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Improving the Quality of Radiation Treatment for Patients in Ontario: Increasing Peer Review Activities on a Jurisdictional Level Using a Change Management Approach

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QUESTION ASKED: What is the impact of the Cancer Care Ontario (CCO) strategy (designed with guidance from a change management framework) to accelerate the use of peer-review processes in radiation oncology (ie, review of a radiation oncologist's proposed treatment plan by a second radiation oncologist with or without additional multidisciplinary input) across all of its 14 cancer treatment centers?

SUMMARY ANSWER: By following a number of key change management principles for organizational transformation, the proportion of radical-intent radiation therapy courses peer reviewed province-wide increased from 43.5% (April 2013) to 68.0% (March 2015), with some centers reaching over 95%.

METHODS: The initiative design was guided by the Kotter eight-step process for organizational transformation, including the creation of a multidisciplinary leadership team, site visits to individual centers, the development of education and implementation processes (done in collaboration with each center), and the creation of new performance metrics for central reporting. Monitoring of these metrics enabled the leadership team to track the percentage of radiation therapy courses peer reviewed and the timing of peer review (before 25% treatment visits complete, after 25% treatment visits complete). Performance targets for the quality measures were arrived at by consensus that included engagement of all center radiation treatment program leaders.

BIAS, CONFOUNDING FACTOR(S), DRAWBACKS: Peer review has been shown to increase quality of care. However, it requires that resources be invested, including the time and effort of radiation oncologists, and the programmatic work required to organize, execute, and document peer-review activities. There is currently no way of confirming the quality of peer-review activities.

REAL-LIFE IMPLICATIONS: A change management framework can be useful for planning and achieving substantial increases in peer-review activities on a jurisdictional basis. Ongoing work will capitalize on facilitators of peer review and on addressing barriers to its application that were identified as part of the initiative. Guidance for peer-review

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activities specific to common clinical cases is required and is under development. The principles of peer review could be extended to other oncological disciplines with the goal of improving individual patient care and overall program quality. **JOP**

