Radiotherapy boost can cut breast cancer treatment time by at least one week, finds clinical trial

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Treatment times for radiotherapy could be reduced for some early breast cancer patients, according to a trial led by University of Cambridge and

The Institute of Cancer Research, London.

Results from the IMPORT HIGH trial, published in *The Lancet*, show that giving some breast cancer patients a targeted additional dose of radiotherapy at the same time as treatment to the whole breast (known as simultaneous integrated boost or SIB) cuts the time taken to complete treatment by at least one week.

The trial found that SIB radiotherapy given at the right dose works just as well as existing radiotherapy techniques in reducing the risk of the cancer returning in the treated breast.

The chance of the cancer returning to the treated breast remained very low after five years across all treatment groups. Patients given the lower dose of SIB radiotherapy reported similar rates of side-effects, like breast hardening or firmness, as those who received the standard sequential radiotherapy schedule.

Currently, women with a higher than average risk of cancer coming back in their treated breast are given an additional radiotherapy dose to the original site of the tumor after radiotherapy is given to the entire breast. This approach, known as sequential boost, maximizes the chances that any remaining cancer cells are removed from the breast.

But it takes longer for women to complete sequential boost radiotherapy, requiring them to attend more hospital appointments. In the UK, many women requiring breast boost radiotherapy are given four weeks of radiotherapy—3 weeks to the whole breast with one week boost afterwards. In some countries, women are given 6.5 weeks of radiotherapy—five weeks of whole breast radiotherapy with one to 1.5 weeks boost afterwards. SIB radiotherapy cuts this down to just three weeks in total.

A boost treatment also increases the chance of having potentially long term side-effects after treatment, including changes in shape, size and texture of the breast that can affect women's self-esteem and well-being.

In total, 2,617 patients at 76 centers took part in the trial. Patients were divided into three groups. The first group received whole breast radiotherapy with a sequential boost over 4.5 weeks in total. The second and third groups each received two different doses of SIB radiotherapy. Patients received whole breast radiotherapy with a simultaneous boost of either lower or higher dose a dose over three weeks in total. There was no advantage shown for those who received the higher boost dose it also led to slightly increased rates of side effects.

Professor of Breast Cancer Clinical Oncology at Cambridge University, NIHR Professor and chief investigator for the trial, Professor Charlotte Coles, said, "Some women have to live with permanent breast changes after radiotherapy which may affect their well-being. With SIB, we can deliver high-quality effective radiotherapy while minimizing toxicity from it.

"This is a careful step towards even shorter courses of radiotherapy that include more complex techniques. By delivering more targeted boost radiotherapy over shorter time periods, women can get on with their lives more quickly."

The FAST Forward trial, which was also led by the ICR-CTSU and reported results in 2020, showed that whole breast radiotherapy could be given over a week. Researchers are now hoping to run another clinical trial to find out if SIB radiotherapy can be delivered to patients requiring a boost in just one week.

Professor Judith Bliss, Professor of Clinical Trials at The Institute of Cancer Research, London, Director of the Cancer Research Clinical

Trials and Statistics Unit at the ICR which is managing the IMPORT HIGH trial, said, "For some patients who have a higher risk of seeing their cancer return in the treated breast, delivering an extra, targeted boost of radiotherapy to breast tissue close to the original tumor site is an effective way to lower that risk and help keep cancer from returning to the breast.

"IMPORT HIGH has uncovered how we can streamline our delivery of these radiotherapy boosts—giving them simultaneously with whole breast radiotherapy—without impacting the effectiveness of treatment, or causing patients additional side effects. We hope this trial will change clinical practice—allowing women to benefit from sophisticated radiotherapy delivery with shorter treatment times and fewer hospital visits."

The team hope that SIB radiotherapy could reduce the costs for patients traveling to hospital and cut the time taken to undergo treatment and recovery. It could be quickly adopted by the NHS and health systems worldwide as standard radiotherapy equipment is used, freeing up valuable appointment visits that could be used to treat more cancer patients sooner.

Chief Executive of Cancer Research UK, Michelle Mitchell, said, "At a time when health services across the UK are facing chronic staff shortages in cancer services, we need to look at new ways to get more patients treated as quickly as possible. In addition to training up more staff, more precise forms of radiotherapy can help to reduce the number of people who are waiting too long to begin vital treatment.

"Trials like IMPORT HIGH are leading the way in delivering smarter radiotherapy with existing technology. We hope that treatment centers across the UK and globally will rapidly adopt this approach to beat breast cancer sooner and give patients more precious time with their loved

ones."

More information: Charlotte E Coles et al, Dose-escalated simultaneous integrated boost radiotherapy in early breast cancer (IMPORT HIGH): a multicentre, phase 3, non-inferiority, open-label, randomised controlled trial, *The Lancet* (2023). DOI: 10.1016/S0140-6736(23)00619-0

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