Leaving out radiotherapy does not affect survival after breast-conserving surgery in older women with low-risk hormone-receptor-positive early breast cancer. Ten-year outcomes for the PRIME II trial, published in the *New England Journal of Medicine*, February 16, found that, although omission of radiotherapy was associated with a ten-fold increased incidence of local recurrence, there were no detrimental effects on distant recurrence or overall survival for patients aged 65 years or older.

“Our trial provides robust evidence indicating that irradiation can be safely omitted in women 65 years of age or older who have grade 1 or 2, ER-high cancers treated by breast-conserving therapy, provided that they receive five years of adjuvant endocrine therapy,” conclude the authors, led by Ian Kunkler, Professor of Clinical Oncology at the University of Edinburgh.

Regardless of age, the standard treatment for early breast cancer is breast conserving surgery (also known as lumpectomy) followed by radiotherapy and hormone treatment to reduce risk of recurrence. However, radiotherapy can place a heavy burden on patients, with side effects linked to heart problems and second cancers. Omission of radiotherapy after breast-conserving therapy in low-risk, older patients with smaller hormone receptor (HR)- positive tumours has been controversial, with only limited long-term level 1 evidence. The PRIME II study, designed by the Scottish Cancer Trials Breast Group (SCTBG), set out to determine whether older patients with low-risk breast cancer could be spared radiation therapy.

Women aged 65 years or older were eligible to participate if they had tumours sized ≤3 cm in the largest diameter that had been treated with breast conserving therapy plus axillary staging and were node-negative, oestrogen receptor positive or progesterone receptor positive (or both) and had clear excision margins (≥1 mm). Women also needed to have received adjuvant or neoadjuvant endocrine therapy.

Between April 2003 and December 2009, 1,326 patients from 76 centres across Europe and Australia were randomised 1:1 to receive either whole-breast irradiation, at 40–50 Gy in 20 to 25 fractions (n=658) or no irradiation (n=668). Tamoxifen, at a dose of 20 mg per day for five years, was recommended as standard adjuvant endocrine therapy.

The five-year results of the PRIME II trial, published in *Lancet Oncology* in 2015, found that radiotherapy was associated with a lower percentage of patients having local breast cancer recurrence (4.1% without radiotherapy vs 1.3% with radiotherapy, P=0.0002).

The latest results of PRIME II at 10 years show:

- The cumulative incidence of local breast cancer recurrence within 10 years was 9.5% in the no-radiotherapy group vs 0.9% in the radiotherapy group (HR 10.4; 95%CI 4.1–26.1; P<0.001).
- The 10-year incidence of distant recurrence as the first event was 1.6% in the no-radiotherapy group vs 3% in the radiotherapy group.
- Overall survival at 10 years was 80.8% in the no-radiotherapy group vs 80.7% in the radiotherapy group.

Breast-cancer-specific survival at 10 years was 97.4% among patients assigned no radiotherapy vs 97.9% among patients assigned radiotherapy. The incidence of regional recurrence did not differ substantially between the two groups.

“Our findings provide additional data indicating that although the omission of irradiation increases the cumulative incidence of local recurrence, it does not have a similar effect on distant disease-free or overall survival,” write the authors.

In an accompanying editorial Alice Ho (Duke University School of Medicine, Durham, North Carolina) and Jennifer Bellon (Dana Farber Cancer Institute and Brigham and Women's Hospital, Harvard Medical School in Boston, Massachussetts) write, "Any doubt that radiotherapy cannot be omitted in women 65 years of age or older with ER-positive, early-stage breast cancer can be put to rest. The 10-year follow-up in the trials are extremely reassuring, given the long natural history of ER-positive breast cancer. These results do not undermine the value of radiotherapy in enhancing local control, which is a compelling end point in and of itself, particularly now that radiotherapy can be delivered in less burden-some ways."

Marisa Weiss, the chief medical officer of the US charity Breastcancer.org, warns that there is no 'one size fits all' for women at any age, including those who are 65 and older. "Most women want to reduce their risk of recurrence even if there is no survival benefit (as seen for the whole group of people in this study). If women are in good health and prepared to do what is reasonable and effective to lower their risk of local recurrence, then adding radiation to their treatment plan will lower their risk of recurrence by up to 10-fold, that was a 90% plus drop in risk in this study," Weiss told *Cancerworld*. "Plus today, there are many types of radiation treatment courses that can be as short as five treatments, ranging up to four to six weeks, to part or all of the breast that depends on their unique situations."