Molina Clinical Policy
Radiation Therapy for Non-Oncologic Indications: MEDICARE
Policy No. 492b

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OVERVIEW

Low-dose radiation therapy (LDRT) is a non-invasive, targeted therapy that uses smaller doses of ionizing radiation compared to standard doses of radiation therapy for cancer treatment. LDRT can be beneficial as a treatment option for select non-oncologic indications due to its anti-inflammatory and pro-inflammatory effects (Hammadeh et al. 2025). Very low doses (e.g., 0.025-0.5 Gy) can "reduce pro-inflammatory markers such as ICAM-1 and Thy-1 while increasing capillary density and modifying extracellular matrix components, indicating reparative or compensatory responses (Hammadeh et al. 2025)." However, higher doses have been attributed to inducing systemic inflammation, suggesting that caution must be taken when selecting patients and treatment dosing (Hammadeh et al. 2025). LDRT has been evaluated for use for several non-oncologic indications.

Heterotopic ossification is characterized by the development of mature lamellar bone in soft tissues where bone normally does not exist. There are three primary etiologies of heterotopic ossification: traumatic, neurogenic, and genetic. The most common etiology is trauma resulting in fractures or dislocations and the traumatic injury may be associated with a surgical procedure (e.g., joint replacement or repair). Neurogenic heterotopic ossification is generally associated with the hips, shoulders, extensor side of the elbows, and knees and may also include incision sites, the kidneys, the uterus, the corpora cavernosum, and the gastrointestinal tract. Risk factors for neurogenic ossification may include spasticity, older age, deep vein thrombosis, and tracheostomy, among others. Genetic heterotopic ossification is generally associated with fibrodysplasia ossificans progressiva, a genetic disorder that is characterized by abnormal and progressive bone formation in soft tissues following injuries. Fibrodysplasia ossificans progressiva generally manifests at birth with malformations of the great toe and progresses to widespread skeletal immobilization due to progressive ectopic bone formation (Babu et al. 2026).

Heterotopic ossification is typically evaluated using radiographic imaging with the Brooker Staging System being used to classify severity. The decision to treat heterotopic ossification is dependent upon severity, with asymptomatic cases generally being observed and interventional treatment reserved for more advanced cases. The treatment for heterotopic ossification consists of early passive range of motion exercises, nonsteroidal anti-inflammatory drugs, bisphosphonates, and/or low-dose external beam radiotherapy. A single dose of low-dose external beam radiotherapy may be useful at reducing the incidence of heterotopic ossification in patients that are intolerant of nonsteroidal anti-inflammatory drugs. The dose of external beam radiotherapy is generally 700-800 cGy (7-8 Gy). However, a dosage as high as 5 fractions of 3.5 Gy may be delivered for those considered high-risk for the occurrence of heterotopic ossification (Mücke et al. 2022). External beam radiotherapy may be delivered up to 24 hours preoperatively or within 72 hours postoperatively (e.g., total hip arthroplasty) in patients deemed high risk for heterotopic ossification. Prophylactic treatment with radiotherapy is considered on a case-by-case basis due to the potential risks of preventative treatment (Babu et al. 2026; Lee et al. 2022).

Graves' ophthalmopathy, also called thyroid eye disease or Graves orbitopathy, is an autoimmune disease that occurs primarily in patients with Graves' disease, though it may also occur in patients with Hashimoto's thyroiditis. Risk factors that increase the risk of Graves' ophthalmopathy include gender, smoking history, high titers of thyrotropin receptor antibodies, high serum cholesterol levels, and treatment of Graves' disease with radioiodine therapy. Graves' ophthalmopathy is generally more common in females than males. However, males with eye involvement are more

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likely to have an increase in severity of Graves' ophthalmopathy during follow-up likely due to males experiencing more severe Graves' disease compared to females. Major symptoms of Graves' ophthalmopathy include the sensation of a gritty or foreign object in the eyes, excessive tearing that is made worse by exposure to cold air, wind, or bright lights, blurring of vision, diplopia, color vision desaturation, loss of vision, and periorbital swelling. Signs that characterize Graves' ophthalmopathy include proptosis, conjunctival inflammation, periorbital edema, and extraocular muscle dysfunction. Treatment of Graves' ophthalmopathy is generally through reversal of hyperthyroidism and smoking cessation. Other recommended treatments depend on the severity of Graves' ophthalmopathy and may include selenium, insulin-like growth factor 1 receptor antagonists, and glucocorticoids. Secondary medical treatments that can be considered if Graves' ophthalmopathy does not respond to initial medical therapies include tocilizumab, tiruximab, mycophenolate mofetil, and external orbital radiation. External orbital radiation is generally considered in patients with moderate-to-severe Graves' ophthalmopathy that cannot receive or fail to respond to intravenous glucocorticoids. The dose of radiation therapy is typically 20 Gy administered in 10 fractions of 2 Gy over a period of two weeks ([1-2]Davies & Burch 2026).

