

CLINICAL SPECIALIST RADIATION THERAPIST (CSRT) DEMONSTRATION PROJECT

SUMMATIVE EVALUATION

RADIATION THERAPY
Advanced Practice in Ontario



FINAL REPORT
MAY 25TH, 2010

TABLE OF CONTENTS

EXECUTIVE SUMMARY	6
1.0 INTRODUCTION	9
1.1 Organization of the report	10
2.0 STRATEGIC ALIGNMENT	11
2.1 Project Goals	11
2.2 Project Alignment	11
3.0 EVALUATION AND RESULTS	13
3.1 Evaluation Methodology	13
3.2 Internal Monitoring and Evaluation	14
3.3 Data and Methodological Challenges	14
3.4 Final Results	15
3.4.1 Wait Times	15
3.4.2 Access to Care	19
3.4.3 Stakeholder Outcomes	25
3.4.4 Patient Safety	31
3.4.5 Education and Training	31
3.5 Summary of Findings	32
3.6 Challenges and Lessons Learned	33
3.7 Outcomes and Success	34
4.0 RECOMMENDATIONS FOR SUSTAINABILITY	37
4.1 Recommendation	37
4.1.1 Partners	37
4.2 Sustainability Plan	38
4.2.1 Sustainability Plan Budget	42
4.3 Conclusions	43
5.0 APPENDICES	44
Appendix A – Project Background	44
Appendix B – Draft Competency Profile	47
Appendix C – Position Descriptions	55
Appendix D – Wait Times Data	60
Appendix E – Concordance Data	63
Appendix F – Competency Scores	67

Appendix G – Process Innovations/Enhancements	68
Appendix H – Patient Satisfaction Data	76
Appendix I – Radiation Therapist Job Satisfaction Data	78
Appendix J – Direct Supervisor Interviews	79
Appendix K – Front line and Second line Stakeholders	82
Appendix L – Broad Stakeholder Consultation Summary	88
Appendix M – Models of Care Report	90

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- Sarah Costa, Adriane Castellino, Deb Loach

The Clinical Specialist Radiation Therapist

Clinical Specialist Radiation Therapists (CSRTs) are medical radiation technologists, registered with the College of Medical Radiation Technologists of Ontario (CMRTO) in the specialty of radiation therapy. A CSRT uses his or her advanced clinical, technical and professional competencies to work in collaboration with other members of the health care team in their particular area of specialization.

interprofessional team

flexibility

collaboration

responsiveness

maximizing skills

reducing wait times

fluidity

enhancing service

evidence-based

EXECUTIVE SUMMARY

The increasing burden of cancer coupled with human resource pressures pose significant challenges to the delivery of timely, quality radiation therapy to patients across Ontario. In the face of such challenges and the growing recognition that collaborative health care could improve patient care and outcomes the Ministry of Health and Long-Term Care (MOHLTC) funded a series of projects to investigate a new health care provider role – the “clinical specialist radiation therapist” (CSRT). Announced as part of the HealthForceOntario initiative in 2006, the CSRT Demonstration Project aligns with many of the cancer system priorities in the province including the development of new innovative health care provider roles that could contribute to effectiveness and efficiency of the existing system and ultimately improving the health outcomes, as outlined in the 2008 – 2011 Ontario Cancer Plan.

The CSRT is a registered medical radiation technologist in the specialty of radiation therapy who brings his or her advanced clinical, technical and professional radiation therapy competencies to the existing interprofessional health care team. This innovative role arose out of work being done at the profession level to assess the applicability of advanced practice roles being developed internationally to Ontario. Building on this work, the Ministry provided funding to Cancer Care Ontario (CCO) to support and evaluate the impact of pilot CSRT positions on the existing radiation therapy treatment system.

“[The CSRT] has made the process more efficient so I could see more patients in the clinic because the CSRT could take over some of my responsibilities . . . if I knew the CSRT was coming to clinic . . . I could actually accept an extra patient.”
[Direct Supervisor, PMHI]

The “Model for Improvement”, from the Institute of Healthcare Improvement, was used for the collection of both quantitative and qualitative data. This new role was assessed for its ability to address systematic pressures in the existing model of care at various critical points across the patient care pathway. Following the development of a vision and definition for this new advanced practice role, ten positions were integrated into local radiation therapy programs utilizing a peer review process. The CSRTs began building an evidence base documenting the many positive impacts each was having on their particular programs, partners and patients. This data collection took place across all phases of the project (Phases I, IE, IE2, and II).

As the data collection phase of these series of projects draws to a close, analysis of the evidence shows eight key findings:

Finding 1:	CSRTs can be educated and trained to competently and safely undertake advanced practice involving specific activities traditionally performed by radiation oncologists, through delegation of activities or the creation of medical directives.
Finding 2:	CSRTs can improve the efficiency of the system by improving patient wait-times across the patient care pathway, increasing patient throughput and facilitating time efficiencies for team members. These impacts combine to build system capacity in their specific programs.

Finding 3:	CSRTs can improve quality and effectiveness of existing systems and processes by streamlining activities, eliminating redundancies and developing innovative approaches to program activities and adding new services to those systems.
Finding 4:	Patients are highly satisfied with the care they received from CSRTs. Satisfaction with their care was rated as either equal to or higher than the care they received from the other team members.
Finding 5:	CSRTs have become valued members of the teams in which they work facilitating improved workflows and enhanced team functioning and cohesiveness.
Finding 6:	The CSRT competency profile allows for the development of diverse positions that align with specific local needs including improved effectiveness and efficiency and/or innovation and accelerated knowledge translation.
Finding 7:	Maximum success for CSRT integration is achieved when positions are developed to clearly address specific local needs in the radiotherapy care pathway and when they include specific and measurable outcomes.
Finding 8:	System wide implementation of advanced radiation therapy practice will be most successful through the establishment of formal and consistent graduate level educational requirements and formalized certification/registration processes.

Based on these findings, CCO is recommending a plan to formalize the CSRT role and implement it consistently province-wide. To this end, CCO has requested funding through a sustainability plan formulating the recommendations of this report. Key elements of the sustainability plan include:

1. Transitional funding for the CSRTs currently in practice allowing radiation treatment departments to assume financial responsibility incrementally over a period of time;
2. A time-limited implementation support team to assist with province-wide roll-out and with ongoing knowledge dissemination;
3. Training allowances to support new positions created prior to 2012 when the academically prepared CSRTs enter the workforce and when province-wide certification processes are available;
4. Continuation of the groundbreaking work with the professional organizations and educational partners on a CSRT certification process and mechanisms to ensure maintenance of practice standards across the province (and beyond); and
5. Continued work on the development of the radiotherapy “model of care” based on the CSRT experiences and project data.

In summary, Cancer Care Ontario believes that the CSRT can be a valued and high-performing member of the interprofessional team, contributing to the provision of high quality, cost effective radiation therapy and care to the people of Ontario while serving as leaders in the advancement of the overall science of radiation therapy.

In this summative evaluation report, we examine the effects of the CSRT role on the key dimensions of quality and access and set out a vision for the future, supported by a proposal for long-term sustainability.

1.0 INTRODUCTION

Ontario's health care system faces many challenges, including increasing costs, an aging population, shortage of health professionals, the introduction of expensive new treatments and technologies, and growing complexity of care. In the coming years, 44% of men and 39% of women are expected to develop cancer. Cancer Care Ontario estimates that by 2017, each day 228 Ontarians will be diagnosed with cancer, and 406,000 people will be living with cancer.¹ In this context, the demand for innovative clinical practitioners and flexible and responsive interprofessional teams has never been stronger.

In response to system demands – and recognizing the value of interprofessional practice² – the Ministry began exploring non-traditional and creative solutions to recurring issues in radiation therapy.³ These efforts ultimately led to the development of the CSRT role and the CSRT Demonstration Project. The CSRT role provided an opportunity to think creatively about traditional and new ways of working, within the context of an interdisciplinary team environment. The work of the CSRT Demonstration Project confirms Cancer Care Ontario's commitment to drive quality, accountability and innovation throughout Ontario's Cancer system.

CSRT Demonstration Project – Project Phases

- Advanced Practice Radiation Therapy (APRT) Development Project (2004-2006)
- CSRT Demonstration Project – Phase I (March 1, 2007 to March 31, 2008)
- CSRT Demonstration Project – Phase I Extension (April 1, 2008 to March 31, 2009)
- CSRT Demonstration Project – Phase II Expansion (August 1, 2008 to March 31, 2010)
- CSRT Demonstration Project – Phase IE² (April 1, 2009 to March 31, 2010)

A detailed background and timeline for the series of projects can be found in Appendix A.

Individual CSRT positions were defined using the draft competency profile (See Appendix B) and customized to address specific and unique pressures that the individual local programs identified. The following positions were the subject of the pilot projects:

PHASE I

1. Patient Assessment and Symptom Management CSRT, Breast Site Group – Princess Margaret Hospital (“PMH”)
2. Target Visualization and Delineation CSRT, Head and Neck Site Group – PMH
3. Palliative Radiation Therapy CSRT – Odette Cancer Centre (“OCC”)
4. Palliative Radiation Therapy CSRT – PMH

¹ Cancer Care Ontario, Ontario Cancer Plan: 2008-2011.

² Institute of Medicine, Crossing the Quality Chiasm: A New Health System for the 21st Century. Washington, D.C.: National Academies Press, 2001.

³ Goodyear, J. Innovative Solutions: New and Expanded Roles in the Healthcare System. Presentation at Cancer Care Ontario Advanced Practice Workshop. Toronto, Ontario, March 26, 2004 (March 26, 2004).

5. Skin Cancer CSRT – OCC

PHASE II

6. Palliative CSRT, Ottawa Hospital Regional Cancer Centre (“OHRCC”)
7. Palliative CSRT, Kingston Regional Cancer Centre (“KRCC”)
8. Tomotherapy and Adaptive treatment for Head and Neck CSRT, OHRCC
9. Metastatic Bone Cancer CSRT, Juravinski Cancer Centre (“JCC”), Hamilton
10. Head and Neck Cancer CSRT, JCC

A more detailed description of each position is provided in Appendix C.