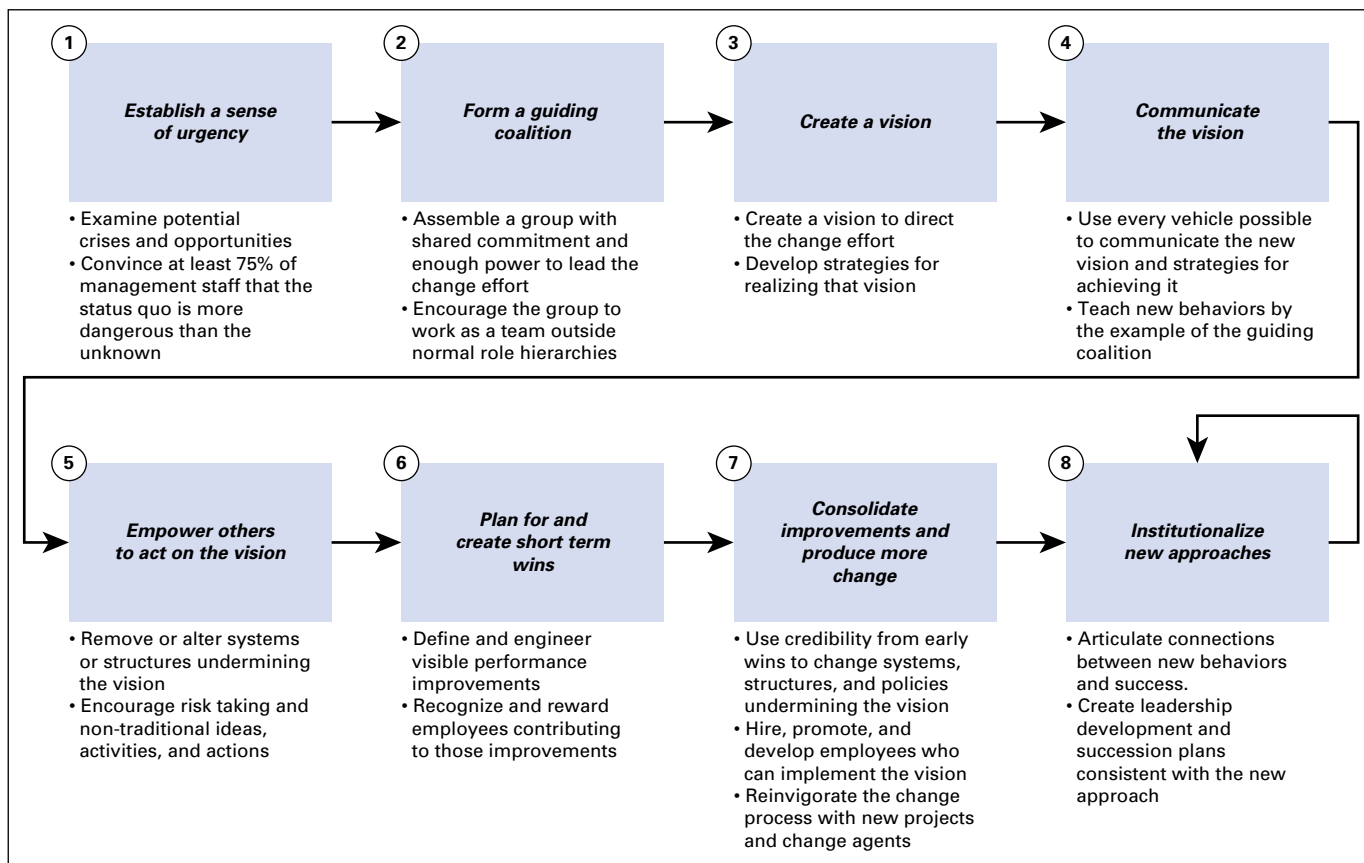


FIG 1. Percentage of radical-intent radiation treatment plans peer reviewed in Ontario cancer centers, April 2010 to March 2015

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Quality Improvement in Patient Radiation Treatment in Ontario: Use of a Change Management Approach to Increase Peer Review Activities

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Abstract

Purpose

Peer review of radiation treatment (RT) plans is a key component of quality assurance programs in radiation medicine. A 2011 current state assessment identified considerable variation in the percentage of RT plans peer reviewed across Ontario's 14 cancer centers. In response, Cancer Care Ontario launched an initiative to increase peer review of plans for patients receiving radical intent RT.

Methods

The initiative was designed consistent with the Kotter eight-step process for organizational transformation. A multidisciplinary team conducted site visits to promote and guide peer review and to develop education and implementation processes in collaboration with the centers. A centralized reporting infrastructure enabled the monitoring of the percentage of RT courses peer reviewed and the timing of peer review (before completion of 25% of treatment visits, after completion of > 25% treatment visits).

Results

The initiative is ongoing, but early results indicate that the proportion of radical intent RT courses peer reviewed province wide increased from 43.5% (April 2013) to 68.0% (March 2015). This proportion is now a quality metric in Ontario and is publicly reported through the Cancer System Quality Index. The performance target for this metric was initially set at 50% (cases treated with radical intent) and revised to 60% in 2014. Provincial performance exceeded targets in both years (58.2% and 68.2%, respectively). Considerable variation was observed, however, in rates and timing of peer review among Cancer Care Ontario centers.

Conclusion

This initiative demonstrates that a change management framework can be useful for planning and achieving substantial increases in jurisdictional peer review activities.

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INTRODUCTION

Radiation treatment (RT) planning is the process by which a team of radiation oncologists, radiation therapists, and medical

physicists collaborates to determine the appropriate external beam RT or brachytherapy treatment approach for a patient with cancer. It involves several clinical decisions

(eg, what regions of the patient are to be treated and with what intent) as well as highly technical decisions that require specialized expertise and precision (eg, radiation dose calculations, contouring volumes of interest, and organs at risk). Given its complexity, RT planning is a well-documented source of inconsistency and potential error in radiation medicine.^{1,2} High-profile dose-delivery incidents featured in major publications have brought radiation medicine programs under increased scrutiny, and the public and medical community have called for more measures to enhance the safety and effectiveness of RT.³ Such measures include the improvement of existing quality assurance (QA) programs to verify appropriate medical prescription, to assure that the technical implementation meets the medical intent, and to identify inconsistencies that may compromise patient care at every phase of care planning and delivery.⁴ QA is particularly important to radiation medicine programs and must be carefully aligned with clinical practice to reduce the likelihood of treatment-related errors, especially in an era of high-dose precision RT.^{5,6}

A white paper from the American Society for Radiation Oncology defined peer review in radiation oncology as an audit and feedback that implements QA processes at the level of the individual patient and that focuses on auditing the medical decisions of professionals involved with RT planning.⁷ In Ontario, Canada, the focus of peer review has been on QA of treatment decisions by radiation oncologists. As such, Cancer Care Ontario (CCO) defines peer review in radiation oncology as the evaluation of the elements of an RT plan by a second nonprescribing radiation oncologist, either one on one or, ideally, in a multidisciplinary group setting.⁸ Peer review is a key component of QA in radiation medicine because it increases the likelihood of identifying errors that may compromise treatment outcomes, enhances safety and quality through reduction of practice variations, and promotes learning and skills development among radiation medicine professionals.^{5,7-13}