Keloids are a fibroproliferative disorder that occur due to deviations during wound healing and are more prevalent in those with darker skin types. Keloids differ from hypertrophic scars in that they rise above the skin level and continually grow beyond the original wound site and invade adjacent, healthy skin. Keloids may develop anywhere, including during wound healing for burn injuries. They may cause disfigurement, pain and itch, and impair function and quality of life. Treatment is dependent upon severity and whether the lesions will respond to conservative treatment. Treatment of small-to-moderate size single keloids (< 20 cm^2) generally consists of intralesional injection of corticosteroids, corticosteroid tape and/or plaster, or intralesional chemotherapeutic agents. Surgical excision is generally reserved for large or multiple keloids or for individuals with small or single site keloids that prefer surgical excision for cosmetic purposes. However, keloids have a very high rate of recurrence following surgical excision with reported rates of 45-100%. Postoperative radiation therapy is generally the adjuvant therapy of choice as it reduces the formation of blood vessels and suppresses inflammation. This promotes a smooth healing process and reduces the recurrence of keloids. The use of postoperative radiation therapy for keloids in children is controversial due to concerns for growth impairment and radiation exposure (e.g., carcinogenic risk) (Casale & Tiralongo 2026; Hu et al. 2026; Ogawa 2026; Gauglitz 2025).

Osteoarthritis is the most common form of arthritis that primarily affects the hands, knees, hips, and spine. Osteoarthritis may also affect the shoulders, elbows, wrists, and ankles. Osteoarthritis is generally diagnosed based on signs and symptoms. The primary symptoms of osteoarthritis include joint stiffness, tenderness, bony enlargement, joint deformity, and increasing stages of pain associated with joint use. Routine imaging and synovial fluid analysis are generally not indicated. Individuals with osteoarthritis may experience "flares" that are characterized by episodes of a rapid onset of increased pain that lasts for several days before the pain returns to baseline. Flares may be triggered by activity-related factors. Non-pharmacologic therapies for osteoarthritis include weight management, exercises, braces and foot orthoses, and assistive devices. Pharmacologic therapies include direct intraarticular injection of anti-inflammatory drugs. Some cases of osteoarthritis require surgical manipulation or joint replacement (Abhishek & King 2026; Fazilat-Panah et al. 2025; Deveza 2024).

Plantar fasciitis is defined as the inflammation of the plantar fascia, the thick band of connective tissue that connects the heel bone to the base of the toes. Degeneration and inflammation of the plantar fascia caused by repetitive micro trauma leads to chronic heel pain. The characteristic symptom of plantar fasciitis is heel pain, which is usually localized to the plantar medial aspect of the heel. Pain is most noticeable during weight-bearing activities, particularly the first weight-bearing step of the day or following periods of sitting or recumbency. Plantar fasciitis is the most common cause of heel pain presenting in the outpatient setting. The exact incidence and prevalence of plantar fasciitis by age are unknown; however, it is estimated that plantar fasciitis accounts for approximately one million patient visits each year. Plantar fasciitis is primarily treated medically, with approximately half of patients show improvement within three months, and more than 80% achieve full resolution by one year. No available intervention has been demonstrated to change this natural course. Stretching exercises, ice, activity modification, weight loss in overweight patients, recommendations for appropriate footwear, arch taping, nonsteroidal anti-inflammatory medications, and shock-absorbing shoe inserts or orthoses are among the first-line standard treatments. If initial treatment fails, second-line options include night splints, steroidal anti-inflammatory injections, or a walking cast (Buchbinder 2026; Buchanan et al. 2024). Radiation therapy has been used in parts of Europe as a treatment for plantar fasciitis; however, there are concerns regarding the "theoretical possibility of late-onset hematopoietic malignancy…[so] radiation therapy is seldom used to treat plantar fasciitis in other parts of the world (Buchbinder 2026)."

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RELATED POLICIES

MCP-338: Plantar Fasciitis Treatments
MCP-402: Plantar Fasciitis Surgery
MCP-443: Fractional CO2 Laser Treatment for Traumatic and Burn Scars
MCP-463: Radiation Therapy for Oncologic Indications

COVERAGE POLICY

Medically Necessary

Graves' Ophthalmopathy
Radiation therapy for Graves' ophthalmopathy is **considered medically necessary** for members who meet ALL the following criteria:

1. The member has moderate-to-severe active Graves' ophthalmopathy that has failed or is contraindicated for treatment with conservative therapies (e.g., glucocorticoid therapy, radioactive iodine treatment, etc.)

2. The member's plan of care includes steps to address causes of hyperthyroidism (e.g., smoking cessation, thyroidectomy, etc.)

Heterotopic Ossification
Radiation therapy for heterotopic ossification is **considered medically necessary** for members who meet ALL the following criteria:

1. The member has ANY of the following risk factors:
    a. Previous occurrence of heterotopic ossification, or is considered high-risk for the development of heterotopic ossification
    b. Member has documented intolerance or contraindication to NSAID therapy and cannot receive it post-operatively

2. Low dose radiation therapy is planned as a preventative therapy within 72-hours following surgery (e.g., total hip arthroplasty, elbow arthroplasty)

Keloids
Radiation therapy for keloids is **considered medically necessary** for Members who meet ALL the following criteria:

1. Member is ≥ 18 years of age

2. Keloid scar results in pain or functional impairment

3. The keloid lesion has failed or is contraindicated for conservative treatment (e.g., intralesional corticosteroid injections, steroid tapes/plasters, 5-fluorouracil, etc.)

