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IMRT utilization in Ontario: qualitative deployment evaluation

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Abstract

Purpose – The purpose of this paper is to describe a jurisdiction-wide implementation and evaluation of intensity-modulated radiation therapy (IMRT) in Ontario, Canada, highlighting innovative strategies and lessons learned.

Design/methodology/approach – To obtain an accurate provincial representation, six cancer centres were chosen (based on their IMRT utilization, geography, population, academic affiliation and size) for an in-depth evaluation. At each cancer centre semi-structured, key informant interviews were conducted with senior administrators. An electronic survey, consisting of 40 questions, was also developed and distributed to all cancer centres in Ontario.

Findings – In total, 21 respondents participated in the interviews and a total of 266 electronic surveys were returned. Funding allocation, guidelines and utilization targets, expert coaching and educational activities were identified as effective implementation strategies. The implementation allowed for hands-on training, an exchange of knowledge and expertise and the sharing of responsibility. Future implementation initiatives could be improved by creating stronger avenues for clear, continuing and comprehensive communication at all stages to increase awareness, garner support and encourage participation and encouraging expert-based coaching. IMRT utilization for has increased without affecting wait times or safety (from fiscal year 2008/2009 to 2012/2013 absolute increased change: prostate 46, thyroid 36, head and neck 29, sarcoma 30, and CNS 32 per cent).

Originality/value – This multifaceted, jurisdiction-wide approach has been successful in implementing guideline recommended IMRT into standard practice. The expert based coaching initiative, in particular presents a novel training approach for those who are implementing complex techniques. This paper will be of interest to those exploring ways to fund, implement and sustain complex and evolving technologies.

Keywords Evaluation, Innovation, Complex technology, Implementation, IMRT, Utilization

Paper type Case study

Introduction

Rapid advances in healthcare technology, in combination with changing patient demographics, disease patterns and treatment options, pose significant resource and cost challenges to healthcare (Nguyen *et al.*, 2011). Radiation oncology is particularly dependent on complex treatment delivery techniques, which are constantly evolving (Burnet *et al.*, 2012). When implementing new treatment techniques, such as intensity-modulated radiation therapy (IMRT), it is crucial to measure and evaluate implementation to ensure that scarce resources are used efficiently. Further, it is useful to reflect on the implementation process efficacy to determine how it might be improved in future iterations. Evaluations help to analyse prediction accuracy regarding a project's impact and clarify what works and what should be improved



(Poon *et al.*, 2009), particularly important when healthcare services are implemented at scale; e.g. across entire jurisdictions – where the activity and scope will be much greater. Cancer Care Ontario (CCO) is an umbrella organization that coordinates cancer services for 14 million people. Staff collect, monitor and report information about cancer and system performance (www.csqi.on.ca/), develop evidence-based standards and treatment guidelines and work with regional providers to plan, improve and implement cancer services. In 2008, Ontario's Ministry of Health and Long Term Care managers funded CCO to accelerate IMRT, reduce disparities across cancer centres and improve patient access to excellent, high quality care without lengthening waiting times. IMRT, which delivers high radiation-doses to cancerous tumours while significantly decreasing radiation damage to surrounding healthy tissues (Webb, 2003; De Meerleer *et al.*, 2004), is an effective treatment for several cancers (Veldman *et al.*, 2008; Staffurth, 2010). We describe province-wide IMRT deployment in Ontario, summarize the IMRT Project evaluation and highlight the lessons learned.

Methodology

To ensure safe and high-quality care, CCO staff develop and implement targeted quality improvement initiatives. Cancer Care Ontario's 2008-2011 Ontario Cancer Plan (Cancer Care Ontario, 2008, p. 19) recommended that comprehensive approach to “ensure that all [cancer centres] have the technology and know-how to safely and efficiently deliver IMRT”. Similarly, an organizational standard guideline (Whitton *et al.*, 2009) was published, which recommended IMRT as the care standard. These recommendations led to the three-year (2008-2011) IMRT Project, guided by an implementation framework (Figure 1) that focused on three main goals, to: improve access to IMRT for all eligible patients, ensure appropriate IMRT use and ensure the highest quality IMRT. Access was defined as ensuring that all eligible patients are able to receive IMRT in their region; appropriate use was defined as IMRT utilization that reflects the best-available evidence; and highest-quality was defined as IMRT delivery that is safe, standardized and expert-based.