1.1 Organization of the Report

The balance of this report is organized into three main sections.

Section 2 is a review of the project’s goals and strategic alignment.

Section 3 summarizes the evaluation results and findings of the Project, linked to key Ministry priorities including methodologies used in the evaluation, and key strengths, challenges, and limitations of the project. This section focuses on summative results, patterns and trends reported either by Project phase, or combined where appropriate. Due to the volume of information gathered as part of the Project evaluation, detailed data and results accompany the report in Appendix form.

Section 4 sets out recommendations for province-wide implementation of the CSRT role. As submitted in the Sustainability Plan on January 6, 2010, this section identifies the key elements for long term sustainability of CSRT role.

2.0 STRATEGIC ALIGNMENT

2.1 Project Goals

The CSRT Demonstration Project was designed to assess the impact of maximizing the scope of the clinical, technical and professional competencies of qualified, registered medical radiation technologists (radiation therapists) on wait times, access to radiation treatment, on the health of Ontarians. As part of this evaluation, the Project endeavoured to test the viability of the role, evaluate the impact on patients, programs and services, assess the transferability of the role across settings, identify the education and training required to prepare CSRTs for practice, and establish an evidence-base to support decision-making regarding the future of the role.

2.2 Project Alignment

The development of the CSRT role – and implementation of the CSRT Demonstration Project – was closely aligned with core health care system objectives, a number of government initiatives, calls for broader health care system reform, the needs of the Regional Cancer Centres, and the interests of the radiation therapy profession. Among other things, the CSRT agenda is aligned with:

- Key recommendations set out in the 2008 – 2011 Ontario Cancer Plan (and the previous 2005 – 2008 Cancer Plan)
- HealthForceOntario’s new roles initiative
- Cancer Care Ontario’s innovation agenda
- Growing emphasis on increasing interdisciplinary collaboration, eliminating professional territorialism, maximizing scope of practice and flexibility for regulated health professions within the interprofessional team environment
- National and international interest in advanced practice roles for health professionals
- The desire of radiation therapy professionals to increase opportunities within their field thereby enhancing recruitment and retention of professionals
- The interests of departments to find efficiencies, improve care, and optimize intellectual capital

The Project’s alignment with HealthForceOntario and Cancer Care Ontario’s Ontario Cancer Plan are particularly important. HealthForceOntario is the province’s health human resources strategy. This initiative, launched in May 2006, seeks to make Ontario the employer of choice in health care. The initiative confirmed the Ministry’s commitment to ensuring that the province has the right number and mix of health care providers when and where they are needed.

“People should be able to get the right care at the right time in the right setting from the right provider.” (Ontario Health Quality Council, 2009 Report)

One of the key components of the HealthForceOntario strategy involves establishing innovative new health care professional roles in areas of high need, and supporting interprofessional teams. Interprofessional care is the cornerstone of the HealthForceOntario strategy. New role initiatives include nurse-performed flexible sigmoidoscopy, registered nurse first assist, physician assistant, and anaesthesia assistant, as well as the CSRT Demonstration Project that is the subject of this report. The Project, examining the implementation of the CSRT role, was funded as part of this provincial initiative.

Interprofessional care involves the provision of comprehensive health services to patients by multiple health care professionals who work collaboratively to deliver the best quality of care in every health care setting. It encompasses partnership, collaboration and a multi-disciplinary approach to enhancing care outcomes. (HealthForceOntario)

The CSRT Demonstration Project builds on commitments originally set out in Ontario's first Cancer Plan (2005-2008), and reaffirmed in the Ontario Cancer Plan 2008-2011. The Cancer Plan 2008-2011 includes a specific commitment "to develop innovative ways to deliver care through new roles for health professionals and enhance collaboration between disciplines." This commitment is one of many directed at achieving broader goals outlined in the Plan, including:

- Ensuring timely access to effective diagnosis and high-quality, timely and patient-focused care
- Improving the patient experience along every step of the cancer journey
- Improving the performance of Ontario's cancer system

In an effort to achieve these goals, and as part of HealthForceOntario's new roles initiative, Cancer Care Ontario is continuing to work with partners in the province's cancer system to introduce new roles and promote collaborative multidisciplinary teams. The interest in interprofessional care is consistent with health reforms taking place in Canada and around the world. Reform efforts increasingly emphasize the value of collaboration among members of the health care team, and elimination or reduction of demarcations and hierarchical relations, in order to meet the increasingly complex needs of service users.⁴

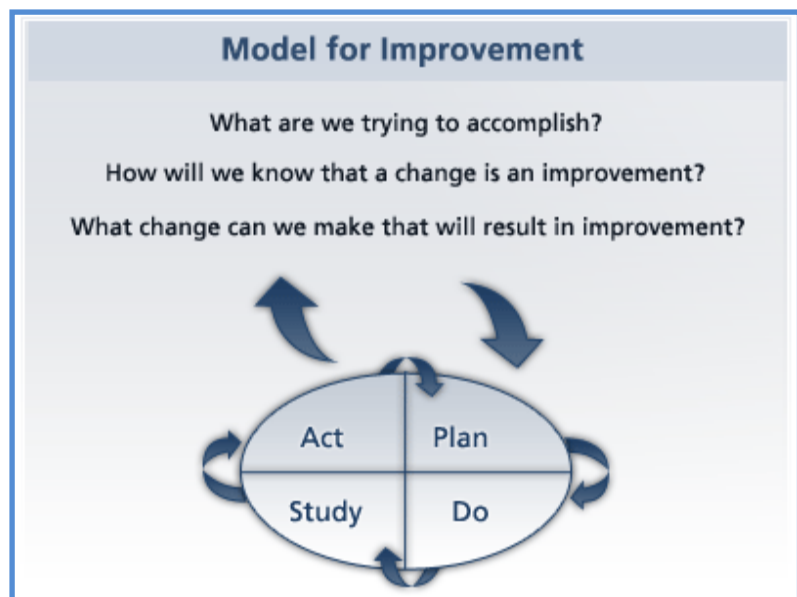
⁴ Cooper, H. and Carlisle, C., et. al., "Developing an evidence base for interdisciplinary learning", *Journal of Advanced Nursing*, 2001, 35(2) at 228.

3.0 THE EVALUATION AND RESULTS

3.1 Evaluation Methodology

Evaluation is a form of applied research concerned with assessing the results, impacts and outcomes achieved by an intervention (e.g., a policy, project or program) in order to inform conclusions about that intervention. The evaluation presented in this report is focused primarily on assessing the impact and effectiveness of the CSRT positions, and improving ongoing and expanded implementation of the positions.

The CSRT Demonstration Project utilized the “Model for Improvement” developed by the Institute for Healthcare Improvement. This model is widely used in quality improvement efforts, including those of the Ontario Health Quality Council.⁵ According to the Model for Improvement, in order to succeed, a quality improvement project or initiative should have a clear aim and track specific measures that demonstrate whether specific changes lead to an improvement. This Model for Improvement guided and informed the work of the CSRT Demonstration Project.



The Project used a mixed methods approach in all phases, employing both quantitative and qualitative tools and metrics, under ethics board approved protocols where appropriate. Where possible, data were aggregated and comparative examples were used. Primary data were collected and compiled by CSRTs and third parties for patient and stakeholder populations. Research assistants conducted stakeholder and key informant interviews (See Companion Document #1 – Standard Measures). Secondary sources, including relevant literature, were also used (e.g., in developing the definition of advanced practice, and assessing appropriate education). Anecdotal case studies from clinics or individual patient experience were used to give real life meaning to the roles and their benefits, or to identify best practices or gaps.

⁵ See, for example, ICES, The Ontario Health Quality Council's 2009 Report on Ontario's Health System.

3.2 Internal Monitoring and Evaluation

It is crucial that innovative interventions such as the CSRT role are accompanied by high-quality evaluation. The Project Team acknowledged that establishment of an effective and consistent internal monitoring program was not given sufficient attention within the early stages of developing and implementing the Project. This led to some early delays in establishing proper performance indicators and reporting systems. The continual demand for monitoring data, while an essential part of the project, imposed a heavy burden on CSRT's who already faced considerable challenges in their demanding new positions. However, after recognizing these early challenges, the Project developed common principles regarding the role, functions and data collection. Enhanced processes for obtaining and collecting data resulted in efficiencies and improvements to data quality.

3.3 Data and Methodological Challenges

While the Project encountered some minor challenges, particularly in the initial phases, in general the CSRT Demonstration Project proceeded without major issues. Three notable data and methodological challenges were:

Patient satisfaction data: During Phase I, some issues were encountered with the collection of patient satisfaction data. Attempts made to overcome some of the barriers to gathering a robust set of patient satisfaction data during Phase I were unsuccessful. Abbreviated forms and approval for conducting interviews via telephone only enhanced accrual to the study marginally. In order to address this gap during that phase, the Project reported on the perceptions of patient experience from CSRTs, direct supervisors of each CSRT, and other stakeholders. This type of indirect data is often reported in the literature when it is difficult or not possible to collect direct data. In the final stage of the Project, research assistants were hired to directly approach patients and assist with completion of the forms where requested or required, with satisfactory results.

Interruption of data collection: Two of the original five Phase I CSRTs took leave during the Phase I Extension. In one case (Palliative CSRT – OCC) the Radiation Therapist taking over the leave was able to continue in the position as originally defined (and the incumbent had prior experience in the program). While the activities undertaken and reported on were the same, the results from this position may reflect the “learning curve” as the new individual moved into the position. For the Breast Cancer CSRT – PMH, the position description changed for the new “CSRT” as the radiation therapist taking on the position had no prior experience with the breast group. This resulted in a revised position being developed and tested during Phase I Extension. However, because the position description was still based on the core “Draft Competency Profile” of the CSRT, the results still contributed to the overall evaluation of the CSRT role.