In Ontario, RT services for the province's population of 13.6 million are provided through 14 regional cancer centers. CCO is the government agency responsible for ensuring accessible, high-quality cancer services for Ontarians. The CCO Radiation Treatment Program (RTP) carries out this mandate for RT across the regional cancer centers. When CCO identified peer review as a program priority in 2011, the RTP conducted a current state analysis to better understand patterns of RT peer review practice across Ontario. This analysis indicated high endorsement of peer review across Ontario centers, although considerable variation was observed in extent and quality¹³ and in described barriers to achieving

consistent practices.¹³ In response, CCO launched a collaborative initiative in 2012 to increase the proportion of RT plans that undergo peer review. The present report describes the design of this initiative on the basis of an existing change management framework and the impact of this initiative on improving the quality and uptake of RT peer review across an entire jurisdiction of cancer centers.¹⁴

METHODS

Design of the Initiative Framework Components

Ontario's 14 regional cancer centers range in size from two to 18 treatment units (103 units in total) that deliver from 870 to more than 10,500 RT courses annually at both academic and community hospitals (approximately 55,000 treatment courses across the province). The centers serve diverse patient populations over geographies of various sizes and population densities.¹⁴

Several change management frameworks (tools and structures for transitioning individuals, teams, and organizations to a desired future state) were considered in the planning phase of the initiative.¹⁵ In particular, CCO was influenced by the Kotter eight-step process for organizational transformation (Fig 1), which emphasizes the importance of building buy-in from change stakeholders and a view of change as a phased, long-term process.¹⁶ In this article, we describe how the CCO peer review initiative maps on to the components of the Kotter process. Figure 2 illustrates the timeline for the initiative.

Establish a sense of urgency

CCO established a clear need to increase peer review activities by several means. At meetings of Ontario's radiation medicine community, CCO emphasized the heightened level of scrutiny on RT safety prompted by recent negative high-profile media coverage³ and highlighted the contrast evident in programs that strongly endorse peer review in principle but differ in their peer review activities.¹³ These efforts were aided by the timely publication of a landmark article by Peters et al¹⁷ on the survival advantage for patients whose treatment plans incorporated changes proposed by peer review QA on a randomized clinical trial.

Form a guiding coalition

A multidisciplinary project team composed of provincial clinical quality leaders in radiation oncology, medical physics,