The framework, coupled with the the widely used Plan-Do-Study-Act (PDSA) Cycle (Berwick, 1996), was used throughout the IMRT Project. CCO staff engaged regional partners and clinical experts in planning, reviewing and implementing IMRT Project stages. Additionally, needs assessments were conducted yearly with the radiation treatment community to track progress and determine each centre's IMRT requirements. To meet the goals and objectives set out in the framework, the following initiatives were implemented: one-time funding allocation to all centres to support implementation; developing evidence-based guidelines and corresponding IMRT utilization targets in ten disease sites; conducting cost-effectiveness analyses comparing IMRT to 3D-conformal radiation therapy for prostate and head and neck cancer; establishing a provincial IMRT external collaborative quality assurance (CQA) program and delivering educational courses, expert coaching and networking activities. These initiatives were based on recommendations derived from the organizational standards guideline (Whitton *et al.*, 2009), which highlighted safety, expert-based training and a coordinated provincial effort. This approach was also supported by the literature, which suggests that multifaceted interventions are more effective at changing practice (Grimshaw *et al.*, 2004; Chaillet *et al.*, 2006). Additionally, the literature suggests that educational and training components should be interactive and engaging (Davis *et al.*, 1995; O'Brien *et al.*, 2001). The final IMRT Project phase included evaluating these various initiatives to determine whether they were effective; determining if IMRT utilization increased and identifying

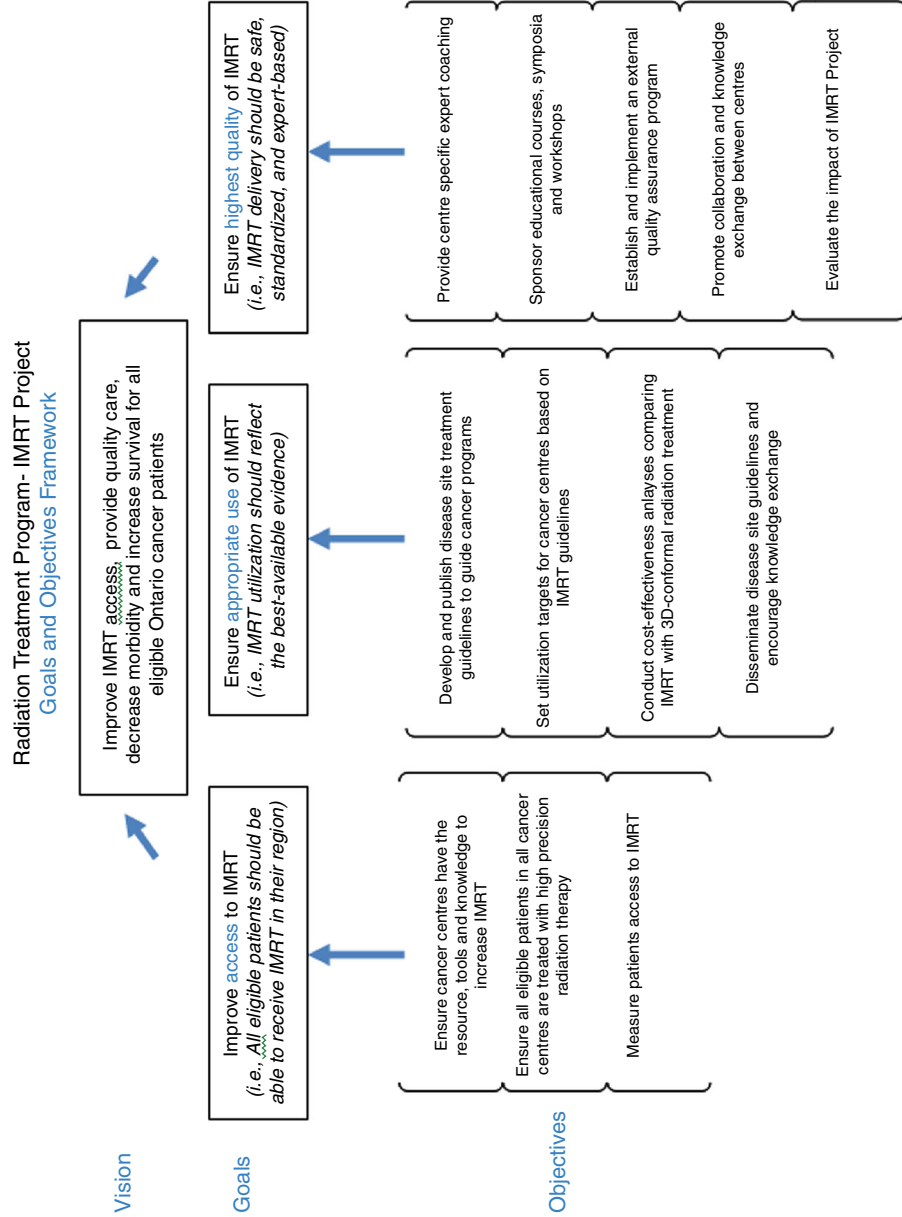


Figure 1.
IMRT project goals and objectives framework

lessons learned. Cost-effectiveness analyses were still under development and since have been published elsewhere (Yong *et al.*, 2012a, b; Létourneau *et al.*, 2013). The evaluation was informed by the literature describing jurisdictional approaches (Reeves *et al.*, 2008; Rozenblum *et al.*, 2011) and recognized well-established evaluation tools and resource guides (W. K. Kellogg Foundation, 2010; Bowen, 2011).