4. Low dose radiation therapy is planned as a preventative therapy within 72-hours following surgical excision

Limitations and Exclusions

Low-dose radiation therapy for all other indications (e.g., osteoarthritis, plantar fasciitis, etc.) is considered **experimental, investigational, and unproven** due to insufficient evidence in the peer-reviewed medical literature to establish long-term safety, efficacy, and effect on net health outcomes.

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SUMMARY OF MEDICAL EVIDENCE

Graves Ophthalmopathy

There is a growing body of evidence to support the use of low-dose radiation therapy (LDRT) as a treatment option for active, moderate-to-severe Graves ophthalmopathy that does not respond to conservative treatment (e.g., glucocorticoids) or where conservative treatment is contraindicated. The CIRTED trial (Rajendram et al. 2018) compared the safety and efficacy of radiotherapy or sham radiotherapy combined with azathioprine or placebo. Results from 48-week follow-up showed no benefit for the addition of radiotherapy. However, the 3-year follow-up results from the CIRTED trial (Taylor et al. 2023) showed higher quality of life scores and potential for the reduction of lid surgery and diplopia in those undergoing radiotherapy, suggesting that the effects of radiotherapy may become more evident in longer-term follow-up. Additionally, a Cochrane review (Rajendram et al. 2012) assessed the safety and efficacy of orbital radiotherapy and concluded that orbital radiotherapy was more effective than sham radiotherapy for the treatment of mild-to-moderate Graves ophthalmopathy.

Randomized Controlled Trials

Taylor et al. (2023) reported the 3-year follow-up of eligible participants in the CIRTED trial. Data was available for a total of 68/126 (54%) participants. The 3-year follow-up used the ophthalmopathy index (OI), thyroid eye score (TES), clinical activity score (CAS), European Group on Graves' Orbitopathy (EUGOGO), and Graves Ophthalmopathy Quality of Life (GOQOL) scores to assess longitudinal features and stability of disease. Intervention groups were relatively equal in distribution with 17 in the placebo/sham radiotherapy group, 16 in the placebo/radiotherapy group, 16 in the azathioprine/sham radiotherapy group, and 19 in the azathioprine/radiotherapy group. Of the 68 participants available for 3-year follow-up, "64 provided data on their requirement for ophthalmological surgery, 58 on CAS score, 52 on binary clinical composite outcome measure (BCCOM), 52 on GOQOL, and 49 on OI. The EUGOGO score could be calculated from the individual measurements in [the] dataset...for 47 trial subjects." No significant differences were noted in baseline characteristics between groups except for non-Caucasians being less likely to provide 3-year data (OR = 0.30, 95% CI 0.11-0.79, p = 0.02). No clear benefit was observed in improvement of BCCOM, modified EUGOGO, or OI at 3 years for those receiving azathioprine or radiotherapy. CAS, OI, and TES improved over the 3-year period. Approximately 24/64 (37.5%) participants required surgical intervention with a pre-treatment disease duration > 6 months being associated with an increased need for surgical intervention (OR = 16.8, 95% CI 2.95-95.0, p = 0.001). Of those requiring surgical intervention, 16 required lid surgery, 12 required orbital decompression, 2 required strabismus correction, and 5 required both lid and decompression surgeries. Additionally, "higher baseline levels of CAS, OI, and TES but not early improvement in CAS were associated with increased requirement for surgery." The decision to perform surgical interventions was not protocolized and individual clinical teams made the decision with participant consent. Baseline diplopia and palpebral aperture were both associated with a need for orbital decompression (diplopia: OR = 6.00, 95% CI 1.78-20.3, p = 0.004; palpebral aperture: OR = 3.18, 95% CI 1.54-6.57, p = 0.002). Researchers noted that there was "no clear benefit beyond the effect of high-dose oral steroids in individuals randomized to receive azathioprine or radiotherapy on BCCOM, OI, CAS, and EUGOGO score at 3 years." There was no observed additional benefit in surgical intervention or quality of life measures associated with azathioprine. Researchers also noted that results for radiotherapy are not clear as there was no evidence of benefit for radiotherapy in the original study while the current study shows "that those randomized to receive radiotherapy had a higher GOQOL-AP score [median 81.3 (IQR 62.5-93.8) vs median 68.9 (IQR 31.2-87.5), p = 0.03] than those who did not." There was also a potential reduction in lid surgery associated with radiotherapy (OR = 0.17, 95% CI 0.03-1.03, p = 0.05) although the confidence interval crossed the equality threshold. Additionally, "analysis of key individual components of outcome measures did suggest radiotherapy reduced diplopia." Limitations of this study include that steroids were administered orally instead of intravenously, a relatively small sample size (despite this study including a much larger number of participants than similar studies), the number of statistical tests performed raises the possibility of a type 1 error, and only 54% of original participants provided data for 3-year follow-up.