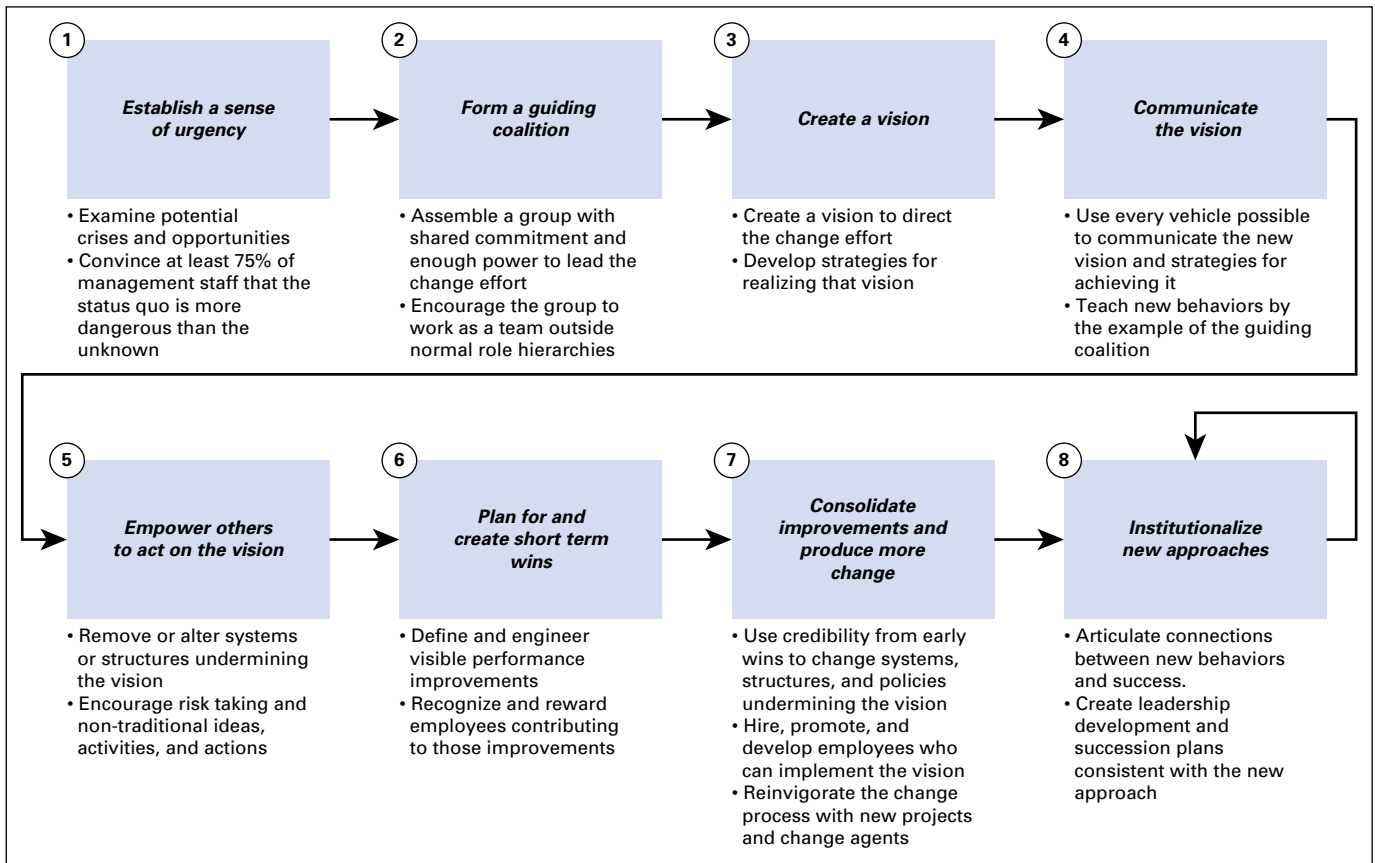


FIG 1. The Kotter eight-step process for organizational transformation.

and radiation therapy as well as CCO RTP staff was established to lead the initiative with the goal of encouraging stakeholders at the cancer centers to address discipline-specific barriers and to promote peer review as a priority and responsibility for all radiation medicine professionals.

Create a vision

The project team developed a two-fold vision for the initiative: To ensure that all patients in Ontario have the benefit of peer review of their RT plans and to provide leadership to other jurisdictions (nationally and internationally) that wish to benefit by learning from the Ontario experience. The aims were designed to be clear and well justified.

Communicate the vision

The project team promoted the peer review concept and initiative vision to gain buy-in from key stakeholders at the cancer centers. This was achieved through three tactics. First, peer review was emphasized as a major priority at key CCO radiation medicine community meetings, such as the

Provincial Radiation Treatment Program Committee Meeting, a semiannual gathering of cancer system administrators and the heads of radiation oncology, radiation therapy, and medical physics for Ontario cancer centers. Second, site visits to each cancer center secured the support of senior administrators and medical leaders. Finally, the project team promoted the initiative among frontline RT staff who would be active participants in implementing the initiative.

Empower others to act on the vision

The project team undertook the task of equipping the cancer centers with tangible approaches, tools, and technologies to increase peer review activities. As part of the planned site visits, the project team provided guidance on the incorporation of peer review rounds into local workflows, and education, training, and methods were collaboratively developed over a 1-year ramp-up period (2012-2013). Local staff members, typically radiation therapists, were designated as peer review QA coordinators. Mechanisms for reporting peer review activities were added to the existing CCO centralized reporting

