



Title	Intensity-Modulated Radiotherapy
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Aim

To assess the clinical efficacy and cost effectiveness of intensity-modulated radiotherapy (IMRT) compared with standard radiotherapy, to discuss the costs of IMRT, and to estimate the potential budget impact of IMRT on Belgian public health insurance.

Conclusions and results

Well-performed IMRT can improve quality of life in head and neck cancer patients compared with standard radiotherapy. IMRT is more difficult to plan and deliver, and still an area of investigation.

IMRT or 3D conformal radiotherapy are recommended for delivering high-dose external radiation in prostate cancer. IMRT may reduce skin complications after radiotherapy in specific breast cancer patients (eg, large breasted), but no improvement in quality of life could be demonstrated, and long-term outcome data are needed.

Minimal set-up cost for a new IMRT-capable radiotherapy department was estimated at EUR 7 100 000 in the reviewed literature and conversion of a 3DCRT unit into an IMRT unit at EUR 750 000. The hypothetical budget impact of having reimbursed all Belgian prostate and head and neck cancer patients treated in 2003 with IMRT was estimated at EUR 5 000 000 or 5.4% of the external radiotherapy operating budget, breaking down as 72.2% of added fee-for-service expenses, 7.4% of investment costs, and 20.4% of operational costs. Extending IMRT reimbursement to all breast cancer patients in 2003 would have raised the impact to 18.7% (EUR 17 000 000).

Recommendations

- Manufacturers and users of IMRT hardware and software should be made more aware of the risk of inducing secondary malignancies, and product improvement is to be stimulated.
- Currently IMRT used in head and neck cancer patients should be restricted to centers with the

necessary expertise. More appropriate financing of complex IMRT planning in head and neck cancer shall be considered.

- Long-term studies are required to assess the risk of inducing a secondary tumor in the contralateral breast after IMRT before introduction into common practice. Specific research financing of IMRT in breast cancer should be considered.
- More frequent imaging for guidance of IMRT is expected to improve the efficacy and safety of IMRT, particularly in targets showing internal movement, eg, in case of prostate cancer. Financing of imaging for IMRT should be re-assessed.

Methods

The scientific literature was searched for clinical effectiveness, cost effectiveness, and cost studies through electronic databases. Organizational issues were also retrieved from grey literature. Budgetary simulations were conducted for 2002 to 2006 using international literature, local cancer registration data, legal documents, and results from a survey.

Further research/reviews required

- More long-term data are needed to confirm any survival advantage of IMRT and to assess the increased risk of secondary malignancies in comparison with standard external radiotherapy techniques.
- As no firm conclusion could be drawn on the cost effectiveness of IMRT in comparison to alternative interventions, in particular 3DCRT, cost and utility data would be collected within the wider framework of an RCT. In this respect, further full costing analyses, preferably activity based, at the hospital level are a prerequisite.