Our evaluation included document analysis, interviews and a province-wide electronic survey. The document analysis included publicly available documents, CCO Radiation Treatment Program documents and documents acquired from key informants. To obtain an accurate provincial representation, six from 14 cancer centres were chosen based on IMRT utilization, location, population, academic affiliation and size. In six cancer centres, semi-structured, interviews were conducted with senior administrators (regional vice presidents and regional administrative directors), radiation oncology, physics, and radiation therapy managers. Purposive sampling was used to include individuals directly involved in the implementation process. Two pilot interviews were at a seventh cancer centre tested the interview guide. Questions were reviewed and revised based on the pilot. To gather feedback from frontline staff, the interview guide was used as the basis for a province-wide electronic survey (40 questions), which included skip patterns for items not relevant to the participant, based on their individual responses. Most questions used a five-point Likert scale (Appendix). The questionnaire was sent electronically to radiation department heads and managers, who were asked to forward it to frontline staff for completion. Three survey reminders were sent following the original invitation. The interview and survey questions were based on prior research (Øvretveit *et al.*, 2007), were pilot tested and refined based on consultations with experts. These refinements ensured face-validity, relevance to the IMRT Project and captured information necessary to evaluate the implemented initiative's effectiveness. Patients were not included in the study sample as they had limited involvement in the implementation process. Data gathered in the document analysis were extracted using a worksheet. Survey data were gathered using Survey Monkey, recorded and transcribed verbatim as text documents and uploaded into qualitative data management and analysis software (NVivo 10). We developed a coding structure with a second investigator who independently coded a randomly selected sample (18 per cent) of interview transcripts at onset and midpoint. The coding process was compared and discussed to validate the coding strategy and ensure consistency in data interpretation.

Findings

Document analysis, interviews and the survey generated insightful results. Over 200 documents were located, which were related to initiatives undertaken during the three year IMRT Project, including reports, project plans and proposals, surveys, needs assessments, spread sheets, letters, e-mails, memos, meeting minutes and presentations. Three centres were smaller, served a mixed urban and rural population and were treating less than 9 per cent of patients with IMRT in 2010. The remaining centres were larger, served a mostly urban population and treated between 10 and 35 per cent of patients with IMRT in 2010. In total, 21 from 30 individuals formally invited to participate agreed to be interviewed (three administrators, five radiation oncology, six physics and seven radiation therapy managers). All regional directors declined the invitation to participate stating that they were too far removed from the IMRT Project to comment. The interviews lasted around 24 minutes (range 15 to 44 minutes). All key informants agreed to have their interview

audio recorded. Overall 266 electronic questionnaires were returned; 13 (5 per cent) from radiation oncologists, 32 (12 per cent) from physicists and 221 (83 per cent) from radiation therapists and dosimetrists. There was at least one respondent from each cancer centre. At onset, a CCO IMRT implementation team was created to communicate, coordinate and implement various initiatives comprising the IMRT Project. The implementation team communicated primarily with administrators and department managers at each cancer centre, expecting that information would be passed on to frontline staff. During the interviews, all key informants stated that they were very familiar with the IMRT Project. Conversely only 64.5 per cent of survey respondents stated that they were either very or somewhat IMRT Project aware. This result may be explained by the fact that the survey included frontline staff respondents (86.5 per cent) who did not directly receive communications regarding the IMRT Project.

Funding

One-time funding was provided to enable cancer centres to participate in IMRT implementation, specifically intended for activities that supported centre staff to improve access to IMRT (e.g. maintaining access to radiation treatment services while staff attend IMRT coaching, education and start-up activities). Centre staff were required to submit an implementation plan upon receiving the funds. Most key informants felt that the funding initiative was either effective or somewhat effective, stating that the funding encouraged: attendance at education and training activities, sharing responsibility for IMRT implementation amongst several staff, purchasing items (e.g. treatment planning licences), efficiencies in treatment planning (e.g. treatment scripting, which increased capacity) and hiring supplementary staff. Some respondents stated that funding would have been more effective if it was available earlier in the implementation process and if cancer centre staff had more freedom to spend it as they wished, particularly on equipment (Table I).