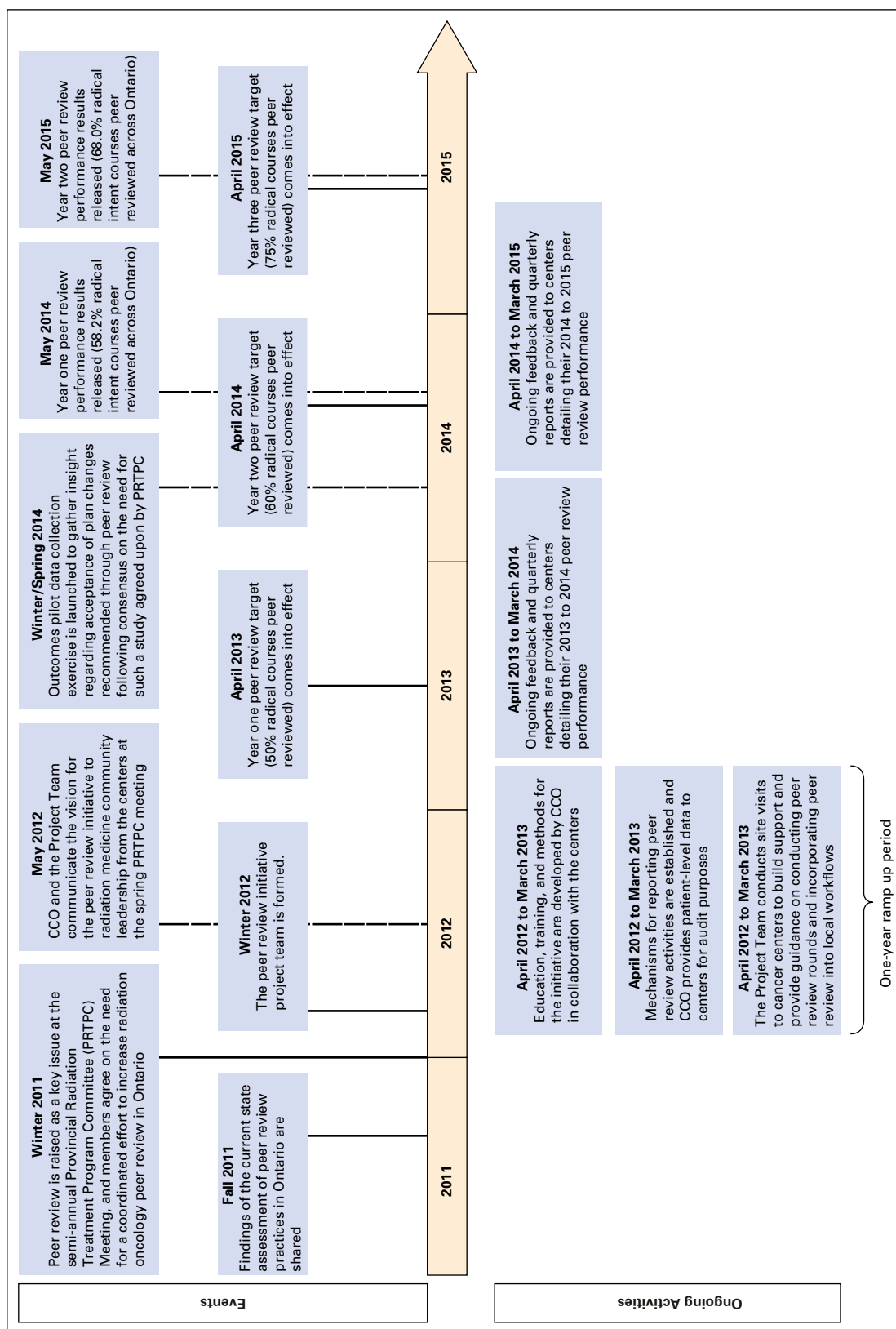


FIG 2. Timeline of events and activities related to the radiation oncology peer review project initiative (2011 to 2015). CCO, Cancer Care Ontario.

infrastructure. Patient-level data were available to the cancer centers for audit purposes and to ensure confidence in CCO activity reporting. At regional and provincial program meetings, centers could review and seek advice on barriers to peer review and concerns about data reporting.

Plan for and create short-term wins

Monitored performance metrics included the percentage of RT courses peer reviewed (percentage of completed courses peer reviewed over total completed courses) and the timing of peer review (before treatment, < 25% treatment visits completed, > 25% treatment visits completed). The initial focus was on radical intent RT plans (ie, plans that deliver radiotherapy as definitive or [neo]adjuvant treatment with curative intent). Expansion of peer review to include palliative intent RT plans was planned for later phases of the initiative. Analysis and reporting was conducted using iPort (Cancer Care Ontario, Canada), a business intelligence application based on MicroStrategy (Tysons Corner, VA).

For short-term project objectives, CCO established 12-month performance targets for the percentage of radical intent treatment courses peer reviewed. Targets were determined by consensus among provincial radiation oncology leadership based on considerations of feasibility and initiative expectations. CCO provided cancer centers with quarterly peer review performance updates and guidance on improving their peer review performance.¹⁸ Targets were not established for the timing of peer review in the early phases of the initiative because the objective was to support centers in increasing peer review activities.

RESULTS

Impact of the Initiative

Overall, the percentage of radical intent RT courses peer reviewed in Ontario cancer centers increased substantially with the implementation of the initiative. The promotion of peer review at major Ontario radiation medicine community meetings and the site visits to the cancer centers occurred and were important to the initiative's success. The meetings enabled the project team to build rapport with leadership and frontline RT staff, and input gained through these interactions was crucial to informing several framework components (Kotter process steps 3 through 5). Furthermore, the site visits provided an opportunity to train peer review coordinators to organize and support peer review rounds, which allowed CCO

to promote consistent RT peer review methods and encourage reduced variation in peer review practices across centers. Likewise, the CCO centralized reporting infrastructure was paramount to the success of the initiative because it simplified data collection, ensured objectivity, and made patient-level data available to centers for audit purposes.

