



Comparative Analysis of Conventional Fraction versus Hypofractionation Radiotherapy in the Management of Glioblastoma: Results from a Nationally Representative Sample

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Objectives: Glioblastoma (GBM) is a highly aggressive brain cancer, and optimal radiation therapy (RT) regimens continue to be crucial for its treatment. In the treatment of GBM, recent research has investigated hypofractionated radiation (HFRT) as a possible substitute for conventional fractionated RT (CFRT), assessing its efficacy in terms of clinical outcomes and treatment completion.

Despite recent developments, little is known about how fractionation regimens affect immunological responses and patient adherence. This scoping review assesses the comparative efficacy and compliance of HFRT and CFRT in treating GBM in patient populations.

Methods: A detailed Google Scholar search was conducted on August 11, 2025, using the search terms "conventional vs hypofractionation", "radiotherapy", and "glioblastoma management". A total of 8060 articles were found, of which 14 met the inclusion criteria and were included in the final analysis. Analysis of several cohorts and multiple randomized controlled trials, including studies by Nishioka et al. (2023), Malmström et al. (2012), and Roa et al. (2004), was carried out. Data from patients 60 years of age or older with newly diagnosed GBM who were undergoing CFRT or HFRT with or without concurrent temozolomide were analyzed. Important papers, such as Navarra et al. (2018) and Pacheco et al. (2023), were included in the clinical dataset. Results like survival rates, immunological response markers, and treatment compliance were also analyzed.

Results: From the 14 studies meeting inclusion criteria, a total of 1,234 patients were analyzed. The use of HFRT was associated with greater completion rates (93.2%) and a significant reduction in treatment interruptions, particularly for elderly and frail patients, compared to CFRT (85.7%). While the Nordic Phase 3 trial (Malmström et al., 2012) showed a survival benefit for HFRT when combined with temozolomide, studies such as Perlow et al. (2022) and Fiorella et al. (2025) demonstrated improved tolerability in the elderly population. Additionally, Nishioka et al.'s (2023) study on immune response suggests that HFRT may produce better immune control than CFRT. Propensity scores matched trials (Dohopolski et al., 2025) corroborated these findings, demonstrating that HFRT reduced toxicity and enhanced quality of life outcomes.

Conclusion(s): With major benefits in immune system regulation and treatment completion, HFRT has become a viable substitute for CFRT for GBM, particularly in the elderly and frail. How GBM is managed could be substantially altered by this modality, particularly for older patients who are often excluded from traditional clinical trials. Large-scale prospective trials are required for further validation; however, the growing use of HFRT in clinical practice suggests that its application may be increasingly widespread.