Evidence-based guidelines and utilization targets

To promote appropriate IMRT use, treatment guidelines were developed for the following disease sites: prostate (Bauman *et al.*, 2012), head and neck (O'Sullivan *et al.*, 2012) gynecology (D'Souza *et al.*, 2012), breast cancer (Dayes *et al.*, 2012) and lung cancer (Bezjak *et al.*, 2012). Guidelines were also developed and posted on the CCO web site for central nervous system (CNS), soft tissue sarcoma, thyroid, gastrointestinal and skin cancer (Cancer Care Ontario, 2012). The guidelines included a comparative evidence review between IMRT and standard treatments summarizing IMRT's potential benefits and identifying the patient population for whom IMRT was the preferred treatment. Representatives from CCO and the centres, determined regional improvement targets for increasing concordance between IMRT services and the guidelines, introducing and operationalizing IMRT for additional eligible disease sites and meeting previously set quality standards (Whitton *et al.*, 2009). The IMRT data are monitored by CCO staff and reported to the cancer centres quarterly through provincial quality performance meetings. Overall, provincial IMRT utilization targets were set for six out of ten disease sites (prostate 90, thyroid 75, head and neck 90, CNS 75, sarcoma 80 and breast 90 per cent). These targets were defined as the percentage of patients being treated with radical radiation therapy using IMRT techniques. Additionally, the five-year CQA program results (Létourneau *et al.*, 2013), which was developed to assess static and rotational IMRT planning and delivery performance across Ontario, provides insights on standardization and treatment quality. Most interview respondents stated that guidelines

Initiative	Selected quotes from respondents
Funding	<p>“Monies that have been provided to us from CCO have really helped us to educate a broader number of employees. So when people go on conferences and vacations, it’s a lot easier to sustain your IMRT program because a lot of people are basically part of the initiative.” (Radiation Oncologist)</p> <p>“The implementation support has been probably one of the most valuable for us because it enabled us to hire a part-time physics associate to perform a lot of these patient specific measurements in the evening. That has been extremely useful to us, I do hope that it continues but I understand that it’s a finite pot” (Physicist)</p>
Guidelines and utilization targets	<p>“The guidelines and the targets, those were extremely, extremely helpful. In bringing forward any new technology the question is ‘should we? shouldn’t we? what’s the evidence?’ [...] so the initiative to develop those guidelines and use them [...] is actually right on the money, right where we should be going.” (Radiation Oncologist)</p> <p>“Everything we do [...] is because we start from a place of patient safety, from a standpoint of improved patient outcomes, we’re wanting to improve quality of care. So the guideline and the [utilization] target is everything.” (Administrator)</p> <p>“[...] they are useful because it gets everybody on the same page and these guidelines are negotiated with our administration.” (Radiation Oncologist)</p>
Education	<p>“It basically increased the knowledge of more people within the program so instead of having expertise in small groups you now have a lot more depth, you now have a lot more people who are able to do comprehensive quality assurance and are able to [...] simply participate in IMRT.” (Physicist)</p> <p>“The education was really key for us in being able to go forward a little bit further and think about more [disease] sites for IMRT” (Radiation Therapist).</p>
Coaching	<p>“When you have an expert come and say ‘yeah you’re on the right track, this is good, and maybe you should do better with this, look at this a little bit differently, etc, that really solidifies that you’re on the right track.” (Radiation Oncologist)</p> <p>“The most effective was the on-site coaching. The main reason is that we could capture a lot of staff when we have someone here on-site as opposed to sending them to a course or a conference. And it really lets people use what they are used to using on a daily basis. So it’s much easier for them to grasp the concepts and if they have questions it absolutely pertains to what they are doing on a daily basis” (Radiation Therapist)</p>

Table I.
Selected quotes
regarding the IMRT
project initiatives

and targets were helpful and effective in setting benchmarks, providing guidance and in driving the implementation process, especially at the senior administration level. Respondents stated that the guidelines and targets played a large role in adopting IMRT among hesitant radiation oncologists. However, the survey results demonstrated that limited knowledge existed about the guidelines and targets in the province (only 44 per cent of survey respondents knew the guideline aware and only 40 per cent knew the targets). Timely, high quality evidence in relation to novel radiation technology was listed as a barrier, as was poor provincial consultation during guideline development and confusion surrounding the IMRT definition.