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Systematic Reviews and Meta-Analyses

Zhou et al. (2020) conducted a network meta-analysis of 33 studies with 1846 participants with the goal "to provide an overall profile of the efficacy and tolerability of various interventions for active and moderate-to-severe Graves ophthalmopathy." A total of 21 interventions were assessed across all studies with some including combination treatments (e.g., glucocorticoids and orbital radiotherapy). All treatments were compared to no treatment. In the network meta-analysis, orbital radiotherapy plus IV glucocorticoids ranked first compared to no treatment (OR 27.11, 95% CI 4.57-160.92). Orbital radiotherapy plus oral glucocorticoids (OR 4.88, 95% CI 1.25-19.06), intravenous glucocorticoids alone (OR 4.96, 95% CI 1.96-12.55), and orbital radiotherapy alone (OR 1.94, 95% CI 0.69-5.43) had less efficacy than orbital radiotherapy plus intravenous glucocorticoids compared to no treatment. A meta-regression and subgroup analyses based on publication year, age, female percentage, trial duration, euthyroidism, and risk of bias showed a non-significant interaction for all interactions. Studies focused on rituximab were omitted due to significant local inconsistency and a sensitivity analysis now showing significant superiority to no treatment for oral glucocorticoids (OR 4.74, 95% CI 1.58-14.22), orbital radiotherapy (OR 3.64, 95% CI 1.42-9.35), and oral glucocorticoids plus orbital radiotherapy and azathioprine (OR 13.02, 95% CI 2.88-58.93). Also in the sensitivity analysis, orbital radiotherapy (OR 66.49, 95% CI 13.16-335.92) ranked second behind mycophenolate mofetil (OR 90.27, 95% CI 20.20-403.29) compared to no treatment. Authors concluded that "a robust recommendation regarding the best treatment cannot be made, because most evidence was rated as low or very low quality according to the [GRADE] framework. Large RCTs and individual participant data meta-analyses are necessary to confirm and explore potential moderators."

Heterotopic Ossification

There is a moderate body of evidence to support the use of low-dose radiation therapy (LDRT) for the prevention of heterotopic ossification following joint arthroplasty. Radiation therapy for the prevention of heterotopic ossification is generally administered 24-72 hours postoperatively (Liu et al. 2017). A RCT conducted by Liu et al. (2017) sought to determine the efficacy of doses of 400 cGy (4 Gy) vs 700 cGy (7 Gy) in high-risk patients following total hip arthroplasty. The dose of 400 cGy was associated with a significantly greater number of patients demonstrating progression of heterotopic ossification compared to patients receiving a dose of 700 cGy. Other studies have used varying doses of radiation therapy ranging from 5 Gy delivered in 1-2 fractions to 20 Gy delivered in 10 fractions with most studies concluding that higher doses (≥ 7 Gy) are potentially more effective in preventing progression of heterotopic ossification (Puga et al. 2025; Wen et al. 2025). However, there is no definitive conclusion regarding the most effective total dose, dosing fractionations, or timing of radiation therapy and additional high-quality studies are needed. A meta-analysis conducted by Wen et al. (2025) demonstrated that the incidence of heterotopic ossification is much lower in those receiving radiation therapy compared to a control treatment (e.g., standard of care) regardless of Brooker grading in those undergoing total hip arthroplasty. Wen et al. (2025) also observed that those undergoing non-total hip arthroplasty surgical interventions (e.g., elbow) experienced a lower incidence of heterotopic ossification when the Brooker grade was more severe (e.g., III-IV). Additional large, high-quality studies are needed to confirm these results.

Randomized Controlled Trials

Römer et al. (2026) conducted a retrospective 1:3 matched cohort study comparing 7 Gy of radiation therapy delivered in a single fraction 20-28 hours preoperatively to postoperative diclofenac 50 mg two times daily for ≥ 14 days in patients undergoing a total hip arthroplasty. The primary outcome was radiographic presence of any severity of heterotopic ossification (Brooker grade > 0). Secondary outcomes included heterotopic ossification grade ≥ 2, associations with age, sex, and prosthesis fixation type, and potential prophylaxis-by-sex interaction. Inclusion criteria included patients that underwent total hip arthroplasty between January 2013 and October 2023 at a single center in Germany. Exclusion criteria included missing radiographs ≥ 362 days postoperatively, prior ipsilateral hip surgery, or pre-existing heterotopic ossification in the ipsilateral hip. A total of 344 patients were included in the study with 86 in the radiation therapy cohort and 258 in the NSAID cohort. Sequential matching was performed with radiation therapy patients identified first. Mean age was comparable between groups (radiation therapy = 70.01±9.00 years vs. NSAID = 69.45±8.98 years). Sex distribution was also similar (radiation therapy = 49/86 [57%] females, NSAID = 147/258 [57%] females). Prosthesis fixation type was mostly cementless in both groups (89.5%). Mean interval from surgery to outcome radiography was 824.73±500.94 days for the radiation therapy cohort compared to 921.97±596.67 for the NSAID cohort. There was no statistically significant association between prophylaxis strategy and heterotopic ossification > grade 0 (OR for radiation therapy: 0.79, 95% CI 0.43-1.46, p = 0.449). There was also no statistically significant association observed for heterotopic ossification ≥ grade 2 (OR 0.77, 95% CI 0.33-1.80, p = 0.541). Individually adjusting for age and follow-up interval did not alter estimated treatment effects and adjusting for age and follow-up interval together did not alter estimated treatment effects. Researchers noted that "[radiation therapy] was

