



Institut national d'excellence en santé et services sociaux

## **Feasibility and appropriateness of implementing satellite radiotherapy centres equipped with a single linear accelerator**

English summary

This is the English summary of the guidance entitled *Faisabilité et pertinence de déployer des centres satellites de radiothérapie munis d'un seul accélérateur linéaire* published in June 2016.

The complete version of this guidance (in French) is available on the website of INESSS in the *Publications* section.

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# SUMMARY

Cancer is responsible for 29 % of deaths in Canada, which makes it this country's leading cause of mortality. More than 50,000 new cases of cancer were diagnosed in Québec in 2015.

Radiotherapy is an important component of the therapeutic arsenal for cancer. It is estimated that radiotherapy is indicated in slightly more than 50 % of cancer patients at some point during their disease.

Radiotherapy clinics are usually set up in large urban centres. Cancer patients who live in remote areas therefore have to travel long distances from their home and family to be treated with radiotherapy. To improve access, the Direction générale de cancérologie (DGC) is examining the appropriateness and feasibility of implementing single-machine satellite radiotherapy centres in certain regions of Québec, specifically, Abitibi-Témiscamingue, the Côte-Nord and the Gaspésie/Îles-de-la-Madeleine. The purpose of this document is to provide relevant information for decision-making for such projects.

The documentation and information used are from peer-reviewed publications, expert group reports produced for governments of other countries, reports published by certain organizations operating in the field of radiotherapy, and interviews with representatives of single-machine satellite radiotherapy centres. In addition, contextual data was gleaned from Québec and Canadian government documents or gathered by consulting experts at clinical settings in Québec.

In Canada, it is estimated that radiotherapy is used about 12 to 15 % less in remote rural areas than in urban areas or areas near a radiotherapy centre. The exploratory analyses performed for the three regions of interest indicate that only Abitibi-Témiscamingue exhibits substantially less radiotherapy utilization than the province as a whole (relative difference: - 30 %). Radiotherapy utilization by patients in the Côte-Nord and the Gaspésie/Îles-de la-Madeleine is also lower than that for the province as a whole, but the difference is smaller (- 7.3 % and - 5.3 %, respectively). Large distances from a radiotherapy centre are associated with difficulties that can discourage patients from availing themselves of this therapy. According to the surveys consulted, these difficulties are associated primarily with travel, lodging, meals, isolation, less family support, financial concerns, and the inability to fulfill work and family responsibilities.

As shown by the experience of a few centres worldwide, implementing single-machine radiotherapy centres capable of providing safe, quality treatments is a feasible undertaking. However, this option entails certain difficulties that need to be overcome and certain precautions that need to be taken. The key condition for the success of a centre in a remote area is its affiliation with a hub centre (networking between the regional satellite centre and the hub).

The main issues specific to single-machine satellite radiotherapy centres reside in the difficulty ensuring personnel and equipment redundancy to permit the continuity of services. Indeed, because of the centres' remoteness, it can be more difficult to recruit and retain certain categories of professionals to practice exclusively at these facilities. Furthermore, it is not possible to achieve a critical mass of personnel on site to easily deal with absences (e.g., leaves, vacations and departures). Certain centres have addressed these problems by establishing mobility agreements with certain professionals at the hub centre whereby they ensure a regular presence at the satellite centre and an intermittent presence according to additional, ad hoc

needs. Telemedicine can also play a role by enabling patients to consult their physician from a distant location.

Since a single-machine radiotherapy centre cannot count on a second linear accelerator (linac) to prevent treatment interruptions in the event of a breakdown, it is essential to develop a contingency plan spelling out each party's responsibilities and the procedures to follow in order to deal with such an event. For example, the backup plan of one of Ontario's single-machine centres is to simply reorganize the schedule, to administer treatments on weekends or to transfer the patients to the hub centre, depending on the duration of the interruption. Choosing a linac of the same type as one of the hub centre's machines offers several advantages, such as being able to treat the transferred patients without having to redo the plans.

Presently, no published study indicates whether patients treated at a single-machine satellite centre achieve oncological outcomes (disease control, survival) similar to those achieved by patients treated at a hub centre. However, studies suggest that treatment quality at satellite centres is at least as good as that at hub centres. To ensure quality, expert groups recommend the creation of a quality assurance program similar to that at the hub centre, leadership from the hub in this area, and the planning of independent audits, in particular, soon after the service is set up. Telemedicine can also play a role in terms of quality by enabling professionals to share their clinical, technical and scientific expertise.

The success of a satellite radiotherapy centre also depends on several contextual elements, such as patient volume, the existing oncological services at the hospital onto which the centre would be added, the distribution of the population on the territory, and the impact that opening a satellite centre might have on the patient volume at the centres currently treating these patients. No mention is made in the literature of a minimum patient volume threshold specific to single-machine centres. Based on the European targets and the volumes at the centres in Québec, the suggested target for single-machine satellite centres would be 300 to 500 treatments per year. Given an anticipated increase of 5 to 30 % in the current clientele from the regions after a new satellite centre opens and the fact that 10 to 25 % of the patients would still be treated at the hub centre because of the complexity of their cases, a minimum target of 300 treatments is likely to be achieved in the Abitibi-Témiscamingue (estimate: 327 to 482 treatments per year) and Gaspésie/Îles-de la-Madeleine (estimate: 318 to 423) regions, but it is not certain that this target would be achieved in the Côte-Nord region (estimate: 250 to 359). Opening a new radiotherapy centre in Gaspésie/Îles-de la-Madeleine could result in an estimated patient volume decrease of 22 to 26 % at the Rimouski centre and of 13 to 16 % at the Gatineau centre.

Lastly, although large distances do not necessarily translate into substantially lower radiotherapy utilization in relation to that for the province as a whole, implementing satellite radiotherapy centres in the regions could help relieve the significant burden that patients have to bear in order to be treated.