Collection and Feedback

Since 2007, the communities have been engaged in data collection and performance feedback against provincial and regional standards. Region-specific provincial comparative data for activity in 29 evidence-based measures were provided through Cancer Care Ontario. Provincial data reports were updated annually; regional data were collected and shared every 6 months.

Hospital-specific regional comparative data were related to a set of regional quality indicators linked to care standards developed through literature review, discussion, and consensus. Specific methods for data collection were determined by discussions between administrators and clinicians. The data were analyzed and rolled into the twice-annual cop reports, which were shared with clinicians and administrators internally within the tertiary centre. In addition, the reports were shared regionally through the Regional Cancer

Surgery Committee and the disease-specific cops to drive and measure the effects of the ongoing quality initiatives.

4. RESULTS

4.1 CoP Outcomes

This regional case demonstrates how a cop approach is useful in overcoming professional and institutional barriers to development of a multihospital collaboration meant to facilitate care quality improvements. The clinical outcomes following from the improvements can be measured and are provided in the examples that follow. The observed improvements in clinical outcomes might be associated with multiple confounding factors (secular trends, government initiatives) not related to the regional collaborative work. However, the collaborative work played an important role in enabling the uniform implementation of quality improvement interventions across the region.

The most important result of this cop implementation experience was setting the stage for a positive interaction between multidisciplinary practitioners and administrators to work together toward common goals. Within the first year, more than 100 people had joined the cops and participated in regional improvement projects. All 9 hospitals implemented innovations in delivery of care, including centralized rectal care; prostate pathology protocols; consensus-based, standardized perioperative pathways (breast, colon, prostate); sentinel lymph node biopsy for breast cancer; regional pathways and standards; standardized radiologic diagnostic testing; and access to standardized patient education materials. The cop model continues to scale into the region: over 5 years, participation rates by hospital and by discipline have increased by factors of 3 and 5 respectively (Table 1).

4.2 Quality Improvement Indicators

Closing the gap between knowledge and practice, the collaborative work through the cops supported an increase in compliance with provincial and regional evidence-based clinical practice guidelines (2005–2006 vs. 2011–2012). Table 2 demonstrates improvements in 4 provincially- or regionally-driven outcomes. Surgical lymph node retrieval rates in colon cancer increased by 20% over 6 years. The number of regional patients treated within provincial wait time targets for cancer surgery increased 19%. Every hospital delivered cancer surgery to regional care standards and following clinical pathways, with compliance in the 65%–94% range. Multidisciplinary collaboration and knowledge exchange led to a decrease in rates of positive surgical margins in prostate cancer.

TABLE I Community of practice (CoP) outcomes

<i>Outcome</i>	<i>Fiscal year 2005–2006</i>	<i>Fiscal year 2011–2012</i>
Regional collaboration	Limited to personal relationships	More than 230 multidisciplinary members
Regional meetings	Limited to individual specialties	Ongoing disease-specific multidisciplinary meetings held 4–5 times per year
Professional development	Limited to individual specialties	Three CME-accredited multidisciplinary forums
Regional innovations in care delivery	Limited to individual hospitals and individual practitioners	Innovations in delivery of care implemented in all 9 hospitals (centralized rectal care; prostate margins; sentinel lymph node biopsy; standardized diagnostic testing, access, and patient flow), regional clinical pathways in use in 8 of 9 hospitals
Regional comparative data review	No accessible data	Regionally-developed limited database
Forum for sharing of group data	None	Three disease-specific CoPs Quarterly meetings of regional vice presidents
Regional quality measures	None	Tracking 21 individual quality measures
Patient education	No standardized patient education	Regionally-developed patient information guides, standardized pre-op classes for patients

CME = continuing medical education.

TABLE II Compliance with evidence-based guidelines

<i>Guideline</i>	<i>Compliance rate</i>	
	<i>Fiscal year 2005–2006</i>	<i>Fiscal year 2011–2012</i>
Surgical wait times (from decision to treat to date of surgery)	Of cancer surgery patients, 59% met provincial wait-time targets	Of cancer surgery patients, 78% met provincial wait-time targets
Regional clinical pathway utilization	0%	76%
Colon cancer with retrieval of ≥ 12 lymph nodes	69%	89%
Rate of positive surgical margins in prostate cancer	31%	21%

Ongoing review of the regional quality indicator data produced improvements in regional cancer surgery care as seen in Figures 2 and 3, and Table II. Over the 5-year period, implementation of the regional model resulted in internal process re-design, system changes, more effective utilization of regional resources, and improved compliance with evidence-based clinical practice guidelines.