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associated with a nonsignificant trend toward lower Brooker grades compared with NSAIDs (common OR 0.78, 95% CI 0.42-1.43, p = 0.419)" and "female sex was associated with significantly lower odds of developing [heterotopic ossification] compared with male sex (OR 0.43, 95% CI 0.24-0.73, p = 0.002)." Heterotopic ossification rates for men were 37/111 (33%) for NSAIDs and 6/37 (16.2%) for radiation therapy when stratified by sex and prophylaxis. Heterotopic ossification rates for women were 21/147 (14.3%) for NSAIDs and 10/49 (20.4%) for radiation therapy when stratifying by sex and prophylaxis. Researchers concluded that findings “did not suggest an excess [heterotopic ossification] risk with the institutionally used 20 to 28-hour preoperative [radiation therapy] schedule compared with postoperative NSAID prophylaxis.” Additionally, there may be sex-specific effects on prophylaxis. Limitations of this study included potential confounding (radiation therapy was reserved for patients with contraindications to NSAID prophylaxis), possible selection bias due to nonrandomization, no a priori sample size calculation was performed, the primary endpoint may be affected by bias due to variability in timing, and some analyses may be affected by a sparse number of events.

Systematic Reviews and Meta-Analyses

Wen et al. (2025) completed a meta-analysis of 7 studies with 933 participants with the goal of determining the efficacy of radiotherapy in preventing heterotopic ossification following total hip arthroplasty or other surgical procedures. A total of 594 participants received radiotherapy and 339 were in the respective control group. Of the 933 participants, 784 underwent total hip arthroplasty and 149 received other surgical interventions. Inclusion criteria for the meta-analysis included studies focusing on trauma/surgery patients requiring heterotopic ossification prophylaxis, those undergoing radiotherapy intervention or standard of care, and human clinical trials with mandatory 12-week radiographic surveillance. Exclusion criteria consisted of studies including patients taking NSAIDs, retrospective studies, case series, abstracts from conferences, and secondary reviews. The Brooker grading system was used for the categorization of heterotopic ossification severity. "The total incidence of HO was 17.3% in RT group and 61.7% in control group" with significant heterogeneity. The meta-analysis showed a significantly lower incidence of heterotopic ossification in the radiotherapy group (MD = 0.31, 95% CI 0.18-0.56, p < 0.0001). A subgroup analysis was completed for total hip arthroplasty and non-total hip arthroplasty groups with one study being identified as the main source of heterogeneity. However, removing that study in sensitivity analysis did not alter the results. High heterogeneity was observed for Brooker I-II with radiotherapy significantly reducing the incidence of Brooker grade I-II HO (MD = 0.47, 95% CI 0.27-0.84, p = 0.0002) compared to control. Subgroup analysis confirmed the effectiveness of radiotherapy in reducing Brooker I-II heterotopic ossification after total hip arthroplasty but not for the non-total hip arthroplasty group. Low heterogeneity was noted for Brooker III-IV heterotopic ossification with radiotherapy significantly reducing the incidence of severe heterotopic ossification (MD = 0.06, 95% CI 0.03-0.12, p < 0.00001) in both total hip arthroplasty and non-total hip arthroplasty groups. Adverse events were reported in 5 studies with 26 events observed in the radiotherapy cohort and 16 in the control cohort. There was "a marginal, nonsignificant trend toward increased adverse reactions following radiotherapy (MD = 1.66, 95% CI 0.98-2.80, p = 0.06)." One study (Hamid et al. 2010) reported 9 cases of bone nonunion compared to 1 case in the control group following elbow surgery. No radiotherapy-related complications (e.g., dermatitis, myelosuppression, tumors, etc.) were reported. Authors concluded the "meta-analysis strongly supports the preventive effect of radiotherapy on heterotopic ossification, especially for high-risk patients and in cases that other treatments, like NSAIDs, are contraindicated or avoided. However, the risk of nonunion in elbow treatments warrants caution. Further prospective randomized controlled trials, particularly focusing on non-hip joints, are necessary to validate these findings."