Percentage of Plans Peer Reviewed

In the first year of the initiative (2013 to 2014), the target for the percentage of radical intent RT courses peer reviewed was 50%. This target represented a major increase because only 11.3% of RT courses underwent peer review at the time of the current state analysis. The actual percentage of radical RT courses peer reviewed across the centers during 2013 to 2014 exceeded the target (58.2%; Fig 3). In the second year of the initiative (2014 to 2015), the target was increased to 60%, and the actual percentage of radical intent RT courses peer reviewed across centers reached 68.0%. Provincial peer review rates increased from April 2010 to March 2013 before the launch of the initiative (Fig 3) due to early adopting clinics that responded to the identification of peer review as a key priority at radiation medicine community meetings coordinated by CCO before performance monitoring.

Variation in Peer Review Performance Across Centers

There was considerable variation in the percentage of radical intent RT courses peer reviewed across Ontario cancer centers (Fig 4). Although the provincial average for the percentage of radical courses peer reviewed in year 1 of the initiative was 58.2%, rates for specific cancer centers ranged from 34.1% to 99.5%. Some reduction in this variation was observed in the second year of the initiative, with rates for specific centers ranging from 41.8% to 99.4%. As illustrated in Figure 4, there was no clear relationship between these rates and center caseload (shown with circles).

Timing of Peer Review

Considerable variation was also observed in the timing of the peer review. As recommended by the American Society for Radiation Oncology and the Canadian Partnership for Quality Radiotherapy, plans to be peer reviewed ideally should occur before treatment start or before the completion of 25% of treatment visits because this confers maximum benefit to patients and minimizes the need for replanning.^{7,19} In years one (2013 to 2014) and two (2014 to 2015) of the initiative, respectively, however, 15.2% and 15.6% of plans peer reviewed

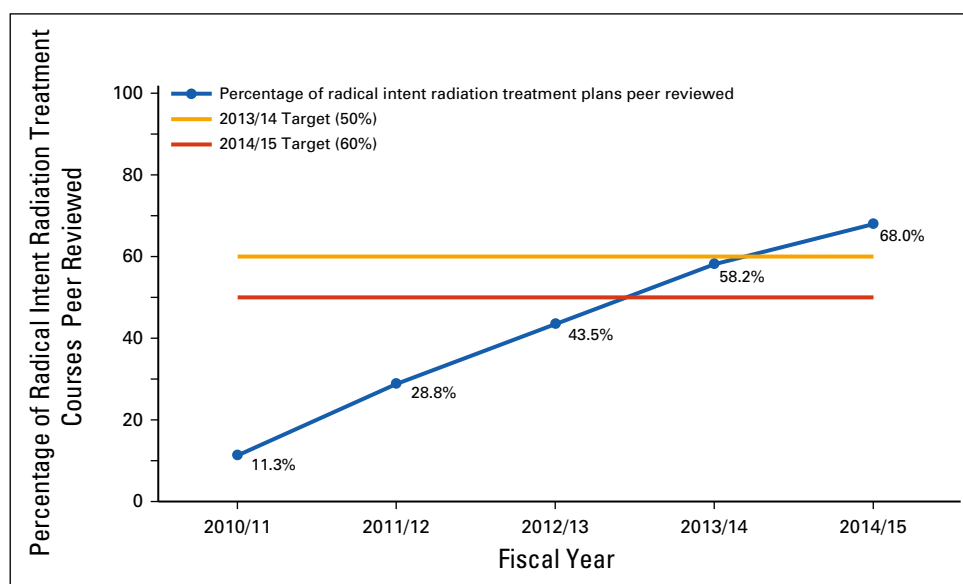


FIG 3. Percentage of radical intent radiation treatment plans peer reviewed in Ontario cancer centers (April 2010 to March 2015).

in Ontario cancer centers were peer reviewed after 25% of treatment visits were completed.

DISCUSSION

This initiative illustrates that change management can be a helpful framework for increasing peer review activities on a jurisdictional level. Despite variation in timing and performance among centers, peer review activities have increased at all centers and are now an important quality metric in Ontario. Regional performance is publicly reported and reviewed through quarterly balanced scorecards with centers.²⁰ The initiative remains a work in progress. Targets for peer review are revisited annually, and CCO is committed to supporting centers in improving peer review performance and, eventually, institutionalizing peer review (step 8 of the Kotter process; Fig 1).

