Ontario
Cancer Care Ontario
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Guideline 21-2 Version 2

A Quality Initiative of the Program in Evidence-Based Care (PEBC), Cancer Care Ontario (CCO)

Three-Dimensional MR-Guided Intracavitary and Interstitial Brachytherapy for Cervical Cancer

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An assessment conducted in December 2025 deferred the review of Guideline 21-2 Version 2. This means that the document remains current until it is assessed again next year. The PEBC has a formal and standardized process to ensure the currency of each document (PEBC Assessment & Review Protocol)

Guideline 21-2v2 is comprised of 5 sections. You can access the summary and full report here:
https://www.cancercareontario.ca/en/guidelines-advice/types-of-cancer/57316

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Three-Dimensional MR-Guided Intracavitary and Interstitial Brachytherapy for Cervical Cancer
Recommendations

This is a quick reference guide and provides the guideline recommendations only. For key evidence associated with each recommendation, the systematic review, and the guideline development process, see the full report.

GUIDELINE OBJECTIVES

To assess the added clinical value of magnetic resonance (MR)-guided intracavitary (IC) or MR-guided intracavitary/interstitial (ICIS) brachytherapy (BT), compared with two-dimensional (2D) BT and computed tomography (CT)-guided BT.

TARGET POPULATION

Women with potentially curable, non-operable, locally advanced cervical cancer receiving external beam radiation (with or without chemotherapy) and BT.

INTENDED USERS

Intended users include radiation and gynecologic oncologists, physicists, dosimetrists and radiation therapists for the purpose of MR-guided IC and ICIS BT for patients with cervical cancer. Administrators and policy makers will also use the guideline for programmatic planning.

QUALITY OF STUDIES USED TO INFORM RECOMMENDATIONS

All studies used to inform the recommendations received a rating of moderate for overall risk of bias and a rating of moderate for risk of bias on the domain of 'confounding', since none were randomized. Quality assessments for studies informing each recommendation are listed below. More details regarding quality assessment ratings are available in Section 4 (Study Quality) and Appendix 4.

RECOMMENDATIONS, KEY EVIDENCE, AND INTERPRETATION OF EVIDENCE

Recommendation 1
MR-guided (either MR-adaptive or MR-informed) IC or ICIS BT is the preferred method of practice for cervical cancer patients in Ontario and is recommended over 2D BT.
Qualifying Statements for Recommendation 1
• There is evidence to indicate improved tumour control and reduced toxicity with MR-guided BT compared with 2D BT. • Although definitive comparative studies are lacking, in our expert opinion, MR-adaptive BT and MR-informed BT yield comparable results. • Although definitive comparative studies are lacking, in our expert opinion, MR-adaptive BT and MR-informed BT are superior to MR-hybrid BT (with MR before applicator insertion) because of the marked changes in tumour and normal tissue anatomy that can result from applicator insertion, diminishing the relevance of MR images obtained earlier in the course of treatment. • Best-practice MR-guided BT includes the use of IS needles in a proportion of patients to achieve optimal tumour and normal tissue dosimetry.

Recommendation 2
There is a clear benefit of MR-guided BT over CT-guided BT alone in terms of tumour delineation, plan adaptation/optimization, and improved local control. Thus, MR-guided BT is preferred over CT-guided BT.
Qualifying Statements for Recommendation 2
• MR-guided (either MR-adaptive or MR-informed) BT is superior to CT-guided BT because of better tumour visualization, which translates to greater confidence in treatment plan adaptation and optimization, a higher likelihood of achieving optimal tumour and normal tissue dosimetry and a higher expectation of tumour control without toxicity. • CT-guided BT may provide adequate visualization of normal tissues for treatment planning. However, without also having unambiguous visualization of the tumour with the applicator and/or needles in place, flexibility in plan optimization to assure adequate tumour coverage and normal tissue sparing is likely to be constrained.

Recommendation 3
MR-guided ICIS BT (with the use of IS needles) should be considered for patients with asymmetrical or large residual tumours at the time of BT, and in patients with small or large tumours at the time of BT where there is unfavourable normal tissue geometry or dosimetry and a high likelihood of excessive toxicity.
Qualifying Statements for Recommendation 3
• Evidence suggests greater planning flexibility and better tumour coverage without overdosing normal tissues with MR-guided ICIS BT, resulting in a higher likelihood of tumour control without toxicity.