Keloids

There is a robust body of evidence to support the use of radiation therapy as an adjuvant therapy following surgical excision of keloids ([1-2]Wojarska et al. 2026). Recurrence rates following surgical excision alone range from 45-100% ([1]Wojarska et al. 2026; Casale & Tiralongo 2026). Postoperative radiation therapy following surgical excision has reported recurrence rates ranging from 3.1-55.2% ([1]Wojarska et al. 2026). Despite noted reductions in recurrence, there is a lack of consensus regarding the best method, total dosage, and fractionations to deliver radiation therapy. Additionally, there is a lack of high-quality published evidence regarding the use of radiation therapy as a treatment (alone or as an adjuvant therapy following surgical excision) in the pediatric population, mainly due to concerns stemming from potential radiation-induced malignancy or growth disturbances (Hu et al. 2026). Additional large, high-quality studies are also needed to determine the efficacy of “multi-therapy” treatment plans (e.g., surgical excision combined with radiation therapy and 5-fluorouracil) as some studies suggest there may be added benefit of combining radiation therapy with other treatments.

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Systematic Reviews and Meta-Analyses

Hu et al. (2026) published a case series with systematic review to assess the clinical outcomes of postoperative radiation therapy for recurrent pediatric keloids. The case series consisted of a retrospective review of all children treated with surgical excision and postoperative radiation for keloids at Children's Hospital of Philadelphia from 2000-2024. A total of 5 studies met inclusion criteria for systematic review. A total of 60 pediatric patients (retrospective institutional cohort and systematic review) were included in analysis. A total of 85 keloid lesions were treated across all patients. Mean age was 14.4±3.5 years, 11 (18.3%) were male, 12 (20.0%) were female, and sex was not reported in 37 (61.7%) patients. The earlobe was the most common keloid location (n = 23, 38.3%). Other keloid locations included the helix (n = 4), retroauricular (n = 4), preauricular (n = 1), back (n = 1), jaw (n = 1), and sternum (n = 1). Location was not reported for 28 lesions. Mean lesion size was 5.1±3.7 cm. Approximately 44 patients (73.3%) had a history of at least one prior surgery for keloid treatment at the same location being treated in the present study. Radiation therapy consisted of external beam techniques (n = 28 lesions, 46.7%) or brachytherapy (n = 32 lesions, 53.3%). Mean time to postoperative radiation was 0.8±0.6 days. The most common radiation dose was 12 Gy delivered in 3 fractions (n = 28, 46.7%). Other radiation doses consisted of 20 Gy in 5 fractions (n = 7, 11.7%), 10-12.5 Gy in 2 fractions (n = 7, 11.7%), 20 Gy in 3 fractions (n = 4, 6.7%), 12 Gy in 2 fractions (n = 3, 5.0%), 14 Gy in 2 fractions (n = 1, 1.7%), and 12 Gy in 1 fraction (n = 1, 1.7%). The radiation dose was not reported for 9 lesions. Additional adjunctive therapies were used, including steroid injections (n = 13 patients), compression therapy (n = 12 patients), and 5-fluorouracil (n = 1 patient). Mean follow-up was 32.3±24.0 months with a range from 1-120 months. Recurrence occurred in 19 (22.4%) keloids with an institutional recurrence rate of 3/18 lesions (16.7%). Higher recurrence rates were noted in cohorts that lacked an adjunctive therapy, although there was no statistical significance (25.4% vs. 13.6%, $p > 0.05$). Hyperpigmentation was the most common adverse event, occurring in 32 patients (53.3%). Transient pruritis occurred in 9 patients (15.0%), hypertrophic scarring in 8 patients (11.7%), and hypopigmentation in 6 patients (10.0%). Four patients (6.7%) had a Vancouver Scar Scale score ≥ 5. No instances of radiation-induced malignancy or growth disturbances occurred across all follow-up periods in all studies.

[1]Wojarska et al. (2026) completed a systematic review of 21 studies to assess the effectiveness of surgical excision combined with adjuvant physical and pharmacological therapies with a focus on recurrence rates. There was a total of 8627 participants across all included studies and adjuvant therapies included brachytherapy (n = 4 studies, 3927 participants), radiotherapy (n = 10 studies, 2941 participants), electron beam radiation therapy (n = 3 studies, 3130 participants), compression therapy (n = 2 studies), and pharmacological methods. Brachytherapy was generally applied within 24 hours of surgical excision in included studies with one study reporting a recurrence rate of 3.1% in 43 participants and three studies reporting recurrence rates of 9.7-15% in 3884 participants. Radiotherapy was generally applied within 72 hours of excision with reported recurrence rates ranging from 14-29.3%. One study focusing on radiotherapy assessed triple therapy (radiotherapy and surgical excision combined with either hyperbaric oxygen therapy, pressure therapy, platelet-rich plasma, or 5-Fluorouracil) reported a recurrence rate of 11.2%. Electron beam radiation therapy (EBRT) was generally applied within 24-72 hours post-surgical excision with recurrence rates ranging from 11-28.4%. One study focused on EBRT assessed recurrence rates for nonauricular sites (16%) and auricular sites (11%) with EBRT applied at 72 hours post-excision. 5-Fluorouracil was assessed in three studies with most administrations beginning immediately following surgery and continuing as part of a repeated injection protocol. No recurrences were reported in the included studies; however, "one study described a reduction in recurrence rates from 87% to 32% compared to surgical excision alone." Triamcinolone was assessed in seven studies and was mostly administered within 7-30 days post-excision. Two studies assessed the intraoperative injection of triamcinolone, and two studies assessed repeated injections at intervals of 14-90 days. Recurrence rates across all triamcinolone studies varied from 6.6-33%. One study assessed the administration of imiquimod 5% in 77 participants over the age of 12 years. Imiquimod 5% was administered topically either immediately after surgery or up to 7 days post-excision. The reported recurrence rate for imiquimod 5% was 39%. Follow-up periods across all studies varied from 3-6 months to 16 years with only two studies having a follow-up period less than 12 months. Most studies did not specify the surgical techniques used for excision. Authors concluded that "no definitive gold-standard treatment has been established that reliably eliminates keloids without recurrence. Surgical treatment continues to be regarded as a promising modality, as it provides immediate relief from discomfort such as pain and pruritus; however, when used as monotherapy recurrence rates range from 45% to 100%, underscoring the necessity of adjuvant treatment strategies." Radiation therapy can be considered a valuable therapeutic option, but there is a lack of consensus on the best timeframe to initiate therapy. Limitations of the review included a lack of description regarding surgical techniques and heterogeneity in results and follow-up periods limiting the ability to complete statistical evaluation.

