The aim of this review is to explore the changing utility of radiotherapy in the treatment of patients with glioblastoma over the past 60 years. Together with surgery, radiotherapy has always been the cornerstone of treatment of glioblastoma, but techniques have significantly advanced over this time. The exploration of early two-dimensional techniques, investigation of dose escalation, concomitant chemotherapy and modern techniques, including intensity-modulated radiotherapy, image-guided radiotherapy, and volumetric-modulated arc therapy will be covered. In addition, current controversies including decreasing margin size, re-irradiation, treatment of elderly patients, and novel imaging tracers will be discussed. Future directions including immunotherapy and tumour treating fields are examined. Radiotherapy-based treatments cannot rely solely on advances in chemotherapy or immunotherapy to improve the overall survival of patients with glioblastoma. Radiation oncology needs to continue to develop and improve the delivery, target definition, and dose of radiotherapy to these patients to improve their survival and the toxicity associated with treatment.