

Study shows shorter-course radiation better option for breast cancer patients than conventional schedule

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Giving higher doses per fraction of radiation therapy over a shorter time after breast cancer surgery significantly reduces the risk of side effects

and improves quality of life compared with a conventional schedule, finds a study published by *The BMJ* .

Although survival and recurrence rates were similar, this approach, known as hypofractionation, is safer, more convenient for patients, and reduces costs for health care systems, and should be the preferred treatment option, say the researchers.

Conventional fractionation [radiation therapy](#) has been the standard of care for most patients with breast cancer since the 1970s. It typically delivers a total dose of around 50 Gray (Gy) in 25–28 fractions of 1.8–2 Gy over five to six weeks.

In more recent years, hypofractionated radiation therapy has been introduced after it was found to be as effective as conventional radiation therapy to improve patient survival. Hypofractionated therapy can be divided into moderate (13–16 fractions of 2.65–3.3 Gy over three to five weeks) and ultra-hypofractionation (5 fractions of even higher fractional dose).

But to date, no comprehensive assessment has been made of the overall benefit, frequency and severity of potential side effects, aesthetic consequences, and implications for quality of life across fractionation schemes.

To address this, researchers searched scientific databases to identify randomized controlled trials published up to 23 October 2023 that compared these fractionation schedules.

A total of 35 trials conducted from 1986 to 2023 and involving 20,237 patients who had undergone breast conserving therapy or mastectomy were included. The trials were of varying quality and risk of bias, but the researchers were able to assess the certainty of evidence using the

recognized GRADE system.

The main outcomes of interest were acute radiation dermatitis, and long-term side effects including hyperpigmentation and breast shrinkage. Additional outcomes assessed were cosmesis (cosmetic appearance), quality of life, recurrence, and survival.

After pooling the data, the researchers found that moderate hypofractionation reduced the risk of acute radiation dermatitis by 46% in breast conserving therapy patients and by 32% in mastectomy patients, compared with conventional fractionation.

Hyperpigmentation and breast shrinkage were also less frequent after moderate hypofractionation than after conventional fractionation. However, in the trials that only considered breast conserving therapy population, these differences were not statistically significant.

Moderate hypofractionation was also associated with improved cosmesis and [quality of life](#) compared with conventional fractionation. Data for ultra-hypofractionation were less conclusive, but its safety and effectiveness seem to be similar up to at least five years of follow-up, note the authors.

Survival and recurrence were similar between ultra-hypofractionation, moderate hypofractionation, and conventional fractionation.

The authors acknowledge several limitations, including risk of bias due to the lack of blinding, which is not possible in this kind of intervention, and not all outcomes were reported for all trials, especially for side effects and cosmesis, making it difficult to draw definitive conclusions.

Nevertheless, they used a rigorous approach to evaluate risk of bias and quality of evidence, and results were similar after further sensitivity

analysis, suggesting they are robust.

As such, they say, "Given the advantages of reduced treatment time and side effects, enhanced patient convenience, and potential cost effectiveness, shorter radiation protocols should now be considered the standard approach, while longer-course regimens (25 fractions or more) should be reserved for highly selected cases.

"Further research and longer follow-up are needed to definitively determine the optimal use of ultra-hypofractionation and to solidify these findings."

More information: Randomised controlled trials on radiation dose fractionation in breast cancer: systematic review and meta-analysis with emphasis on side effects and cosmesis, *The BMJ* (2024). [DOI: 10.1136/bmj-2023-079089](https://doi.org/10.1136/bmj-2023-079089)

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