Educational activities

Several IMRT and IMRT-related educational courses were offered (e.g. disease specific IMRT, image-guided radiation treatment and imaging matching). Partial funding was made available for attendance at workshops, symposia and conferences, which were based on needs assessment requests from the radiation community. The educational

courses were provided to ensure that all centre staff developed the required knowledge to increase IMRT utilization safely and effectively and decrease treatment variation. Most (88.5 per cent) respondents who attended the courses found them very or somewhat helpful. Interview and survey respondents stated that the courses increased skills, built confidence, offered reassurance in the IMRT implementation process and broadened their knowledge. Similarly, workshops and symposia were well received, particularly because they provided an opportunity for collaboration and information exchange with other participants from across the regions. As one survey respondent commented, the workshops and symposia were an “excellent forum that enabled networking and standardization of knowledge and interpretation, essential to establishing [...] a community of practice in Ontario” (Physicist). Suggestions for improvement included offering courses and workshops in a more accessible format; e.g. online and to engage more experts from across the province (Table II).

Expert coaching

Funding was provided for expert coaching, to share best practices and offer hands-on training and troubleshooting. Coaching was defined as directing, instructing and training groups to achieve certain goals or develop specific skills. Document analysis showed that over the years, significant interest had been expressed for targeted support, such as coaching from peer experts; e.g. radiation oncologists were interested in receiving one-on-one contouring training from experts; physicists expressed interest in receiving assistance in establishing new technology, while radiation therapists were keen on receiving hands-on education on cross-sectional anatomy for soft tissue image matching. Coaching was on-going during this evaluation, hence only 28 per cent of survey respondents stated that they had received on site-coaching. However, 75 per cent receiving on-site coaching said that it was either very or somewhat helpful (22 per cent were “unsure”). In addition to expanding their skills, respondents stated that having an expert visit the centre helped to develop IMRT programs, reinforced service quality and identified areas for improvement. Concerns

Course/Conference	Radiation oncologists ^a	Medical physicists ^b	Radiation therapists/dosimetrists ^c	Total participants (n = 1,028)
5 IMRT courses (2008-2011)	38 (24%)	62 (53%)	108 (14%)	208 (20%)
8 Image guided radiation therapy courses	39 (24%)	42 (36%)	76 (10%)	157 (15%)
7 image matching courses	n/a	n/a	83 (11%)	83 (11%)
<i>COMP Winter School Conference</i>	2 (1%)	7 (6%)	6 (1%)	15 (2%)
Physics Meeting 2010	n/a	70 (59%)	n/a	79 (59%)
Physics Meeting 2011	n/a	67 (57%)	n/a	67 (57%)
Physics Meeting 2012	n/a	73 (62%)	n/a	73 (62%)
<i>IMRT Insights Conference 2010</i>	57 (36%)	33 (28%)	52 (7%)	142 (14%)
<i>IMRT Insights Conference 2011</i>	41 (26%)	38 (32%)	55 (7%)	134 (13%)

Table II.
IMRT Education breakdown: professionals who attended courses and conferences

Notes: n/a, not applicable; COMP, Canadian Organization of Medical Physicists. ^aEstimated number of radiation oncologists in Ontario = 160; ^bEstimated number of medical physicists in Ontario = 118; ^cEstimated number of radiation therapists/dosimetrists in Ontario = 750

included the initiative's late timing (since some centres were already treating patients with IMRT), glitches with administrative logistics (e.g. communication challenges and difficulties completing the project protocol and the billing process), the initiative's short duration and coaches' limited expertise with some specialized software.

General observations

Without intervention, most interview respondents stated that their centre would not be where it is today regarding IMRT utilization, mostly because the initiative encouraged guideline adherence and stimulated momentum. While some respondents stated that it was hard for them to gauge where they would have been without the initiatives because they had been already using IMRT for several years, they acknowledged that the initiatives increased expertise and IMRT knowledge at their centres. As one interview respondent explained:

“[...] if you looked at us before and after [...] our statistics probably wouldn't be much different, but if you look at our depth of knowledge, our depth has increased dramatically with the initiative” (Physicist).

Most interview respondents also stated that CCO's measuring and reporting IMRT utilization encouraged efficient resource use, raised service quality and motivated cancer centre staff to increase IMRT utilization, particularly by engaging senior administrators in the discussion. When asked to offer recommendations to improve future province-wide implementation projects, respondents highlighted additional training/education and increased communication efforts. Frontline staff, expressed concerns about poor information sharing, indicating that they were unaware of opportunities being offered. At the IMRT Project's outset, there was significant variation in treatment availability across Ontario, with only six of 12 centres delivering IMRT. Following the IMRT Project, patients had access to IMRT treatment at all 14 centres in the province. There has been a dramatic increase in the percentage being treated for curative intent with IMRT. In 2008/2009, only 9,000 patients were treated with IMRT, increasing to 23,000 patients in 2013/2014. Evidence-based guidelines and targets helped to standardize radiation treatment across the cancer centres. In 2008, those six centres providing IMRT had utilization rates ranging from approximately 1 to 55 per cent. Following the IMRT Project, utilization steadily increases and the provincial targets have been met for five of six disease sites (Table III). In the fiscal years 2008/2009 to 2012/2013, the absolute increase in IMRT utilization was: prostate 46, thyroid 36, head and neck 29, sarcoma 30, and CNS 32 per cent. Most importantly, utilization has increased without affecting waiting times or safety. Thus, the initiatives implemented during the IMRT Project appear to have successfully addressed framework goals.