In addition, the Tomotherapy/Adaptive CSRT position in Ottawa was discontinued in June 2009 due to an unforeseeable extended leave of the incumbent. Although good progress had been made with the position – as was attested to in the direct supervisor interviews - the centre

did not feel there were any other qualified radiation therapists to fill the position. Therefore, data from this position, with the exception of the direct supervisor interviews, are not included in the final data reported here. There is a desire, should transitional funding be available, to re-recruit for the position given staffing changes at the centre.

Methodological issues: Some of the anticipated outcomes take time to materialize, even if the interventions are effective. In addition, some long-term effects of the CSRT implementation are unexpected and therefore not captured as part of the standard effects being measured. While some outcomes are straightforward to measure and correlate directly to the CSRT, others raise methodological challenges associated with identifying and attributing effects to an individual role within the team and isolating them from other changes, process improvements and reforms (i.e., those not directly related to CSRT role). In most cases, however, through triangulation of findings, it is possible to identify the work of the CSRT as a significant contributor to the changes that were observed.

3.4 Final Results

Data collected are diverse and unique. Where appropriate, data have been combined to show project-wide trends and findings. In many cases, due to the uniqueness of each position, data are reported individually or under broad categories of findings. The major categories of data and information collected include:

- Wait times
- Access to care
 - Delegation of activities
 - Concordance data
 - Competence
 - Service enhancement
- Stakeholder outcomes
 - Patient satisfaction
 - Team acceptance
 - Radiation therapists
 - Direct supervisors
 - Stakeholders
- Patient safety
- Education and training

3.4.1 Wait times

Wait time analysis was completed for each of the CSRT positions in all phases of the CSRT Demonstration Project. The impact of the CSRTs on wait times was measured at various points along the patient care journey, depending on the particular CSRT position, and where the CSRT identified procedural inefficiencies or other opportunities for enhancement and

innovation. Results for each of the CSRT positions were categorized according to the following key areas of impact:

A. Care Path Wait Time Reduction: This category is used to describe situations where the CSRTs' contributions enhance efficiency of the system, resulting in patients moving through a portion of the system more quickly, improving the patient's experience.

B. Improved Patient Throughput:

This category describes instances where efficiencies are found that could result in an increase in the number of patients that could be seen or provided service due to a CSRT intervention.

C. Time Efficiencies for Health Care Professionals and Team:

This category quantifies any (potential) time-savings achieved during the Project as a result of CSRT actions or interventions.

The following section provides a sampling of specific wait times data, findings and trends. Detailed wait times data for the CSRT Project are set out in Appendix D.

"I think the benefit from a clinical perspective is that it does expedite patient care...I think the main competencies that are definitely achievable would be in the area of planning and treatment delivery and in the areas of increasing efficiency of patient throughput and increasing the timeliness of patients being simulated and treated."
[Direct Supervisor, OCC]

A. Care Path Wait Time Reduction

The Palliative Care CSRT, PMH, sought to expedite time from referral to treatment (RTT) to treatment by using technical expertise, assuming more clinical tasks and efficiency and thoroughness with ordering procedures for patients. The following wait time reductions were seen:

- decreased average time from RTT to start of treatment from 5.3 days to 2.6 days – **reducing the wait time by 49%**
- decreased wait from CT Simulator appointment (CTSim) to treatment from 93 hours to 55 hours – **reducing wait time by almost 68%**
- NOTE: The reductions achieved by the CSRT were greater than those achieved by physicians during the same period.

The Bone Metastases Clinic (BMC) CSRT, JCC, worked across the patient care pathway, identifying enhancements from referral through to treatment. When comparing the journey for patients with bone metastases in the BMC to those who received care outside the BMC, the CSRT was able to:

- improve the time from consult to treatment from 2.8 days outside the BMC to 1.7 days within the BMC – **a 39% improvement**
- reduce the total time from referral to treatment from 9.6 days outside BMC to 6.5 days within BMC – **a 32% improvement**

A. Care Path Wait Time Reduction - continued

The Target Visualization and Delineation CSRT, Head and Neck Group, PMH, assumed primary responsibility for conducting image fusion and contouring organs at risk for patients being planned for Intensity Modulated Radiation Therapy (“IMRT”) and was able to:

- reduce time from CTSim to treatment from a median of 17 days to 15 days in 2008, and further to 13 days in 2009
- reduce time from decision to treat (DTT) to CTSim by 16%, from 6 days to 5 days.

The Skin Cancer CSRT, OCC, identified inefficiencies in the referral process and designed a new triage process incorporating appropriate wait time targets for each of three “priority levels” from referral and initial consult. The CSRT was able to:

- increase the percentage of patients seen within the target for their priority level from 37% to 60% - **an increase of 62%**.

The Palliative CSRT, OHRCC, made improvements to the process for “urgent” palliative patients entering the system and moving through the patient care pathway. When comparing patients whose care was managed by someone other than the CSRT and those patients cared for by the CSRT, the CSRT was able to:

- reduce the number of days to treatment from 8 days for those not managed by CSRT to 5 days for those managed by the CSRT
- increase the number of urgent patients seen within the target from 57% to 75%

B. Improved Patient Throughput

The Breast Cancer CSRT, PMH, who conducted “on treatment” reviews for patients receiving external beam radiation therapy, was able to:

- increase the total number of patients from 262 to 325 for equivalent periods of time – an increase of 2 patients per review clinic – **a 25% increase**

The Palliative Care CSRT with the Rapid Response Radiotherapy Program, OCC, developed a multi-faceted initiative to reduce inappropriate referrals in order to improve resource utilization

- reducing inappropriate referrals from 13.7% to 3% - **a 10.7% reduction in inappropriate referrals**

The Palliative Care CSRT, PMH, attended clinical mark-up procedures reducing the need for the attending physician to be present for these procedures, allowing the physician to attend to more complex patients and/or other oncology related duties. Specifically:

- increased the number of patients seen for treatment within two days or less following their referral for treatment from 53.3% to 66.7% - **an increase of 13.3%** compared to oncologist who achieved a 2.5% increase during the same period of time
- increased the number of patients who were seen for treatment within one day or less after their referral to treatment from 33.3% to 45.8% - **an increase of 12.5%** (compared to oncologist who achieved a decrease of 3.2% during the same period of time)

The Palliative CSRT, OHRCC, by adding a CSRT to the Rap[id Palliative Radiation Therapy Program – who conducted patient histories and assessments, obtained informed consent and triaged referrals according to priority levels, the CSRT was able to

- reduce the consult to planning time from 55 to 43 minutes - **a 22% reduction** which could allow for more patients to be booked in each clinic

The wait times data show concrete, measurable and significant reductions in wait times across the care pathway. The data is bolstered by results of interviews, in which various stakeholders confirmed the contribution of CSRTs to reducing wait times by different means, in a variety of clinical settings. It is notable that all CSRTs were able to achieve wait time reductions. This appears to be the result of CSRTs identifying and addressing key issues or gaps that contributed to treatment delays.

The data demonstrated that CSRTs reduced care path wait time, improved patient throughput, and created time and cost efficiencies for other health professionals as a result of their actions, interventions and program innovations.

C. Time Efficiencies for Health Care Professionals and Teams

The Target Visualization and Delineation CSRT, Head and Neck Group, PMH, assumed major responsibility within the interprofessional team for contouring organs at risk for patients being planned for Intensity Modulated Radiation Therapy (“IMRT”).

- On average oncologists estimated a time savings of 41 minutes per case, and a mean image fusion time-saving of 14 minutes, resulting in **a total time-savings of 55 minutes per patient** for the oncologists.
- The number of new patients seen by radiation oncologists in the program **increased from 90 in 2006 to 110 in 2008**.
- If a CSRT assumed contouring duties for 110 cases per year, the total estimated time savings for oncologists would be **approximately 100 hours per year**.

The Skin Cancer CSRT, OCC, who assumes responsibility for several activities in a busy multidisciplinary skin cancer new patient clinic, is able to find the following efficiencies:

- by conducting 100 clinical mark ups (CMUs) in one year for patients receiving radiation therapy saves the radiation oncologist (RO) 25 hours per year for additional new or more complex patients (15 minutes per CMU)
- seeing patient set ups on their first day of treatment takes 10 minutes per patient. With 4 to 6 patients starting treatment weekly, having the CSRT see these set ups saves the RO one hour per week, 52 hours per year

Benefits and Strategic Alignment

The results of this evaluation demonstrate that CSRTs significantly reduced wait times, one of the Ministry’s key priorities, in targeted areas across all phases of the Project. CSRT involvement in patients’ care demonstrably reduced the time required for patients to move from referral to consult to treatment to discharge. The evaluation results related to wait times demonstrates the benefits of CSRT across the care pathway.

The reduction in wait times achieved through implementation of the CSRT role is consistent with one of the Ministry's key goals, and with the Ontario Cancer Plan's goals of: (1) ensuring timely access to high-quality cancer care; and (2) improving the patient experience along every step of the cancer journey.

The results are also firmly aligned with and support the stated purpose of individual cancer centres and programs. For example, the results in two of the Palliative Programs (OCC and PMH), are consistent with the Ontario Cancer Plan's focus on palliative and end-of-life-care, as well as the individual goals of these radiotherapy programs.

The Rapid Response Radiotherapy Program at the Odette Cancer Centre received a **Cancer Care Ontario Quality and Innovation Award in 2008¹** for its efforts to reduce the length of time that this very ill population of patients waits for urgent care and pain relief.

3.4.2 Access to care

During the CSRT Demonstration Project, CSRTs undertook a number of activities that enhanced access to care in the programs or services under examination. The CSRTs enhanced access to care by developing the competence to share, over time and with appropriate education and training, specific tasks traditionally undertaken by radiation oncologists (through delegation of activities from the Oncologists to the CSRTs), and by implementing service or process enhancements in response to identified inefficiencies in the current system.

(a) Redistribution of work through delegation

Delegation of various clinical and non-clinical acts or tasks to persons other than physicians is commonplace. Appropriate delegation can enhance patient care and help use health care resources more effectively. Delegation of medical acts is an evolutionary process that can have significant implications for the practice of medicine, other health care professions and for the broader health care system, especially as the system moves towards a more interprofessional practice model. In recent years, as has been well documented, there have been significant changes in the nature or types of acts that are delegated by physicians to other health care professionals as deemed appropriate based on demonstration of competence.