Change happens slowly, particularly in health care.²¹ A survey of 167 frontline leaders across four large not-for-profit secondary care hospitals in the US Midwest identified a set of key factors that often cause health care improvement and change efforts to fail²²; these include poor implementation planning; overly aggressive timelines; failure to create buy-in and ownership; a weak case for change; and failure to provide ongoing measurement, feedback, and accountability. By taking a change management approach, CCO has avoided many of these common pitfalls. In addition, Ontario's publicly funded single-payer health care system facilitated

implementation on a provincial scale and created confidence in initiative results through public reporting.

The initiative was not without challenges. The term peer review was itself a challenge because of a lack of a clear definition specific to RT. CCO built on the general definition of peer review as the evaluation of creative work or performance by other individuals in the same field to enhance the quality of the work or performance,²³ by adding a specific criterion that a second radiation oncologist be involved. This definition allowed conceptualization of peer review as one-to-one radiation oncologist interactions as well as multi-disciplinary engagement and participation in the review of RT plans.⁸ Furthermore, because peer review is an evolving field, guidance on conducting peer review is limited,^{7,13,24} thus creating potential for variation in quality of those peer review processes.¹³

Some radiation oncologist attitudes toward peer review also presented a challenge because of the additional workload required and concerns about potential medicolegal implications of documentation, an observation consistent with other findings.^{24,25} In addition, some radiation oncologists have speculated that high-risk plans (RT plans where significant potential for adverse patient outcomes exist if tumor targets and/or normal structures are treated inappropriately) and low-risk plans demand different degrees of scrutiny in the peer review process and that a need exists for more calculated and targeted approaches to peer review.⁸ However, because