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[2]Wojarska et al. (2026) conducted a systematic review of 22 studies published between January 2013 and July 2024 "to synthesize current evidence regarding radiation dose, fractionation protocols, associated adverse effects, proposed mechanisms of action, and reported recurrence rates" for adjuvant radiation therapy following surgical excision of keloids. There was a total of 2219 participants with 2227 treated keloids. Reported total doses of radiotherapy ranged from 8-24 Gy. Two studies used 8 Gy that was administered in a single fraction. One study administered a total of 24 Gy in 3 fractions of 8 Gy each. Four studies assessed total doses ≥ 20 Gy administered in 3-5 fractions. The most common total dosage was 12-18 Gy applied in 1-6 fractions. The most common fractionation scheme was 3 or 4 fractions. The most common dose per fraction for a 3 fraction scheme was 5-6 Gy. The most common dose per fraction for a 4 fraction scheme was 3-5 Gy and doses were generally applied daily. EBRT was the most common radiotherapy method. The lowest reported recurrence rate was 1.6% and was observed in a study that used a dose of 20 Gy in 5 fractions over 4 days using post-excision EBRT. The highest recurrence rate was 55.2% and occurred in a study using a total dose of 9 Gy using post-excision EBRT. Most studies reported recurrence rates < 30%. Recurrence rates were categorized with 2 studies reporting rates ≤ 5%, 8 studies reporting rates > 5 to ≤ 10%, 6 studies reporting rates > 10% and ≤ 20%, 3 studies reporting rates > 20% and ≤ 30%, and 3 studies reporting rates > 30%. One study included in the review compared higher dose (20 Gy) to lower dose (< 20 Gy) radiotherapy with lower recurrence rates being observed in participants receiving the higher dose. However, no formal statistical comparisons could be conducted due to heterogeneity between studies.

Osteoarthritis

There is an overall lack of high-quality evidence to support the use of LDRT as a treatment option for osteoarthritis in any joint. Additionally, authors of several studies concluded that there was no observed substantial benefit provided by LDRT compared to sham treatment. An RCT conducted by Mahler et al. (2018) comparing LDRT to sham intervention in patients with knee osteoarthritis and an RCT conducted by Minten et al. (2018) comparing LDRT to sham intervention in patients with hand osteoarthritis both concluded that LDRT provided no substantial beneficial effects and was not recommended as a treatment option by the authors. The results of an RCT conducted by Fazilat-Panah et al. (2025) contradict the results of Mahler et al. (2018); however, it is worth noting that the study conducted by Mahler et al. used a higher total dosage of LDRT compared to the Fazilat-Panah et al. study. A systematic review with meta-analysis conducted by Hammadeh et al. (2025) found that there was no statistically significant effect observed in pooled analysis and LDRT was associated with increased nail reactions when used to treat hand osteoarthritis. There are several clinical practice guidelines published for the treatment of osteoarthritis; however, none of those guidelines address the use of radiation therapy as a treatment option for osteoarthritis.