The introduction of the CSRT role to Ontario's cancer system provided opportunities to explore delegation of an increasing number of activities in an effort to create a more flexible, fluid and responsive cancer system. Fluidity is enhanced by having more than one professional available to perform certain duties. This moves the model of care closer to realizing the vision of "right care at

"...when I have questions, I know who to turn to for advice. [The CSRT has] more experience in treatment planning and practical aspects so I could... easily ask for input."
[Radiation Oncologist, PMH]

the right time in the right setting from the right provider”⁶ that is promoted by the Ontario Health Quality Council, the Institute of Medicine⁷ and other organizations interested in quality improvement in health care.

A large number of specific activities were delegated to CSRTs during the course of the Project. These included:

- Communicating pathology results (in person or via telephone)
- Obtaining consent for treatment
- Conducting targeted patient assessment and history
- Booking and prescription entry privileges similar to senior residents and clinical fellows
- Performing target delineation and field placement
- Engaging in telephone triage, and providing follow up care via telephone consultation
- Performing field placement and dose prescription

As part of the evaluation, the CSRT Demonstration Project Team sought feedback from the CSRTs’ direct supervisors (the Oncologists) regarding delegation of activities to the CSRTs.

Interviews with Direct Supervisors - Delegation

Information and data from interviews with direct supervisors indicate that **all direct supervisors believe that the delegation of acts to the CSRT – once adequately educated – is appropriate.** Most envision a further expansion of the opportunities for the CSRT role based on their current experience. Examples of additional delegated activities identified in the interviews included discharge management, outreach and dealing with underserved populations.

In order for CSRTs to assume activities traditionally performed by Radiation Oncologists or any other health care provider, it is necessary to demonstrate that CSRTs can safely and appropriately perform the activities to be delegated. The methods used to document a CSRT’s ability to perform a particular activity up to acceptable standards were the collection of:

- i) concordance data; and
- ii) competence assessment

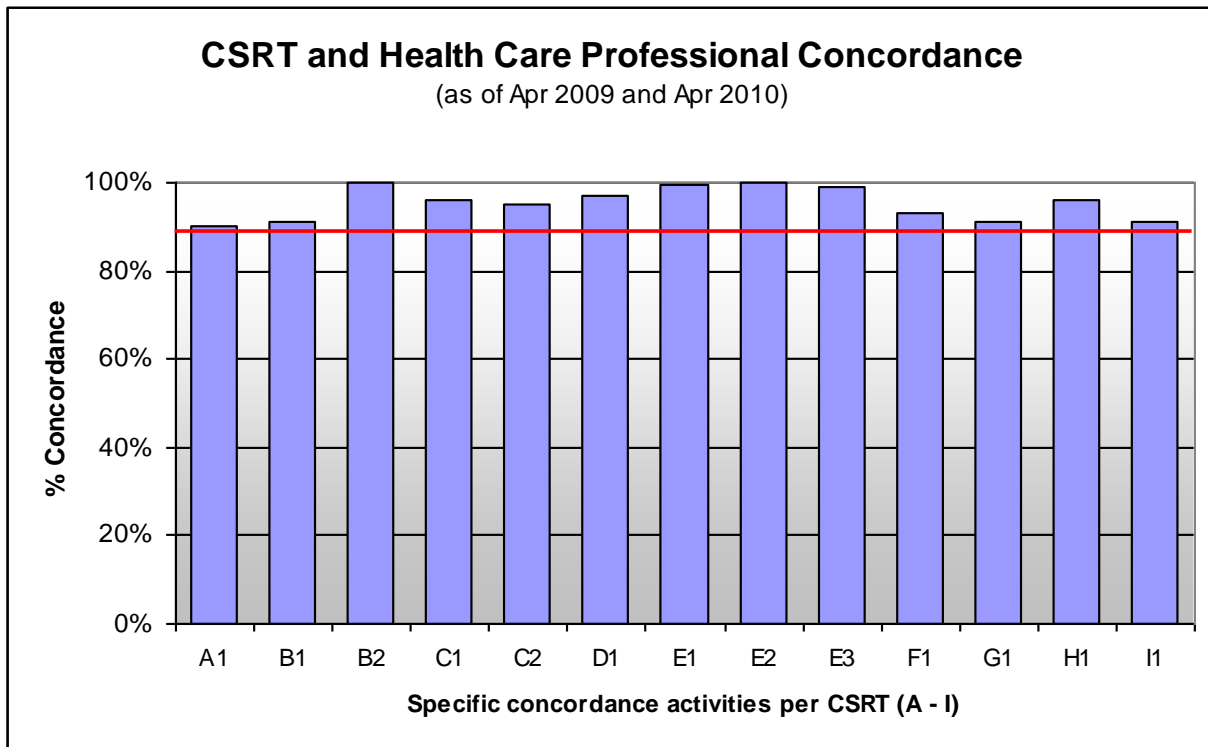
⁶ See, for example, ICES, The Ontario Health Quality Council’s *2009 Report on Ontario’s Health Care System*, p 7.

⁷ Institute of Medicine, *Crossing the Quality Chiasm: A New Health System for the 21st Century*. Washington, D.C.: National Academies Press, 2001.

(i) Concordance Data

Following implementation of the CSRT positions, the CSRTs collected and examined concordance data in order to determine levels of CSRT competence regarding the performance of specific clinical tasks. For purposes of the CSRT Demonstration Project, concordance was defined as *“the degree to which different people undertaking an activity agree on that activity.”*

The concordance data obtained during the Project reflects the degree to which the CSRT’s performance agrees with that of the Oncologist on a variety of position-specific services. The level of agreement (or concordance) between the CSRT and the Radiation Oncologist (or other health care provider) was used as an indicator of the CSRT’s competence to perform the tasks. The concordance data demonstrate that appropriately prepared CSRTs are able to competently perform activities traditionally completed by Radiation Oncologists. The graph and call out box below give an overview of the levels of concordance achieved and a sample of the types of activities assessed. Detailed concordance activities and data are set out in Appendix E.



Concordance Results:

The data showed extremely high levels of concordance between the CSRTs and Oncologists, meaning the Oncologists agreed with the CSRTs' clinical decisions in the vast majority of cases. Concordance data was obtained for multiple activities across CSRT roles.

Examples of activities that were evaluated using concordance studies and specific results are:

- **100% concordance** for prescribing dose for palliative patients by the Palliative CSRT at the JCC – of note is that the oncologist changed prescription on recommendation from the CSRT on three occasions.
- **96% concordance** for the delineation of the “seroma” (surgical bed) in breast cancer patients who were being planned for radiation therapy
- **92% concordance** for radiation treatment planning – placement of field and contouring for gross tumor volume and clinical tumor volume – based on 49 fields for 36 patients by the Palliative CSRT at CCSEO
- **91% concordance** was achieved for image registration and fusion for contouring and planning performed by the Target Visualization and Delineation (TV&D) CSRT at PMH
- **90% concordance** for field placement on 93 patients by the BMC CSRT at JCC

(ii) Competence

CSRTs track their achievement of competence using the evaluation form based on the draft CSRT competency profile (see Appendix B). Competencies refer to the specific knowledge, skills, judgment and attributes required to practice safely, appropriately and ethically. Briefly, the key competencies for CSRTs fall into the following three domains:

Clinical:

Working as a member of the specific interdisciplinary care team to provide optimal care for patients in a defined patient population or as delegated by another health care professional (e.g., formulate, implement and assess effectiveness of patient care plan and communicate the results of specific tests/procedures for the defined patient population).

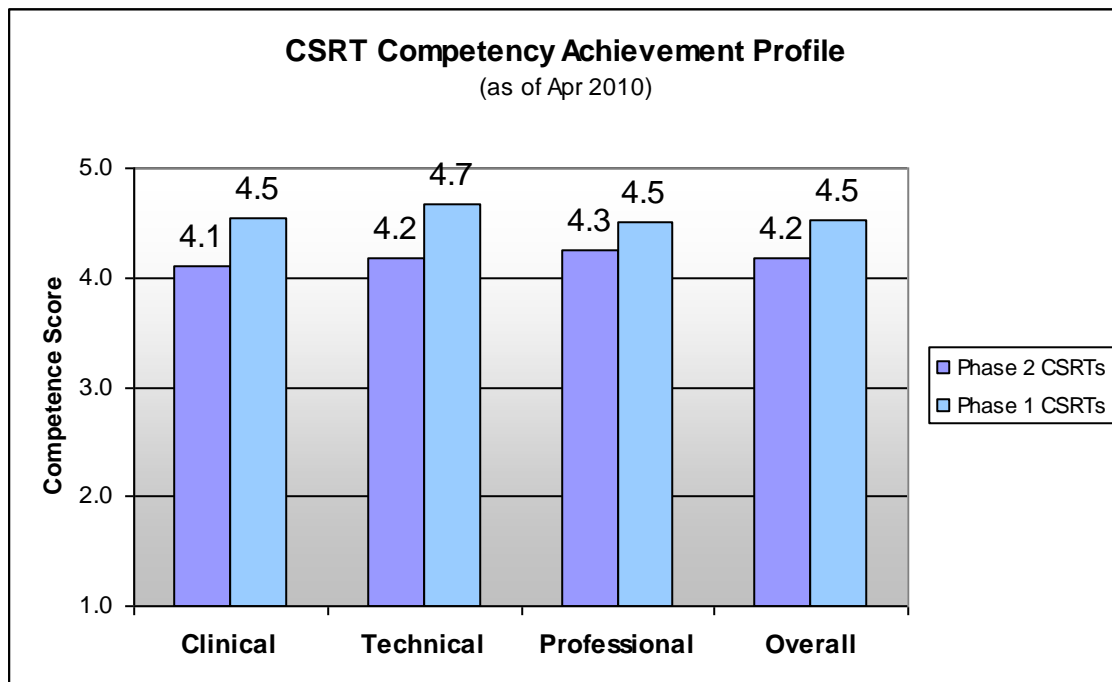
Technical:

Utilizing advanced technical knowledge to function as an expert in specialized program for patients in a defined patient population/disease site, or as delegated by another health care professional (e.g., order the appropriate imaging/planning procedures for optimal visualization of the regions of interest, where applicable).