Quality diagnostic care for surgical patients with breast cancer was improved through multidisciplinary collaboration within the regional CoP. For example, the sentinel lymph node biopsy process was implemented across the region, using several strategies including physician mentorship, clinical team education, administrative support, and sharing of resources in nuclear medicine. This multidisciplinary collaboration enabled the provision of sentinel lymph node biopsies in 7 of 7 community hospitals, resulting in 77% of appropriate patients receiving sentinel lymph node biopsy.

Another priority area for the CoP quality improvement work was the development and implementation of standardized regional clinical pathways. Clinical pathways were developed for all 3 disease sites through evidence review, discussion, and consensus. The pathways were successfully initiated in a staged approach across the region (Figure 3). The pathway implementation contributed to significant reductions in variation for costly and clinically important areas of perioperative care in participating hospitals. For instance, the regional colorectal pathways (minimally invasive and open) were instrumental in introducing changes in practice including prophylaxis for venous thrombosis, early nutrition and mobilization, and decreased length of stay.

Figure 3 illustrates another example of optimal utilization of regional resources for cancer surgery care in the most appropriate settings. Over the 5-year period, regional referral rates to the oncology surgeons for complex cancer cases increased

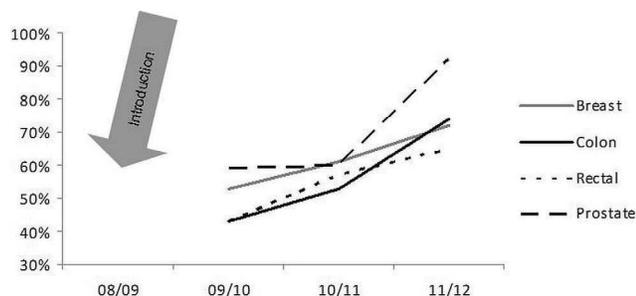


FIGURE 2 Clinical pathway utilization. The chart demonstrates the utilization of standardized clinical pathways in the regional hospitals. Regional disease-specific pathways for breast, colorectal, and prostate cancer surgeries were introduced in 2008–2009. Since that time, the standardized pathways have been introduced to all hospitals providing cancer surgical care in the Champlain region. An increase in utilization is seen in each year for all disease sites.

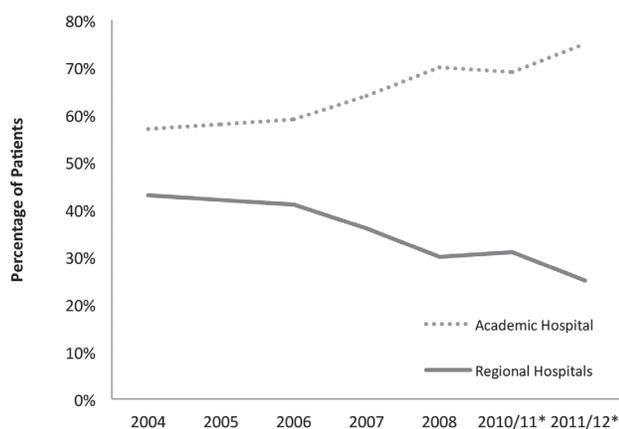


FIGURE 3 Centralization of rectal cancer surgery. The chart demonstrates a significant increase in regional community referral rates to the oncology surgeons for complex cancer cases over the 5-year period. * In 2010–2011 and 2011–2012, the available data sets were more robust.

considerably, and a voluntary trend toward centralization of rectal cancer surgery occurred, with 75% of patients now being treated at the academic tertiary centre.

4.3 Patient Satisfaction

Informed patients tend to be more satisfied with their care and to better comply with their treatment plans¹⁸. One of the outcomes of regional collaboration has been improved access to standardized education. Interactive tools such as online patient education materials and cancer assessment clinic perioperative education sessions provide important opportunities for patient engagement in shared decision-making. Preliminary results indicate that the single point of access for comprehensive cancer services has had a positive impact on the patient experience.

Since 2009, the cancer assessment clinic has participated in the NRC Picker Canada Patient Survey, which samples more than 300 disease-specific outpatients each year. The questionnaire, mailed to a random sample of those who received care in the cancer assessment clinic, covers wait times, staff responsiveness, involvement in care planning, patient information, coordination of care, attitudes of doctors and nurses, hospital environment, and patient dignity. Compiled and reported by quarter, response rates average 49%. According to the results, 84% of respondents rated their participation in outpatient care decisions as very high, and 100% of patients said that their family and friends were also involved in the care and treatment plan.