Lessons learned

The initiatives implemented during the IMRT Project have identified several lessons for future projects. Regularly conducting needs assessments allowed the project team to better meet implementation needs, especially around changing educational and training requirements. Evidence-based guidelines helped standardize radiation treatment across the province and encouraged radiation oncologists, who are key players, to support and champion the change. Tracking utilization targets at a provincial level ensured that senior administrators were involved and held accountable for their organization's progress. The coaching initiative provided training at the point

Table III.
Provincial IMRT
utilization targets

Disease site	IMRT disease site calculation	Target (%)	Fiscal year ^a 2008/2009 (%)	Fiscal year 2009/2010 (%)	Fiscal year 2010/2011 (%)	Fiscal year 2011/2012 (%)	Fiscal year 2012/2013 (%)
Prostate	Total no. of radical IMRT and Brachytherapy courses (intact prostate, inverse planning only) delivered to Prostate Body region code /	90	53	68	83	96	99
Thyroid	Total no. of radical courses delivered for prostate cancer (intact prostate) delivered to Prostate Body region code (Note: Excludes courses to pelvis) Total no. of radical IMRT courses delivered for Thyroid Cancer (inverse planning only) /	75	60	81	82	88	96
Head and neck	Total no. of radical courses delivered for Thyroid Cancer Total no. of radical IMRT courses delivered for Head and Neck Cancer (inverse planning only) /	90	66	71	90	96	95
Central Nervous System	Total no. of radical courses delivered for Head and Neck Cancer Total no. of radical IMRT and Stereotactic courses delivered for Central Nervous System Cancer (inverse planning only)	75	46	59	69	77	78

(continued)

Disease site	IMRT disease site calculation	Target (%)	Fiscal year ^a 2008/2009 (%)	Fiscal year 2009/2010 (%)	Fiscal year 2010/2011 (%)	Fiscal year 2011/2012 (%)	Fiscal year 2012/2013 (%)
	/						
	Total no. of radical courses delivered for Central Nervous System Cancer						
Sarcoma ^b	Total no. of radical IMRT courses delivered for Sarcoma Cancer (inverse planning only)/ Total no. of radical courses delivered for Sarcoma Cancer (Note: Excludes Kaposi sarcoma, mesothelioma and female genitalia organs)	80	48	60	62	70	78
Breast	Total no. of radical IMRT courses delivered for Breast Cancer to right breast body region and to left breast body region (forward and inverse planning) / Total no. of radical courses delivered for Breast Cancer to right breast body region and left breast body region (boost excluded from calculation) (Note: Courses with 5 or less fractions to right and left breast body region were excluded as it is assumed they are boosts)	90	-	-	-	96	96 ^c

Notes: ^aFiscal year is calculated as the period between April 1st and March 31st; ^bdue to low volumes the sarcoma target has not been met; ^cbreast IMRT data has stabilized at 96 per cent as of Fiscal Quarter 4 2012/2013

of care with immediate feedback from experts who work in a similar setting. These initiatives were effective and should be encouraged and expanded in future projects. However, the IMRT Project also demonstrated the need for stronger avenues for clear, continuing and comprehensive communication at all implementation stages, to increase awareness, garner support and encourage participation. For example, provincial input was sought when developing guidelines and targets; however, some respondents, particularly frontline staff, did not know about these opportunities. Hence wider engagement, perhaps via online forums, where updates, questions and experiences can be shared in real time, should be employed. Additionally, expert coaching was found to be more effective if centre staff were able to choose the individuals from whom they wanted to receive coaching, rather than using set CCO approved experts. Since each centre was at a different implementation stages and was using assorted equipment and software, this approach ensured that staff received relevant coaching that was applicable to their context. Patients had little exposure to this project; however, CCO staff recently embraced a person-centred care strategy that will have a large impact on future initiatives. Going forward, it is important to ensure that patient's views are increasingly sought for developing, implementing and evaluating health services at the system level.

