Purpose: Develop an evidence-based decision-support framework for optimizing the location of Radium 223 (Ra) treatment facilities based on different metrics of geographic access.

Methods and Materials: Residence at death and death date for all patients who died of prostate cancer in British Columbia between 2009 and 2014 were obtained from a prospectively maintained population-based registry. Patients who died of prostate cancer were considered potentially eligible for Ra treatment prior to death, assuming that they would go through a phase of symptoms from bone metastases. Forty-percent of patients in the province are known to receive palliative radiotherapy to bone prior to death from prostate cancer. Two metrics of geographic access were defined: average travel time to a treatment facility (ATT) and percentage of patients residing within 90 minutes travel to a treatment facility (C90). At the time of analysis, three nuclear medicine facilities were providing Ra (Vancouver, Victoria and Kelowna). All 22 other licensed nuclear medical facilities in the province were considered as feasible new locations for Ra treatment. Travel time from each patient’s residence to every facility was calculated using Microsoft MapPoint. An integer programming model was developed to identify facility locations that optimize ATT and C90. C90 was considered primary metric as ATT tends to overweight a small number of cases with very long travel times.

Results: 3194 patients met eligibility criteria. Several scenarios seeking to improve geographic access by choosing different locations for Ra treatment were run. The first group of scenarios considered the existing locations and tested the addition of new locations from the nuclear medical facilities. Prior to death, 67% of patients lived within 90 minutes of one of the three centres currently providing Ra. C90 increased to 75%, 79%, and 82% when one, two and three additional facilities were added. ATT decreased from 156 minutes to 89, 79 and 70 minutes respectively. The additional facilities (mid-Vancouver Island, Kamloops and eastern Fraser Valley successively) were in areas with medium-high population density and long distances to the existing Ra facilities. To reach a C90 of 90%, a total of seven additional facilities would have to be opened. A second group of scenarios assumed a “greenfield” setting with no pre-existing facilities. Resulting facility locations differed from the existing locations and improved C90 to 70%, 78%, 82% and 85% with three, four, five and six Ra treatment facilities.

Conclusions: Geographic access is one of the important factors to consider when deciding the location of treatment facilities. By measuring geographic access and determining optimal location of new facilities, the proposed framework provides a data-driven approach to quantitatively evaluate the configuration of a treatment delivery system. This framework can be expanded to include other clinical, operational and political considerations.

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IT’S CRUNCH TIME: FINDING EFFICIENCIES WITH A NEW, APRT-MEDIATED MODEL OF CARE

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Purpose: With increasing incidence and prevalence of cancer in Canada and beyond, the use of radiation therapy (RT) for both curative and palliative intents will continue to increase. Combined with the unprecedented pace of technological innovation and increasing complexity of care, the RT system must find new models of care to rethink the distribution of work and the skill sets required to do this work. In Ontario, the Clinical Specialist Radiation Therapy (CSRT) Project was created to ascertain if advanced practice radiation therapists (APRT) could add effectiveness and efficiency to the already burdened system in a value-added way. Since 2004, the project team has developed, implemented and evaluated the APRT role in a variety of clinical settings.

Methods and Materials: After a period of time allotted to allow the pilot APRTs to acquire and prove competence in activities specific to their particular positions, mixed methods were used to test the impact of redistributing workload between APRTs and radiation oncologists (RO) under the headings of: 1) Quantity - ability to increase capacity at point of entry to the system (direct) and within the care pathway (indirect); 2) Quality - improvement in provision of patient care or addition of new services to improve the patient experience and/or satisfaction; and 3) Innovation and Knowledge Translation - the volume of research and innovation activities that include or are being led by APRTs.

Results: In the 2014-2015 year, there were 24 CSRT “active” positions in place, with 21 of them being considered permanent full-time (CCO, 2015). Under the heading of Quantity, many positive direct and indirect impacts have been reported with the addition of CSRTs including: an increase in the number of new patients seen in consult (direct) and the number of RO hours saved (indirect). The reported number of additional patients seen was as high as 28 new patients per month (33% increase; average: 20%) and the reported number of RO hours saved were as high as 50 hours per month (average: 12.5 hours) which, at its maximum, represents a significant amount of ROs’ time allocated to clinical work and patient care (CCO, 2015).

Conclusions: The CSRT-driven model of care can provide significant added value to the existing RT system by adding capacity for an increased number of patients to enter the system and for ROs to focus on more complex activities in their scope. It is suggested that this model should be considered a viable option for managing the pressures of the changing landscape in RT in Canada.

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Abstract withdrawn