Professional:

Functioning as a leader, role model, educator, researcher and mentor in all aspects of radiation therapy practice, especially in the CSRT's area of specialization (e.g., participate in the development of the radiation medicine and overall health service evidence-based knowledge by conducting research and participating in overall program review and external program/service audit).

Direct supervisors rated the CSRTs using an evaluation form based on the competency profile. Direct supervisors were asked to rate each CSRT on a scale of 1 (unacceptable) to 5 (outstanding) with respect to their achievement on each of the clinical, professional and technical competencies. Results emphasized the ability of the CSRTs to integrate into their environments and provide services at an advanced level in a relatively short period of time. As expected, scores in the “technical” domain received the highest scores. The graph below summarizes the competency scores. A table with details of the scores can be found in Appendix F.



In addition, qualitative data were collected as direct supervisors were asked to comment on CSRT competence during the telephone interviews. Thematic analysis of interview transcripts indicate that all direct supervisors agreed that the CSRT role included advanced duties and that the individuals in the positions were able to conduct their work at a high level.

(b) Program Innovation and Service Improvement

Improved access to care was also facilitated within programs through service innovations and improvements the CSRTs were able to identify and act upon. These included the addition of new services to the existing suite of services for patients already in the system, or improved access to existing services for previously underserved populations by capitalizing on the CSRTs’ unique knowledge and skill sets.

As part of the CSRT Demonstration Project, the Project Team identified and assessed the types of service improvements that were initiated by the CSRTs and how they have impacted the cancer care system. CSRTs enhanced services by implementing innovative programs, developing new processes, and assuming new roles. Specific initiatives included:

*The Palliative CSRT at OCC was awarded the **2010 Schulich Award**. The Seymour Schulich Award of the Sunnybrook Health Sciences Centre recognizes and celebrates the exceptional staff and students at Sunnybrook who continually go above and beyond their usual role to exemplify our values.*

- *Streamlining education and evaluation activities:*
 - developing a standardized curriculum for senior oncology residents
 - sharing teaching responsibilities from the Radiation Oncologist (freeing the Oncologist to perform other tasks)
- *Improving processes for accessing and moving through the system:*
 - developing a new process to classify and/or triage referrals
 - streamlining access to physical and human resources
- *Adding new activities or services to improve clinical care:*
 - developing formal processes for quality assurance rounds
 - facilitating an online patient discussion group for geographically remote patients
 - developing new materials for aboriginal communities and patients
- *Disseminating knowledge about programs and services:*
 - Internal and external educational sessions, peer-reviewed poster and podium presentations, guest speaker invitations, etc. to maximize stakeholder knowledge about CSRT work

“... [the physician] doesn't have to worry about anything. You can go in and do your work and then the CSRT is there and she takes over [Radiation Oncologist, Ottawa]”

*Work submitted by the Breast CSRT at PMH was the recipient of 2 awards at the 2010 Canadian Association of Medical Radiation Technologists Annual General Conference: **The George Reason Memorial Award** for the most outstanding technical or scientific exhibit and **the Philips Award** for the best teaching aid or basic principle exhibit.*

Program Innovation – comments from Direct Supervisors

In interviews, direct supervisors indicated that CSRT-led service enhancement initiatives provided multiple benefits, including:

- reduced wait times to enter or traverse the system
- increased the number of cases reviewed per week as part of the departmental quality assurance program
- shared some teaching and evaluation duties for students/residents with the radiation oncologist, freeing the physician to perform other tasks
- decreased “in-hospital” time for palliative patients

The CSRTs’ direct supervisors commented extremely favourably on the impact that the CSRTs have made in their programs/clinics. Notable impacts identified by supervisors include:

- making processes more efficient
- allowing radiation oncologist to see extra patients when CSRT is present
- enhancing professionally supported self-care and management
- Increasing patient satisfaction

A list of specific service enhancement activities and their results/benefits are summarized in table form in Appendix G.

Benefits and Strategic Alignment

Delegation of clinical and non-clinical tasks from physicians to CSRTs releases the physicians from this work, leaving them additional time to focus on other more complex activities or care for less well patients. This builds capacity and creates opportunities to improve access to care. This outcome is consistent with key goals in the Ontario Cancer Plan, including ensuring access to timely, high-quality care. The flexibility offered by the enhanced ability to delegate additional tasks to CSRTs is one of the key benefits associated with interprofessional teams. The increased overlap of professional skills allows the system to be more fluid and respond more quickly to changes in system pressures by allowing flexible distribution of work. The move to flexible and responsive interprofessional teams that maximize skill sets and intellectual capital is also consistent with commitments set out in the Ontario Cancer Plan and HealthForceOntario Strategy.

3.4.3 Stakeholder Outcomes

(a) Patient Outcomes

While the CSRT Demonstration Project had multiple goals and objectives, improved patient outcomes are particularly important. While evaluation of longer term clinical outcomes is

beyond the scope of this Project, patient satisfaction is among the Project's critical success measures.

The study used to measure patient satisfaction during the CSRT Demonstration Project was a modified version of the "Patient Satisfaction Questionnaire" which was originally designed and validated by the Rheumatism Research Unit at the University of Leeds.⁸ The Project modified the questionnaire to create a more generic version suitable for use in all of the participating cancer clinics.⁹ The study design was to compare the satisfaction rates of two patient groups as follows:

- patients seen in the respective clinics before the implementation of the CSRT position OR patients who had no interaction with the CSRT during their visit to the clinic ("pre-CSRT" data);
- patients who were cared for by the CSRT during their clinic visit ("post-CSRT" data).

Measuring patient satisfaction proved to be one of the more challenging aspects of the CSRT evaluation. Challenges, identified in Phase I, related primarily to:

- the length of the initial questionnaire;
- difficulties in patient recruitment and participation;
- challenges related to the nature of the CSRTs' patient interactions (i.e., limited amounts of time; number of providers and activities occurring as part of patients' care, etc.); and
- challenges related to the respective patient populations (e.g. palliative patients are less likely to feel well enough to complete a survey).

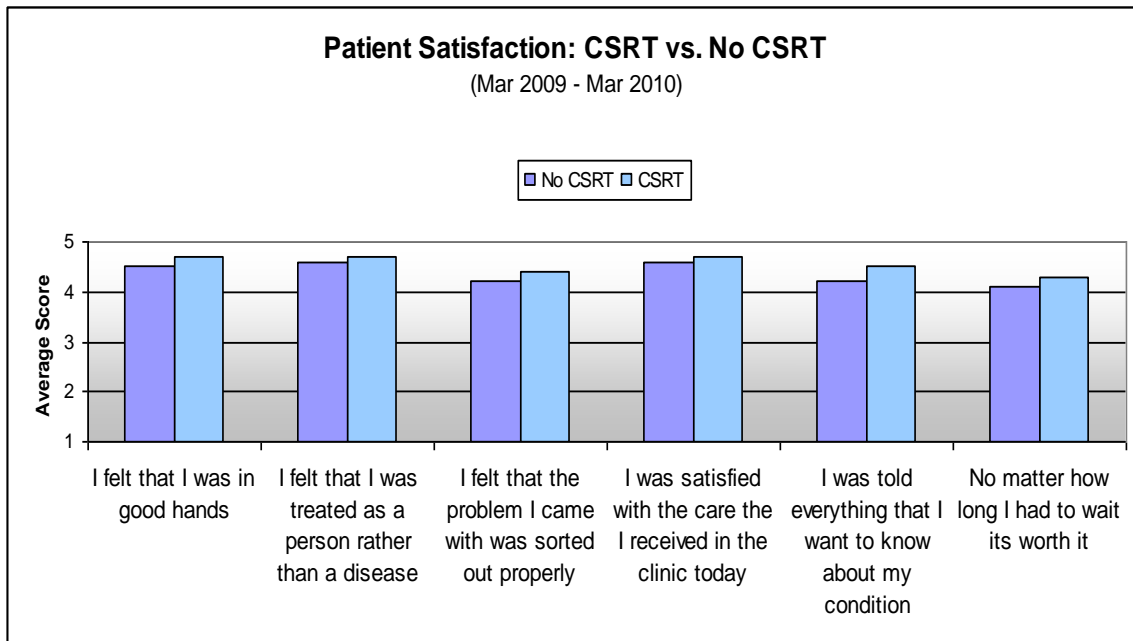
These findings are consistent with the literature on this topic which notes challenges in the area of obtaining patient feedback using a questionnaire format.

Given the difficulties identified during Phase I, an abbreviated version of the form was made available to palliative patients during Phase I Extension. The survey was also made available in a telephone format if the patient consented. Unfortunately, these changes did not result in an improved patient recruitment rate.

In the final phase of the project, funding was approved to hire research assistants who approached identified patients to consent to completing the form or to offer assistance with completing the survey. This strategy proved to be moderately successful and patient satisfaction surveys results were collected (pre-CSRT n = 55, post-CSRT n = 90). A summary of these results is represented in the graph below.

⁸ Hill, 1997.

⁹ Mortimer Market Centre: Service User Satisfaction Survey; Miles et. al. 2003.



Although there were no statistical differences in patient satisfaction between those who saw a CSRT and those who did not, the involvement of a CSRT within the patient’s care path was associated with a slight increase in patient satisfaction across all survey questions. More patients “strongly agreed” versus “agreed” that they felt they were told everything about their condition that they needed and that the problem at hand was sorted out properly. These positive indications were also reflected in patients indicating that they had an “excellent” experience with the CSRT and strongly agreed that the CSRT role was valuable to the patient’s understanding of treatment as well as a valuable component of the health care team.