Originality/value/implications

Treatment techniques used in radiation oncology are intricate and rapidly evolving. Similar to surgery, radiation treatment is a complex procedure that cannot be easily learned from books and lectures; it requires guided hands-on training. This is likely why, the innovative coaching initiative, piloted in this project, proved effective. Accordingly, this approach should be studied further, given that it improved rapid knowledge transfer and relationship building between centres that were previously working in silos. Despite tools offering suggestions on how to best translate research and evidence into practice (Ward *et al.*, 2009; Stetler *et al.*, 2011; Chatfield *et al.*, 2013) recommendation uptake from guidelines and advice reports remain inadequate (Kendall *et al.*, 2009; Boaz *et al.*, 2011; Grimshaw *et al.*, 2012; Gainforth *et al.*, 2013.). Fortunately, the IMRT Project demonstrates that a multifaceted approach that focuses on evidence-based standardized treatment, performance target monitoring, safety and tailored education, hands-on training, can help ensure that treatment recommendations are implemented safely and quickly across a wide jurisdiction. The initiatives presented in this implementation approach may also be helpful in overcoming recently reported barriers to IMRT implementation (Mayles, 2010, Bak *et al.*, 2011). While IMRT uptake has been rapid in the USA (Mell *et al.*, 2005), it has been much slower elsewhere; e.g. in the UK (Burnet *et al.*, 2012; Beardmore, 2011). In 2008, only 2 per cent of UK patients received IMRT; however, in 2012, IMRT increased to 15.3 per cent following a national training programme (Cooper and Williams, 2012). Perhaps the multifaceted implementation approach, described in this paper, may further assist in increasing IMRT utilization in the UK and other jurisdictions.

Conclusions

This evaluation demonstrates that a multifaceted, jurisdictional approach that includes elements addressing funding allocation, evidence-based guidelines, utilization targets, expert coaching and educational activities can be successful in driving and implementing complex techniques such as IMRT. The initiatives implemented during CCO's IMRT Project have shown to be largely effective in expanding IMRT expertise

and increasing utilization. This evaluation offers valuable recommendations for future jurisdiction-wide implementations, in Ontario and elsewhere. Generally, it may interest practitioners who are exploring ways to fund, implement and sustain complex and evolving technologies or programmes.

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Appendix. Survey questions

Preamble

In 2008 Cancer Care Ontario’s (CCO) Radiation Treatment Program (RTP) commenced the IMRT Project and committed to the following goals:

- (1) improve access to IMRT for all eligible patients;
- (2) ensure appropriate use of IMRT; and
- (3) ensure the highest quality of IMRT implementation.

The RTP has been successful in implementing the following innovative initiatives to meet each of these objectives:

Guidelines/Targets: develop evidence-based, disease site specific guidelines and targets for IMRT use in order to clearly define patient eligibility and ensure current techniques reflect evidence-based and care.

Resources: ensure that cancer centres have resources to start the IMRT implementation in a safe and efficient way. (Note: the purchase of new technology was outside the scope of this project).

Implementation team: create an implementation team, composed of a strong clinical lead, project manager and project coordinator to drive the implementation process of IMRT across the province.

Coaching: provide funding to enable expert based coaching to take place across the centres in order to share best practices, offer hands-on training and troubleshooting that expedites the implementation of IMRT.

Education: develop training courses, symposia and workshops to ensure that all professional staff involved in IMRT delivery continues to build their IMRT knowledge by attending these educational programs.

The purpose of this survey is to determine the strengths and weaknesses of these initiatives and to highlight lessons learned for the future implementation of health technology at a provincial level. Please take a few moments to complete this survey. Your answers will remain anonymous. By completing the questions in this survey informed consent is considered to be given.

1. Please identify your cancer centre:
2. Please indicate your position:
Radiation Oncologist
Medical Physicist
Radiation Therapist
Dosimetrist
Other (please specify)
3. Please indicate if you are:
Front line staff
Administrative/Management staff
4. Please indicate your age group:
20-30
31-40
41-50
51-60
60 +
5. Please indicate your gender:
Male
Female
6. How aware are you of CCO's IMRT Implementation Project?
Very aware somewhat not very aware unaware

Please explain:

Resources

7. How helpful was the one-time IMRT implementation funding your centre received from the IMRT Project?
Very helpful Somewhat helpful Unsure Not very helpful Not at all helpful

Please explain:

If answer unsure question 7b will not appear

7 (a). Please explain how your cancer centre used the funding.

