

# **A multicentre observational study evaluating image-guided radiotherapy for more accurate partial-breast intensity-modulated radiotherapy: comparison with standard imaging technique**

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## Plain English summary

### Image-guided radiotherapy for breast cancer

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## Plain English summary

**W**hole-breast radiotherapy (WBRT) is the standard treatment for breast cancer following breast-conserving surgery (lumpectomy). Cancer recurrences are most likely to occur near the original cancer: the tumour bed. A new technique aims to reduce recurrence by delivering a higher dose to the tumour bed ('boost') during WBRT. Currently, X-rays of the rib cage (standard imaging) are used to ensure accurate delivery of breast radiotherapy. Newer imaging using surgical clips within the tumour bed (clip-based imaging) may be preferable for boost radiotherapy.

The main objective was to compare accuracy of radiotherapy boost with standard and clip-based imaging. The bigger 'safety margin' required around the tumour bed was calculated and a mathematical model was constructed to estimate whether or not the extra volume irradiated caused more side effects. Two hundred and eighteen patients receiving breast radiotherapy, within a national breast boost trial, were studied; all had clip-based imaging, but standard images of the rib cage were available for comparison.

Results show that clip-based imaging is more accurate than standard imaging for boost radiotherapy and safety margins are 5 mm and 8 mm, respectively. The volume of breast tissue irradiated decreased by 29 cm<sup>3</sup> (range 11–193 cm<sup>3</sup>) using clip-based imaging, but estimation of side effects was not possible using the model.

In conclusion, margins less than 8 mm cannot be used safely without clip-based imaging for patients receiving boost radiotherapy as the higher-dose boost treatment may 'miss' the tumour bed. Smaller margins may reduce both cancer recurrence and side effects, but long-term results from ongoing trials are needed.



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