Patient comments

“I also had the added benefit of understanding my treatment in greater detail, what to expect in terms of side effects and also the follow up I will receive in the coming weeks after my treatment is complete. Feeling like a human patient rather than a 'rushed' number is comforting and important. I would hope that this would be a standard for future cancer patients.”

“After everything was completed and before I left for home the CSRT gave me her card and phone number, and assured me I could contact them with any questions. It was an awesome experience. I wasn’t made to feel all alone without an outreach if necessary. Thank you so

Complete patient satisfaction data is set out in table form in Appendix H.

(b) Team Acceptance

Team acceptance of the CSRTs was measured using a variety of methods, including

- (i) Radiation Therapist Job Satisfaction Survey
- (ii) Interviews with direct supervisors of CSRTs
- (iii) Survey of front line and second line stakeholder job satisfaction
- (iv) Broader stakeholder consultation

(i) Radiation therapist job satisfaction

The Radiation Therapist Job Satisfaction Survey is a quantitative and qualitative questionnaire that was disseminated to radiation therapists in the departments where a CSRT was introduced. The survey was administered at two time points in each phase – before the implementation of the CSRT and following CSRT integration into the team – and reflects the therapists current understanding of the CSRT role and its place in the Ontario cancer care system. Three additional questions were added to the Phase I survey to gather additional information, and one question was altered for clarity based on feedback from the previous year. Radiation therapist satisfaction survey results are summarized in Appendix I.

Overall, data show that radiation therapists have high levels of job satisfaction (mean = 3.3/4, n = 199). The possibility of implementing a CSRT role in the future did not alter the high level of job satisfaction reported in earlier surveys. The survey results indicate that the addition of the CSRT position as a possible career opportunity will address, to varying degrees, the three key issues impacting on job satisfaction: (1) lack of career opportunities; (2) low wages; and (3) opportunities to specialize. Finally, results showed that radiation therapists did not have patient safety concerns associated with the implementation of the CSRT role. Qualitative data obtained from the survey showed that in general, radiation therapists agreed that CSRTs are a valuable addition to the clinical team.

(ii) Direct Supervisors

Interviews were conducted with the Phase I CSRTs' direct supervisors from February to March 2009 and Phase II CSRTs' direct supervisors in January to February 2010. In total, 11 radiation oncologists, one physicist, one PhD survivorship researcher and one departmental manager were interviewed. There was consensus about the ability of the CSRT role to positively impact on the supervisors' personal satisfaction, as well as the satisfaction of other team members associated with the CSRT. Through thematic analysis of the interview scripts, it was found that

"I personally think that my clinic runs a lot more efficiently and is a little less stressful when [the CSRT] is in clinic. . . I also solicited colleagues who have interacted with [the CSRT] and I've had overwhelming positive feedback from them as well."

[Radiation Oncologist, PMH]

supervisors highlighted a number of areas of satisfaction with the CSRT roles, including:

- CSRTs' ability to improve clinic flow
- CSRTs allow physicians to focus on other, more complex areas of their job
- CSRTs increase collaboration and build a more cohesive team (e.g., through improved communication, process directives, facilitation, etc.).

Direct supervisors identified some challenges associated with the CSRT role. These challenges fall in two primary areas:

- **Knowledge and skills acquisition:** Due to the project model, CSRTs did not arrive in the positions with the complete set of competencies required to fully realize the scope of practice of the positions. While direct supervisors ultimately recognized the value and contribution of the CSRT role, they identified challenges in the initial project phases. Recommendations from direct supervisors included more formal and consistent education, as well as recognition that each CSRT position requires some specialized domain-specific knowledge and skills. Formal, standard educational programs need to address both of these issues.
- **Scope of the CSRT role:** While direct supervisors recognized that the CSRTs have a wide range of skills and abilities that could impact positively on many aspects of the current system, they emphasized the importance of articulating, managing and containing the scope of each position. Some supervisors suggested that it would be better for the CSRT to do a few things really well, rather than diluting efforts over a broader range of activities, with less success. This could be due to the fact that the pilot project CSRTs were acquiring a number of new competencies “on the job” instead of coming to the program with these in place. Supervisors also pointed to the need for balance between clinical/patient-related activities and technical requirements of the positions.

(iii) Front-line and Second-line Stakeholders

The frontline stakeholder group is composed of key team members most directly affected by the CSRT's activities and most involved in the CSRT's work. In the hospital setting, frontline stakeholders include physicians, medical physicists and nurses working with the CSRT, and the CSRT manager. Second-line stakeholders are those who are one step removed from the CSRT direct team who may or may not be impacted by the work of the CSRT. This includes booking clerks, other radiation therapists, supervisors in other programs, etc. In order to assess any impact on these groups, the following validated and published questionnaires were used, in a pre-CSRT/post-CSRT design to assess impact of CSRT implementation on stakeholders:

- Quality of Work Life: *Minnesota Satisfaction Questionnaire Short-Form* (MSQ; Weiss et al., 1977)
- Burnout: *Maslach's Burnout Inventory* (Maslach et al., 1996)
- Intrinsic Clinical Satisfaction: Specific clinic-related questions from the *Physician Worklife Survey* (Thomas et al., 1999)

Stakeholder satisfaction was assessed both before and after the CSRTs were implemented in each phase of the project.

This part of the study also involved use of a qualitative questionnaire directed at assessing the satisfaction level of all stakeholders directly involved with the CSRT's work, and identifying how stakeholders perceive the CSRT position after the CSRT had been active in the position for a period of time.

Analysis of these metrics showed that the **CSRTs had no significant impact on any of the indicators selected related to quality of work life, burnout or job satisfaction.** As such, further post-CSRT assessments in Phase IE2 for the Phase I CSRTs were dropped. Phase II CSRTs conducted both pre-CSRT and post-CSRT surveys in this final year. These data, once again, show that CSRTs do not impact on these aspects of the team members work life.

Detailed results can be found in Appendix K.

(iv) Broader Stakeholder Consultation

In order to attain a more thorough and broad-based understanding of the stakeholder issues that remain related to widespread CSRT implementation, the Project Oversight Committee hosted a one-day symposium. The goal of the symposium was to explore the challenges to be faced by the various stakeholder groups in moving forward with CSRT adoption and implementation, and to work together to establish suitable strategies to address these challenges.

Representatives from the following stakeholder groups were in attendance:

- Cancer Care Ontario
- Canadian Partnership Against Cancer (CPAC)
- Canadian Association of Medical Radiation Technologists (CAMRT)
- Canadian Association of Radiation Oncologists (CARO)
- College of Medical Radiation Technologists of Ontario (CMRTO)
- Alberta College of Medical Diagnostic and Therapeutic Technologists
- Nova Scotia Association of Medical Radiation Technologists (NSAMRT)
- Ontario Association of Medical Radiation Technologists (OAMRT)
- University of Toronto, Department of Radiation Oncology
- Each of the provincial cancer centres with pilot positions in place
- Phase I and Phase II CSRTs
- Project Oversight Committee members

Many of the concepts and issues raised throughout the Project were identified during the symposium discussions. The most common themes are highlighted below, with a more thorough list located in Appendix L:

CSRT Demonstration Project Think Tank
Major Common Themes

Ongoing Challenges

- role clarity, consistency and acceptance
- sustainable funding
- professional territorialism
- established education and training

Strategies for Success

- establishing champions and advocates
- communication, including publications and presentations
- support and mentorship networks
- consistency and standard setting, clear expectations and outcomes

A detailed summary of the workshop is provided in Appendix L.

Benefits and Strategic Alignment

Evaluation results indicate that the CSRT role increases patient satisfaction, that the role is highly accepted by the interprofessional health care team, and that the CSRT role has a positive influence on Radiation Therapist job satisfaction. Improving patient satisfaction and achieving team acceptance of the CSRT role were key Project goals.

The increased patient satisfaction demonstrated during the Project as the result of the CSRT role is consistent with the Ontario Cancer Plan's goal of improving the patient experience along every step of the cancer journey. The team acceptance and radiation therapist satisfaction results are in line with commitments set out in the Ontario Cancer Plan and the HealthForceOntario strategy regarding innovative new health care roles and interprofessional teams.

3.4.4 Patient Safety

No incident reports were filed that related to CSRT activities during the entire period of the CSRT Demonstration Project. The absence of incident reports is bolstered by data and interview results which indicate that CSRTs perform their duties safely and appropriately.

3.4.5 Education and training

Individualized education and training programs were supervised and delivered by each of the direct supervisors, based on the specific needs of each CSRT and the proposed job description. Information collected from the direct supervisors – through the completion of the competency assessment forms and via individual interviews – indicated that appropriate educational preparation of the CSRTs is an identified challenge. In the smaller centres, in particular, the

All information indicates that a graduate level education, with substantial content similar to that for junior radiation oncology residents, is necessary to prepare radiation therapists for successful advanced radiation therapy practice.

resources and expertise required to provide the necessary level of education puts a significant strain on the department and therefore impedes the ability of the CSRT to traverse the learning curve in reasonable time frames. The data indicate that successful education requires a standardized approach to academic preparation and skills development and an appropriate balance between the broad-based education required for the CSRT role, and the specific competencies related to the CSRTs' areas of specialization.

All information indicates that a graduate level education, with substantial content similar to that for junior radiation oncology residents, is necessary to prepare radiation therapists for advanced radiation therapy practice. This includes content to broaden knowledge (leadership, professional communication and responsibilities, health care policy, etc.), content to deepen understanding of foundational radiation medicine concepts (advanced medical physics, clinical decision making content), and the opportunity to develop skills in a specialized domain of radiotherapy practice. While the evaluation results indicated that a graduate degree is required for CSRTs, it is clear that educational credentials alone are not sufficient; relevant clinical experience is essential to developing the required CSRT competencies. The need for these essential components was echoed in the feedback from project stakeholders during recent consultations (Appendix L).

