A short video explaining this paper: https://youtu.be/5Xby04NBanY
A companion blog: https://blogs.bmj.com/bmj/2020/08/20/targeted-intraoperative-radiotherapy-for-early-breast-cancer-new-evidence/

Long term survival and local control outcomes from single dose targeted intraoperative radiotherapy during lumpectomy (TARGIT-IORT) for early breast cancer

Vaidya JS, Bulsara M, Baum M, et al

Cite this as: *BMJ* 2020;370:m2836
Find this at: http://dx.doi.org/10.1136/bmj.m2836

Study question Can risk adapted targeted intraoperative radiotherapy (TARGIT-IORT) delivered as a single dose during lumpectomy effectively replace postoperative whole breast external beam radiotherapy (EBRT) for early breast cancer, and what are the long term outcomes?

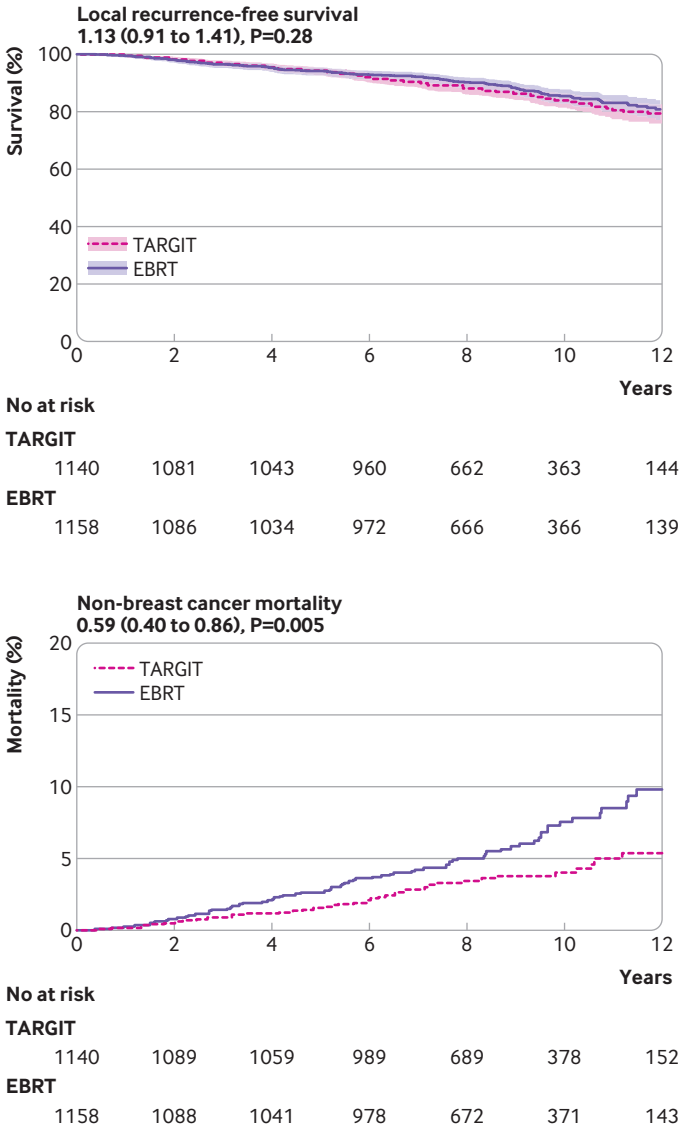
Methods The TARGIT-A international randomised controlled trial (32 centres in 10 countries in the United Kingdom, Europe, Australia, and North America) recruited 2298 women aged 45 years and older with invasive ductal carcinoma up to 3.5 cm (lymph node stage cN0-N1) who were eligible for breast conservation. Participants were randomised before lumpectomy to either single dose TARGIT-IORT or EBRT (standard daily fractionated course over three to six weeks). The main outcome measures were non-inferiority at a margin of 2.5% for five year local recurrence rate, and long term survival.

Study answer and limitations 1140 patients were randomised to TARGIT-IORT and 1158 to EBRT. The study found that TARGIT-IORT was non-inferior to EBRT for local recurrence. At five year complete follow-up the local recurrence risk was 2.11% (24/1140) for TARGIT-IORT compared with 0.95% (11/1158) for EBRT (difference 1.16%, 90% confidence interval 0.32% to 1.99%). 14 fewer deaths occurred with TARGIT-IORT than with EBRT (42/1140 *v* 56/1158). With long term follow-up (median 8.6 years) no statistically significant difference in any breast cancer outcome was found (such as local recurrence-free survival, mastectomy-free survival, and breast cancer mortality), and mortality from other causes was significantly lower in the TARGIT-IORT arm (45 *v* 74 deaths, hazard ratio 0.59, 95% confidence interval 0.40 to 0.86, P=0.005). Two major risk factors for cardiovascular disease and malignant disease were collected (age and body mass index), and they were well balanced between the two randomised arms of this large trial.

What this study adds For most patients with early breast cancer, immediate single dose TARGIT-IORT during lumpectomy was an effective alternative to EBRT, with comparable long term efficacy for cancer control and lower non-breast cancer mortality. TARGIT-IORT should be discussed with eligible patients when breast conserving surgery is planned.

Funding, competing interests, and data sharing Funding was provided by the United Kingdom National Institute for Health Research Health Technology Assessment programme, University College London (UCL) Comprehensive Biomedical Research Centre, and Cancer Research Campaign (now Cancer Research UK). Carl Zeiss sponsored travel for some authors. Data sharing as per UCL policy. Full details available on bmj.com.

Trial registration ISRCTN34086741, NCT00983684.



Long term outcomes of the randomised TARGIT-A trial comparing risk adapted targeted intraoperative radiotherapy (TARGIT) delivered as single dose during lumpectomy with postoperative whole breast external beam radiotherapy (EBRT) for early breast cancer. Data under titles are hazard ratios (95% confidence intervals) and log rank test P values