8. Were there any IMRT implementation costs that were not covered, that you felt should have been?

Yes No Unsure

If yes, please explain:

Implementation Team

9. How effective was the CCO Implementation Team (e.g. Dr Padraig Warde, Eric Gutierrez and Elizabeth Murray) at coordinating the provincial IMRT Project?
Very effective Somewhat effective Unsure Not Very effective Not at all effective

Please explain:

10. How effective was the CCO Implementation Team at communicating the initiatives of the provincial IMRT Project?

Very effective Somewhat effective Unsure Not Very effective Not at all effective

Please explain:

Guidelines and Targets

11. Are you aware of the CCO's Program in Evidence-Based Care disease site guidelines for IMRT?

Yes No

If answer is no question 11b will not appear

11 (a) How helpful were the disease site guidelines in providing guidance to you?

Very helpful Somewhat helpful Unsure Not very helpful Not at all helpful

Please explain:

12. Are you aware of the IMRT disease site specific targets?

Yes No

If answer is no question 12a will not appear

12 (a) How helpful were the IMRT disease site specific targets in providing guidance to you?

Very helpful Somewhat helpful Unsure Not very helpful Not at all helpful

Please explain:

13. Did the fact that CCO was measuring and reporting on IMRT utilization influence your centre's decision to implement/increase availability of IMRT treatment?

Yes No Unsure

Please explain:

Coaching

14. Did you receive on-site coaching?

Yes No No, but would have liked to Not applicable

If answer is no question 14a will not appear

14 (a) How helpful were the on-site coaching visits to you?

Very helpful Somewhat helpful Unsure Not very helpful Not at all helpful

Please explain:

Education

15. Did you attend any of the CCO IMRT courses at PMH?

Yes No Not applicable

If answer is no question 15a will not appear

15 (a) How helpful was the CCO IMRT course at PMH?

Very helpful Somewhat helpful Unsure Not very helpful Not at all helpful

Please explain:

16. Did you attend any of the CCO IGRT courses at PMH?

Yes No Not applicable

If answer is no question 16a will not appear

16 (a) How helpful were the CCO IGRT courses at PMH?

Very helpful

Somewhat helpful

Unsure

Not very helpful

Not at all helpful

Please explain:

17. Did you attend the CCO Radiation Therapist courses in Volumetric Image Guidance for IMRT Verification at PMH?

Yes No Not applicable

If answer is no question 17a will not appear

17 (a) How helpful were the CCO Radiation Therapist courses in Volumetric Image Guidance for IMRT Verification?

- Very helpful
- Somewhat helpful
- Unsure
- Not very helpful
- Not at all helpful

Please explain:

18. Did you attend CCO's February 2010 and/or March 2011 Physics VMAT/Rapid Arc Symposiums?

- Yes No Not applicable
- If answer is no question 18a will not appear

18 (a) How helpful were CCO's February 2010 and/or March 2011 Physics VMAT/Rapid Arc Symposiums?

- Very helpful
- Somewhat helpful
- Unsure
- Not very helpful
- Not at all helpful

Please explain:

19. Did you attend CCO's 2010 COMP Winter School in Banff, Alberta?

- Yes No Not applicable
- If answer is no question 19a will not appear

19 (a) How helpful was CCO's 2010 COMP Winter School in Banff, Alberta?

- Very helpful
- Somewhat helpful
- Unsure
- Not very helpful
- Not at all helpful

20. Did you attend CCO's 2010 IMRT insights conference entitled "IMRT Insights: Transforming Practice through Collaboration"?

- Yes No Not applicable
- If answer is no question 20a will not appear

20 (a) How helpful was CCO's 2010 IMRT insights conference?

- Very helpful
- Somewhat helpful
- Unsure
- Not very helpful
- Not at all helpful

Please explain:

21. Did you attend CCO's 2011 IMRT insights conference entitled "On Target, On Track"?

- Yes No Not applicable
- If answer is no question 21a will not appear

21 (a) How helpful was CCO's 2011 IMRT insights conference?

- Very helpful
- Somewhat helpful
- Unsure
- Not very helpful
- Not at all helpful

Please explain:

22. During the IMRT Project implementation period (2008-present) did you receive any other, non-CCO, IMRT related training?

Yes

No

Not applicable

Please explain:

23. Using a scale of 1 to 6 please rank the IMRT Project initiatives in terms of most effective to least effective (with 1 being most effective and 6 being least effective).

Evidence-based disease site guidelines —

IMRT disease site targets for performance monitoring —

One time implementation funding —

On-site coaching visits —

Educational initiatives (courses, symposia, etc) —

24. In terms of IMRT utilization would your centre be where it is today if CCO had not provided these initiatives?

Yes Unsure No

Please explain:

25. In your opinion was the province wide IMRT implementation approach appropriate?

Yes Unsure No

Please explain:

26. What recommendations would you make to help improve future province wide implementation projects?

Please explain:

27. What do you think the Radiation Treatment Program at CCO should focus on next?

Please explain:

28. Do you have any additional comments?

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