Formalization of the CSRT role will require involvement from professional and regulatory bodies in terms of registration, certification and oversight. These bodies - the Canadian Association of Medical Radiation Technologists (CAMRT) and the College of Medical Radiation Technologists of Ontario (CMRTO) - will dictate the educational and other requirements for certification, and determine how competence will be demonstrated. Requirements will need to align with the competencies that define the CSRT role, and the educational preparation required to achieve this competence. It will be important to establish how the current CSRTs will fit into the new processes given the fact that their education was delivered individually on-site at their local institutions. Discussions are underway with both the CMRTO and the CAMRT to develop and implement necessary processes and systems to assess applicants for registration, and monitor professional competence for CSRTs.

3.5 Summary of Findings

Overall, the results from the final evaluation of the CSRT Demonstration Project show that the CSRT role has been successful in addressing and achieving its objectives. A summary of key findings is presented below.

Finding 1: CSRTs can be educated and trained to competently and safely undertake advanced practice involving specific activities traditionally performed by radiation oncologists, through delegation of activities or the creation of medical directives.

Finding 2:	CSRTs can improve the efficiency of the system by improving patient wait-times across the patient care pathway, increasing patient throughput and facilitating time efficiencies for team members. These impacts combine to build system capacity in their specific programs.
Finding 3:	CSRTs can improve quality and effectiveness of existing systems and processes by streamlining activities, eliminating redundancies and developing innovative approaches to program activities and adding new services to those systems.
Finding 4:	Patients are highly satisfied with the care they received from CSRTs. Satisfaction with their care was rated as either equal to or higher than the care they received from the other team members.
Finding 5:	CSRTs have become valued members of the teams in which they work facilitating improved workflows and enhanced team functioning and cohesiveness.
Finding 6:	The CSRT competency profile allows for the development of diverse positions that align with specific local needs including improved effectiveness and efficiency and/or innovation and accelerated knowledge translation.
Finding 7:	Maximum success for CSRT integration is achieved when positions are developed to clearly address specific local needs in the radiotherapy care pathway and when they include specific and measurable outcomes.
Finding 8:	System wide implementation of advanced radiation therapy practice will be most successful through the establishment of formal and consistent graduate level educational requirements and formalized certification/registration processes.

3.6 Challenges and Lessons Learned

While the CSRT Demonstration Project involved some challenges, particularly in the initial phases, in general the Project proceeded without major issues. Timelines for each of the Project's phases were met, expenditures were consistent with forecasts, and the Project phases completed within budget. In addition to the relatively minor data collection issues discussed in the evaluation section, challenges were noted in the following areas.

In the first phase of the Project (the APRT Development Phase), the Project identified role definition, role confusion, professional scope of practice issues and territorialism as the key barriers or challenges to implementation. These issues were consistent with those seen in a wide body of research on advanced practice roles generally, and the Project Oversight Committee took steps to address these issues in subsequent phases of the Project. Issues of territorialism were addressed through enhanced communication and/or "time in" the roles. These experiences reinforced the need for early, regular and clear communications with CSRTs and stakeholders.

Insufficient needs assessments prior to implementation of some CSRT roles also contributed to a lack of clarity and confusion regarding roles and expectations. Early experience highlighted

the need for comprehensive needs assessments before roles are implemented. It also pointed to the need for a centralized standardized education program, given the difficulties with the onsite learning plan approach in some centres.

As documented earlier, the individualized educational programming undertaken by the incumbents proved challenging for both CSRTs and for direct supervisors. While defining educational needs was easy to do, it was difficult to ascertain how to be consistent from position to position – within and amongst centres. This was identified in the CSRTs' self-reflections, in the interviews with the direct supervisors and the consultation with the stakeholder group. Filling the educational needs proved more difficult in smaller centres, speaking to the need for more formal and centralized educational programming. It was evident that in certain situations, the lack of understanding around expectations for the incoming CSRT lead to some confusion with team members around expected functioning of the CSRT in their position.

The Project also demonstrated that the implementation of a new role like the CSRT must be done with a clear strategic and targeted vision of the role, clear indications of how success will be measured, as well as its development and implementation as an integrated entity within the team and program structure.

3.7 Outcomes and Successes

The evaluation indicates that the CSRT Demonstration Project attained the majority of its objectives. The Project successfully delivered on key goals, deliverables and commitments in all Project phases from defining and assessing the viability of the role, to evaluating the implementation of CSRT positions, through to assessing the transferability of the role to other settings. Summarizing, the CSRT Demonstration Project accomplished the following:

- **Phase I (including Phase I, Phase I Extension and Phase IE²)**
 - Assessed feasibility, viability and acceptance of the role
 - Developed a definition of advanced practice in radiation therapy
 - Developed a set of standard tools and processes to guide the implementation of successful CSRT positions
 - Established data collection and evaluation methodology
 - Measured outcomes and assess benefits, including impact on wait times, service enhancements, team acceptance and stakeholder satisfaction
 - Developed enduring materials for future system-wide implementation of the role
 - Creating a revised model of care incorporating the CSRT into the existing radiation therapy team fabric (in progress)
 - Conducted broader consultation with project stakeholders regarding opportunities and challenges for wide-spread CSRT implementation
 - Developed a sustainability plan

- **Phase II**

- Tested transferability to different settings, including traditionally hard to reach populations – e.g. Aboriginal communities
- Utilized the tools and processes developed in Phase I to assess their reliability and usability

The results of the final evaluation of the CSRT Demonstration Project show that the CSRT role has been successful in addressing and achieving its objectives. The CSRT has proven to be a viable and desirable addition to the radiation therapy team, contributing significantly to concrete and measurable program and service improvements while also contributing to the knowledge base of the radiation therapy profession as a whole. Key outcomes and successes are summarized below.

Decreased Wait Times

Wait times decreased in all of the programs where CSRT positions were implemented. The wait time reductions were achieved in the specific areas of the patient care pathway targeted by the CSRTs (e.g. from referral to consult, consult to ready to treat, etc.). The activities targeted in each CSRT position capitalized on the CSRT's advanced knowledge of clinical oncology and radiation biology and their technical expertise within the radiation treatment planning and delivery process. CSRTs achieved wait time reductions by developing and implementing service enhancement innovations and initiatives, and by assuming responsibility for activities that were traditionally in the purview of radiation oncologists. The addition of a CSRT helped members of the multi-disciplinary clinical team maximize the skill sets and intellectual capital of team members, and freed oncologists to focus on other activities.

Improved Access to Radiation Treatment

CSRTs improved access to treatment and quality of care at a variety of points across the patient journey by targeting areas that offered the greatest potential for process improvement. CSRTs improved access to radiation treatment in a number of ways, including reducing inappropriate referrals, improving efficiency and accuracy of the referral process, increasing the number of cases reviewed, reducing the gap or wait between initial consult and treatment, streamlining quality assurance and assessment of set up, developing triage systems for referrals and bookings and facilitating an online patient discussion group for geographically remote patients.

Team Acceptance of the CSRT role

Overall acceptance of the CSRT position is very high. Satisfaction surveys and telephone interviews demonstrate strong support for the CSRT role from direct supervisors and other members of the health care team. Acceptance improved over time. CSRTs are widely viewed as a valuable addition to the team. Primary benefits identified by stakeholders include the CSRTs' ability to relieve oncologists from specific duties, leaving them free to perform other tasks, as well as their contributions to process innovation and their ability to improve program flow and effectiveness.

Radiation Therapist Job Satisfaction

Radiation therapy job satisfaction is high. Responses to survey questions indicate that radiation therapists believe the addition of the CSRT position to the professional career ladder will help overcome the key issues that were identified as impacting on job satisfaction: (1) lack of career opportunities, (2) low wages for expert practitioners and; and (3) lack of opportunity for specialization in radiation medicine.

Increased Flexibility and Fluidity for the Interprofessional Team

The CSRT role is extremely flexible and adds much needed interprofessional fluidity and flexibility to radiation therapy programs. The flexible nature of the role allows programs to better deploy members of the interprofessional team in response to systemic pressures while maintaining or enhancing levels of service by enhancing the capability of the system to deliver the "...right care at the right time in the right setting..."¹⁰ Flexibility also comes from the ability to shift the focus of the CSRT's work between improving system efficiency and effectiveness and acceleration of innovation in the program or service.

Contribution to the science of radiation therapy

The work of the CSRTs in their pilot positions has generated knowledge and created innovative ways of practicing such that the disseminated results of this work are being recognized locally, institutionally, nationally and internationally. It is believed that this new breed of radiation therapist will contribute in significant ways to the advancement of radiation therapy practice here in Ontario and beyond.

¹⁰ ICES, The Ontario Health Quality Council's *2009 Report on Ontario's Health System*.

4.0 RECOMMENDATIONS FOR SUSTAINABILITY

4.1 Recommendation

After five years of assessing the viability and impact of the CSRT role on Ontario radiation therapy delivery program, Cancer Care Ontario (CCO) believes that the evidence supports full endorsement, formal recognition and system-wide implementation of this new, important health care provider role.

Cancer Care Ontario recommends that Ontario transition to an “implementation phase” that focuses on the full implementation and integration of the CSRT role in Ontario’s cancer system.

In order to fulfill this recommendation, CCO is putting forth a sustainability plan that identifies the remaining activities necessary to ensure consistent and standard development and deployment of CSRT positions as needed throughout the system. Several activities underlie a successful implementation including:

- Transitional funding for the CSRTs currently in practice allowing radiation treatment departments to assume financial responsibility incrementally over a period of time;
- A time-limited implementation support team to assist with province-wide roll-out and with ongoing knowledge dissemination;
- Training allowances to support new positions created prior to 2012 when the academically prepared CSRTs enter the workforce and when province-wide certification processes are available;
- Continuation of the groundbreaking work with the professional organizations and educational partners on a CSRT certification process and mechanisms to ensure maintenance of practice standards across the province (and beyond); and
- Continued work on the development of the radiotherapy “model of care” based on the CSRT experiences and project data.

4.1.1 Partners

In order to realize the full implementation of the new profession role, many partners will be required to envision suitable positions and appropriate deployment of CSRTs across the cancer care system. In addition, our professional partners will need to be engaged to assist with the establishment of standards for the position in order to ensure the quality of the individual CSRT positions against what has been established over the course of this project.