4.4 Provider Satisfaction

Data from the after-event feedback forms and the annual COP survey demonstrate that participants were engaged with and enthusiastic about the program. Members of the COP gave their most positive evaluations of COP activities to a few key functions of the program: facilitating regional linkages and a culture of collaboration, innovation support, uptake of clinical guidelines, and access to subject matter experts.

To assess the impact of the COPs on changes in practice, both survey instruments contained the question: “Has your participation in COP activities led you to change your practice or to plan to change your practice?” According to the results, participants were more likely to align their practice with mutually-determined regional standards as they became more involved in the COP, with 57.2% of respondents reporting changes in practice as a result of participation in COP activities. Of positive responses, three quarters came from those who participated more than 3 times per year.

5. DISCUSSION

There are many difficulties inherent in implementing quality improvements across geographic, organizational, and professional boundaries. A lack of clear structure in which to work is an important limitation¹⁹. The development of our regional collaboration in cancer surgery is a “proof of concept” that shows the feasibility and usefulness of the COP approach in supporting large-scale improvement interventions.

What appears to be advantageous within the model is the moderate size of the collaborative in which the comparative evaluation is done and through which transfer of best practices flows easily, unlike the flow in other collaborative models implemented on a state-wide, provincial, or national scale¹⁹. Although each of those models has been used successfully, most are linear, centralized, labour-intensive, and unable to bridge professional and organizational silos²⁰. The regional COPs systematically leverage the power of

existing social networks, in which administrative and clinical practitioners know each other and encounter similar challenges.

Another advantage of the approach over alternative models is that the quality improvement activities were accredited as continuing medical education, providing significant incentive for engagement. Our experience suggests that cop concepts were helpful in turning traditional professional development forums such as journal clubs into quality, problem-focused sessions linked to follow-up team and individual learning projects.

It is our experience that systematic implementation of a cop as a social platform to enable learning, sharing, and joint problem-solving across disciplines permits positive structural and functional changes in surgical care in the region. The most significant changes were the voluntary development of cancer surgery committees in the participatory hospitals, thus coordinating the activities of the wider regional group; and implementation of jointly developed regional care pathways across disease sites and hospitals. Those changes were foundational for the other quality improvement interventions that followed.

There are a number of challenges in the methodology of conducting evaluations of multicentre cops involving clinical and administrative staff across different disease sites. Collaboration at the regional scale takes time and comes from a long-term process of gradual improvement (organizationally and culturally) at all participating hospitals. It has taken several years of regular meetings and the social process of human interaction to recognize common goals and overcome organizational and professional silos. It has required a new set of management skills, incentives, and resources to support alignment of the diverse ideas and distinct decision-making processes of clinicians and administrators alike. A more robust and multidimensional methodologic approach is therefore needed to not only quantify the impact of the model but to also assess cause and effect. A comprehensive approach of that kind was beyond the scope of the present report, but represents a challenge for future work in this area.

6. CONCLUSIONS

The Champlain regional quality improvement collaborative in cancer surgery represents a unique model of health care delivery. It provides the basis for linking individual continuing professional development, skills, and interests to the implementation of quality improvement initiatives on a regional scale. The model, which includes a cop platform, a hub-and-spoke structure, and an administrative coordinating committee, has facilitated collaborative work in 9 independent hospitals across both administrative and clinical interdisciplinary networks. That collaboration has allowed for the alignment of various tiers of a regional health care system to

focus on reducing variations in care, improving the quality of clinical care provided in the region, and simultaneously optimizing the patient experience.

This regional case is presented to promote discussion on appropriate approaches to developing multi-professional, multi-organizational collaborations to specifically improve the quality of cancer surgery. The positive effect on care as reported here is hypothesis-generating in regard to the true value of such a model. This topic warrants a prospective study with a more rigorous methodology. We are currently looking at comparative care trends across Ontario for the same time period to further quantify the impact of our model. That scrutiny will be the subject of a later report.

Finally, this systematic approach to creating a framework for collaboration has been successful in facilitating professional knowledge transfer and alignment of surgical cancer care at the regional level. The regional cop model has the potential to play an important role in the development of large-scale health care quality improvement collaborations across professional and organizational boundaries.

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8. CONFLICT OF INTEREST DISCLOSURES

The authors declare that no financial conflict of interest exists.

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