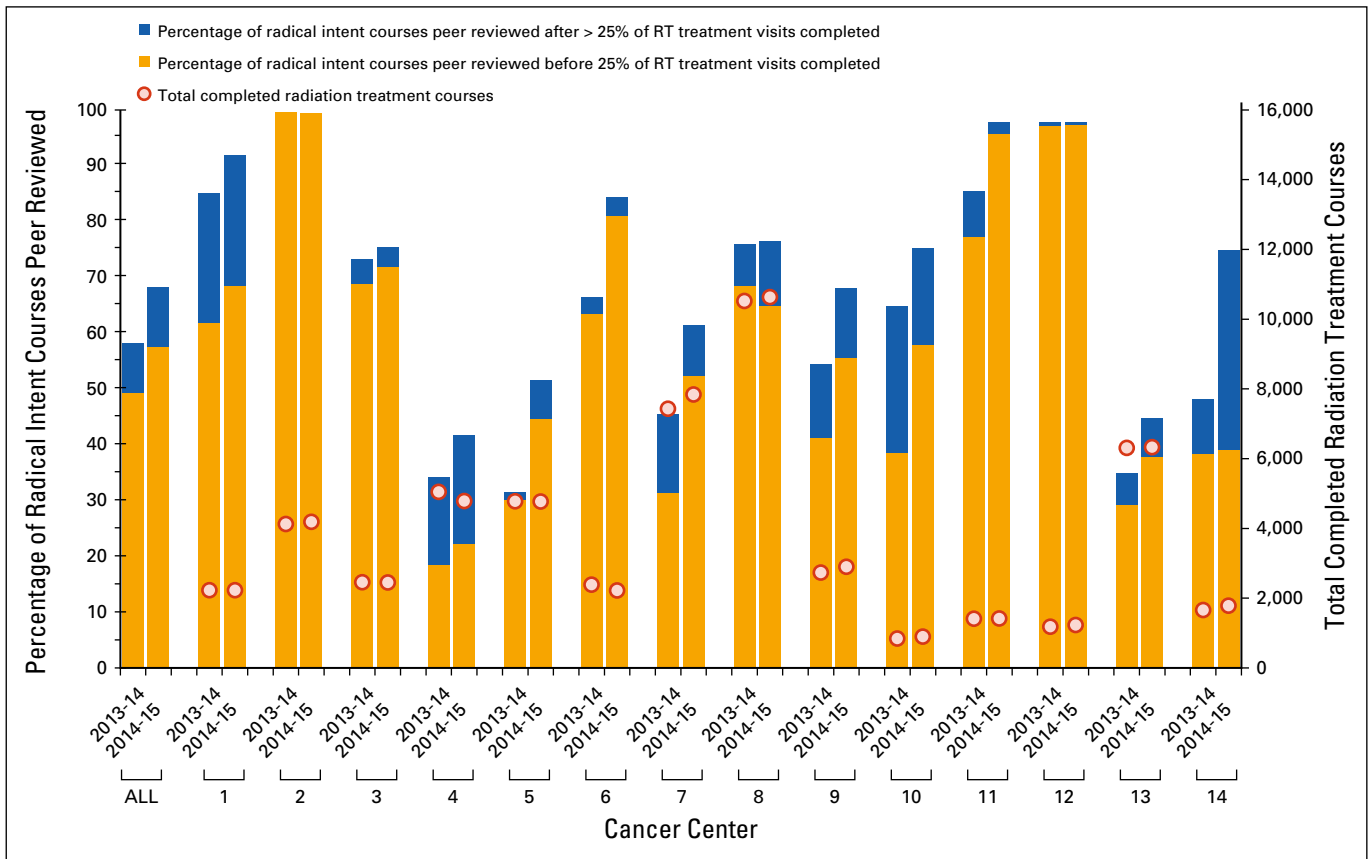


FIG 4. Variation in the rate and timing of peer review of radical intent radiation treatment plans across Ontario cancer centers (April 2013 to March 2015) and total completed radiation treatment courses across Ontario cancer centers (April 2013 to March 2015).

minimal research exists on the lack of need for peer review in low-risk plans, the ultimate target for peer review remains 100%. Ontario investigators have launched a study to better understand the outcomes of peer review in terms of physician acceptance of recommended plan changes and to inform the development of site-specific targets and strategies. By determining which disease sites and plans should be prioritized, these investigators hope to increase the efficiency and effectiveness of radiation oncology peer review.

As the initiative moves toward the phase of consolidating improvements and institutionalizing change (steps 7 and 8 of the Kotter process), CCO is focused on better understanding factors that contribute to variation in peer review performance to ensure that the benefits of peer review are conferred consistently and equitably across the province. Regional variation in peer review activities has been observed in other jurisdictions and attributed to such factors as practice type, practice size, and environment/culture around peer review acceptance²⁵; however, the findings of a recent national survey of

Canadian cancer centers indicated that neither center size nor designation as academic or community predicted peer review performance.²⁶ The authors also aimed to clarify why a substantial proportion of RT plans peer reviewed in Ontario are reviewed after 25% of treatment visits are completed because this practice is suboptimal.^{7,19} Informal presentations by center leaders suggested that newer centers have had the opportunity to build peer review into their workflow strategies and may have cultures more accepting of peer review compared with older, larger centers. Ontario investigators continue to undertake both quantitative and qualitative approaches to better understand the ongoing barriers and facilitators to peer review to ensure that concerns about the equity, quality, efficiency, and sustainability of peer review are addressed. In addition, the Canadian Partnership Against Cancer will extend this research across Canada with Ontario's leadership.²⁷

Because peer review activities are designed to improve quality of care, consideration of the impact of peer review on patient outcomes is important. Retrospective analyses have

provided some evidence of the importance of peer review in optimizing outcomes.¹⁷ In the context of this initiative, however, the impact of peer review on clinical outcomes cannot be determined quantitatively through center comparisons because of the universal incremental implementation of peer review across radiation oncology programs. Given the strong endorsement of peer review, random assignment of patients or clusters to use or not to use peer review would be inappropriate. Furthermore, a pre or post comparison of outcomes is not possible due to multiple confounding factors that cannot be reliably controlled for in outcome analyses. Ontario investigators, however, continue to systematically evaluate the extent to which peer review processes identify plans that require consideration of revisions before treatment delivery (as has been shown in other settings^{1,2}). These data will serve as indirect evidence of impact on quality of care.

The value of peer review is not exclusive to radiation oncology. Patients who receive surgical or medical interventions for cancer may benefit from patient-level peer review as well, and high-profile incidents in Ontario support the case for increased QA in cancer imaging and pathology.^{28,29} In recognition of this, CCO has explicitly identified peer review as a priority in the Ontario Cancer Plan IV, the province's 4-year plan to reduce the burden of cancer and improve the health and quality of life of Ontarians.³⁰

This study demonstrates that change management can be a helpful framework in structuring an approach for significantly increasing peer review activities jurisdictionally. To date, CCO and the province of Ontario have seen success with this approach, and conceivably, this approach could be applied by other jurisdictions. Although further research is required, change management theory might inform other QA initiatives to achieve improved safety and quality of care for patients. Future efforts should be directed toward the development of evidence-based standards and best practices for conducting peer review, which continue to be called for by the radiation oncology community provincially, nationally, and internationally.^{13,24,25} Further research on the infrastructure, systems, and human resources required to support peer review could further inform how peer review can be incorporated and optimized in radiation medicine programs.²⁴ **JOP**

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST**Quality Improvement in Patient Radiation Treatment in Ontario: Use of a Change Management Approach to Increase Peer Review Activities**

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