- Ministry of Health and Long-Term Care
- Cancer Care Ontario
- Regional Cancer Centres LHINs
- College of Medical Radiation Technologists of Ontario
- Canadian Association of Medical Radiation Technologists
- Ontario Association of Medical Radiation Technologists
- Canadian Partnership Against Cancer

4.2 The Sustainability Plan

Specifically, the recommendations for CSRT sustainability are as follows:

1. Continuation of existing positions

In the final year of the CSRT Demonstration Project, 10 CSRT positions were funded across Ontario – 5 senior positions (in place since March 2007) and 5 junior positions (since December 2008). During the project, CSRTs were actively engaged in their clinical duties, while also committing a significant portion of their time to meet project deliverables – data collection/analysis; report preparation; abstract preparation; etc. To fully implement these positions clinically, programs will be required to rework the role description for each CSRT to develop a final, full-fledged position – optimizing clinical contributions to the teams within which they are situated.

Clear outcomes will be articulated and measured, over time, to assess the success of the position. Annual reports utilizing standard metrics will be required for continued access to transitional funding. This transitional period will also be required to identify appropriate funding sources. Access to new funding sources will rest on the alignment of the goals and specific outcomes of the newly described positions – e.g. quality initiatives, capacity building, innovation and knowledge translation. As such, funding could come from operational monies, research funds or other sources.

In light of these realities, CCO recommends a three-year transition scheme that incrementally transfers fiscal responsibility for the final 9 positions from the Ministry to the individual cancer centres.

The recommended scheme proposes the following breakdown of funding contribution:

9 positions, funded by:

F 2010/11 – 60% MOHLTC, 40% local radiation treatment program

F 2011/12 – 40% MOHLTC, 60% local radiation treatment program

F 2012/13 – 20% MOHLTC, 80% local radiation treatment program

F 2013/14 – 100% local radiation treatment program

2. Establishment of a time-limited, implementation support team

Of paramount importance to the success of this project is the adherence to clear standards and processes as well as the alignment of any positions with the objectives and outcomes of the project as well as with strategic directions of Cancer Care Ontario. In order to nurture this new initiative during the critical initial years of transitioning to province-wide adoption, a small implementation support team would be established by CCO to provide expert consultation to the treatment centres as they implement the new role. Using the tools and metrics developed and adopted by the CSRT Demonstration Project, the team coordination and oversight will ensure accountability and consistency of implementation by providing assistance to centres for internal needs assessment, the translation of needs into measurable objectives for a new

position, the creation of the job description, preparation of the business case (including specific metrics to track success), selection of incumbents, design of on-site education and training program, and measurement of success.

This recommendation would be funded as follows:

F 2010/11 \$80,000 (Project Manager + administrative support, supplies, travel, etc.)

F 2011/12 \$81,200 (Project Manager + administrative support, supplies, travel, etc.)

F 2012/13 \$41,212 (Project Manager + administrative support, supplies, travel, etc.)

3. Transitional phase seed money

During the critical “roll out” phase of province-wide CSRT implementation, it is proposed that incentive, in the form of “seed money” be provided to centres who are willing to take the important steps to implementing a CSRT in response to local needs. This form of financial incentive is proposed for several reasons. Firstly, this “roll out” phase of CSRT implementation coincides with a small window of time where CSRTs will continue to have to be trained/educated on-site using individualized programs to meet specified learning needs. This method of education and training is resource intensive for the local sites, and as such, this financial contribution will provide system flexibility to allow them to create the most effective in-house program without compromise. It is expected that this situation will be alleviated in the coming years as the professional bodies explore and implement a certification process that will outline educational requirements and create a standard of practice for the CSRT role. Also, in 2011, the first graduates of the Master of Health Science in Medical Radiation Sciences – a professional master’s program designed to develop expert and academic clinicians in radiation therapy – will become available. By 2012, it is expected that these graduates will be able to align with expressed department needs and begin directly filling the CSRT positions being developed.

Given these concurrent developments, it is recommended that any new radiation treatment programs (e.g. those that have not been involved in the current pilot projects) implementing new CSRT positions during this window of time receive a training allowance of 50% salary for incumbents for the 12 months of the new positions. There are a total of 14 centres in Ontario, so **maximum** funding would be for 9 new positions.

Total cost “seed money” (50% salary support, 12 months, 9 positions) - \$435,870

This 12-month allowance will likely span 2 fiscal years to accommodate time for position development and recruitment. The *sample breakdown* below shows a 50/50 split between fiscal 2010/11 and 2011/12 but the breakdown may be different depending on timing:

F 2010/11 \$226,935 (6 months of 50% salary support)

F 2011/12 \$226,935 (6 months of 50% salary support)

Access to this funding would be hinged on ongoing compliance with established practice standards and methodologies developed in the CSRT Demonstration Project. Centres with new CSRT positions will be expected to report on the progress of the new CSRT and provide evidence of impact and standards of practice.

4. Establishment/maintenance of standards

Successful implementation of new professional roles in the health care system cannot be successful unless there is consistent, system-wide understanding of what the new professional role looks like. In order to achieve this, mechanisms for establishing standards of practice and a process for assessing them in eligible practitioners must be developed and implemented. This is a critical piece of the adoption of the new CSRT role in Ontario. To further this initiative, a partnership and workplan with both the Ontario and Canadian Association of Medical Radiation Technologists (OAMRT and CAMRT) – the provincial and national professional certification bodies respectively – must be formalized.

Work must be undertaken to create an effective method of assessing competence of CSRTs, and to create a “protected professional title” for advanced radiotherapy practitioners. A variety of activities must be undertaken to ensure a reliable and valid solution is created. These include, but are not limited to, literature review, validation surveys, convening expert panels, data analysis, item generation and validation, etc.

This work will become part of the mandate for the implementation team at CCO to ensure alignment with the principles of the CSRT Demonstration Project.

The funding required to meet this objective is as follows:

F 2010/11	\$30,000 to develop examination template, question bank and examination processes with professional association
F 2011/12	\$30,000 to continue development work and implement first iteration of the examination process
F 2012/13	\$10,000 for second iteration of certification process

During this transitional period, work will also continue with the College of Medical Radiation Technologists of Ontario (CMRTO) – the provincial regulatory college for radiation therapists – to monitor the requirement for a separate registration category for advanced practice radiation therapists. This has been discussed with the CMRTO and it has been agreed that there is no need – at this time – to undertake such an activity. However, issues related to CSRT scope of practice and ensuring public safety will continue to be tracked and acted upon by the CMRTO should it become necessary.

5. Models of Care

During Phase IE2, Project members, in conjunction with CCO’s Planning & Strategic Implementation Department, began building workflow processes for each stage in the radiation

therapy patient journey. Phase I and II CSRTs convened to map out processes in each of their centres and programs and worked to find commonalities and methods to capture variations across their respective locales. It is hoped that this work can continue. A provisional work plan includes: stakeholder review and finalization of workflow maps, compile relevant data and centre characteristics and development of model. The majority of the funding will be for the services of the experts required to conduct the remaining work – research analyst and healthcare engineer.

F 2010/11 \$30,000 (Research Analyst + Healthcare Engineer)

4.2.1 Sustainability Plan Budget

CSRT Demonstration Project Sustainability Plan Funding Request

1. Transition of current CSRT salaries				
	per year	# CSRTs	% MOHLTC	
F 10/11	\$100,860	9	0.60	\$544,644
F 11/12*	\$102,877*	9	0.40	\$307,358
F 12/13*	\$104,935*	9	0.20	\$188,883

2. Central CSRT Implementation Team				
<i>1. Project Management Personnel</i>				
F 10/11	\$120,000	0.50	1.00	\$60,000
F 11/12	\$122,400	0.50	1.00	\$61,200
F 12/13	\$124,848	0.25	1.00	\$31,212
<i>2. Administrative Costs (support, travel, phone, etc.)</i>				
F 10/11	\$20,000			\$20,000
F 11/12	\$20,000			\$20,000
F 12/13	\$10,000			\$10,000
3. New CSRTs Seed Funding				
F 10/11	\$100,860	9	0.25	\$226,935
F 11/12	\$100,860	9	0.25	\$226,935

4. Standard setting/maintenance systems				
F 10/11	\$30,000			\$30,000
F 11/12	\$30,000			\$30,000
F 12/13	\$10,000			\$10,000

5. Models of Care Research				
F 10/11	\$30,000			\$30,000

SUMMARY	Year 1 2010/11	Year 2 2011/12	Year 3 2012/13
Existing CSRTs	\$544,644	\$307,357	\$188,883
Project manager	\$60,000	\$61,200	\$31,212
Administrative costs	\$20,000	\$20,000	\$10,000
New CSRTs (50/50 split)	\$226,935	\$226,935	
Certification processes	\$30,000	\$30,000	\$10,000
Models of Care research	\$30,000		
	\$911,579	\$645,492	\$240,095

* Includes an estimated annual increase of 2% in the event that finalized positions fall into local collective bargaining units.

4.3 Conclusions

The CSRT Demonstration Project aimed to provide a platform for evidenced-based decision making relating to CSRTs. The evaluation indicates that the CSRT Demonstration Project attained the large majority of its objectives. Data and information obtained during each of the Project phases demonstrate that a number of benefits can be realized through implementation of the CSRT role, and confirm that the roles are both viable and highly supported by stakeholders. The summative findings confirm that CSRTs can safely and effectively provide some services that are traditionally performed by radiation oncologists, freeing the oncologists to provide other more complex services. Specific outcome effects are related primarily to reductions in patient wait times, improved access to services, development and implementation of process innovations - including improving service for previously underserved populations - increasing the flexibility and responsiveness of interprofessional teams and contribution to the overall knowledge base of radiation therapy.

The evaluation demonstrated that the addition of CSRT role offers many benefits to patients and patient care, confirmed that the CSRTs are valued and desired members of their multi-disciplinary health care teams, and established that the CSRT positions are having a positive impact on the programs and teams in which the CSRT role was implemented.