Randomized Controlled Trials

Fazilat-Panah et al. (2025) conducted a double-blind, sham-controlled RCT to assess the efficacy of LDRT for the treatment of knee osteoarthritis. Inclusion criteria included age ≥ 65 years with a diagnosis of knee osteoarthritis confirmed by a rheumatologist. Those who had a "history of lower limb radiation therapy due to any reason and with radiation interruption of at least two fractions were excluded from the study." A total of 60 participants were enrolled with 30 participants in each group. Pain intensity and functional outcomes were assessed using visual analog scores (VAS) and Lysholm-100 scores. All participants in both groups were examined by one rheumatologist that was blinded to the groups. Participants were examined before treatment and then monthly for six months following treatment completion. Participants receiving LDRT received a total of 3 Gy via photon beam in fractions of 0.5 Gy for six consecutive days. Those in the "control arm were simulated to undergo both CT scan and radiation therapy but none were exposed to x-ray." The mean age of participants was 76.77±3.86 years (range 72-89 years). Demographics and clinical histories were not statistically different between groups. At baseline, VAS and Lysholm-100 scores were not statistically different between groups (mean rank of VAS: placebo = 32.63 vs. intervention = 28.37, p = 0.25; mean rank of Lysholm-100: placebo = 27.43 vs. intervention = 33.57, p = 0.06). At the one-month post-treatment follow-up visit, VAS and Lysholm-100 scores increased from baseline for the placebo group (mean rank of VAS = 40.33; mean rank of Lysholm-100 = 38.00). A decrease in VAS and Lysholm-100 scores were noted compared to baseline for the intervention group (mean rank of VAS = 20.67; mean rank of Lysholm-100 = 23.00). The changes in scores from baseline were consistent over all follow-up periods (e.g., the increase or decrease in scores continued across all periods) and the difference between groups was significant (p < 0.001) for each follow-up period. The authors highlighted that the increases in VAS and Lysholm-100 scores in the placebo group showed the natural progression of osteoarthritis over time. Additionally, significant increases in the mean rank of daily intake of pain-relief medications were noted in the placebo group (mean rank at baseline = 3.84; mean rank at 6-months = 4.84) while the mean rank of pain-relief medications significantly decreased in the treatment group (mean rank at baseline = 6.18; mean rank at 6-months = 2.27). Functional status remained relatively stable from baseline to 6-month assessment in the placebo

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group while improvements were noted across all follow-up periods in the treatment group. Authors noted a major limitation of the study was the short duration of the study as it provided no long-term observation of potential long-term risks, particularly delayed radiation-related side effects. Other limitations of this study included a small sample size, a focus on only knee osteoarthritis, and the predominantly older population of this study limiting generalizability to other populations and joints.

Systematic Reviews and Meta-Analyses

Hammadeh et al. (2025) completed a systematic review and meta-analysis to assess the safety and efficacy of LDRT for the treatment of osteoarthritis. Studies were included if they evaluated the safety or efficacy of LDRT for pain management or reported specific pain-related or functional outcomes in human participants with a clinical diagnosis of osteoarthritis in any joint. The systematic review included 12 studies with a total of 1750 participants. The joints assessed in the studies primarily included the knee, hand, distal and proximal interphalangeal, fingers, and hip. Eight of the studies were included in the meta-analysis. Mean time since osteoarthritis diagnosis ranged from 9.8-11.1 years across all studies. Treatment doses of LDRT varied across studies from 0.5-3 Gy fractions with most studies delivering a total of 6 fractions over 2 weeks. Follow-up ranged from 6-24 months. The effect of LDRT on pain outcomes was reported in four studies (LDRT = 194 participants, sham = 196 participants) with pooled analysis showing no statistically significant difference between groups (SMD = -0.92, 95% CI = -2.14 to 0.29). Functional outcomes were reported in three studies (LDRT = 86 participants, sham = 85 participants) with pooled analysis showing no statistically significant difference between groups (SMD = 0.22, 95% CI -0.13 to 0.56). Adverse events were reported in three studies (LDRT = 355 participants, sham = 364 participants) with pooled analysis showing no statistically significant difference between groups for skin rash, fatigue, or serious adverse events when analyzed individually. Nail reaction was the only statistically significant adverse event when analyzed individually (RR = 2.24, 95% CI, p = 0.02). Pooled analysis of all adverse events showed a statistically significant difference between groups with a higher rate of adverse events in the LDRT group (RR = 1.44, 95% CI 1.08-1.92, p = 0.01). The number of treatment responders was reported in two studies (LDRT = 68 participants, sham = 61 participants). Subgroup analysis at 1, 2, 3, 6, and 12 months showed no statistically significant difference between groups for treatment responders. Overall pooled analysis for treatment responders also showed no statistically significant difference between groups. Authors concluded that LDRT showed no statistically significant impact when compared to sham treatment. Limitations of the study included the impact of variations in joint sites, severity of osteoarthritis, and LDRT dosing regimens on pooled estimates. Additional limitations include a small number of trials included for analysis, a lack of standardized follow-up across studies, and the significant variations of estimates when analyzing across multiple joint locations.

Plantar Fasciitis

There is an overall lack of high-quality evidence to support the use of LDRT for the treatment of plantar fasciitis-related pain. Most of the published evidence involves relatively small groups of participants and an overall lack of long-term follow-up (e.g., ≥ 2 years). The lack of long-term follow-up creates concerns regarding “the theoretical possibility of late-onset hematopoietic malignancy (Buchbinder 2026).” There are several observational studies (e.g, Novo-Rigueiro et al. 2026) that lack a relevant control group, limiting generalizability of study findings. Additionally, a study by Prokein et al. (2017) comparing doses (e.g, 0.5 Gy vs. 1.0 Gy) found that several participants required re-irradiation with the “standard” dose (e.g., 1.0 Gy) after the predefined observation time regardless of the initial dosage received, indicating that re-irradiation may be needed to achieve a beneficial effect. This effect was observed in other studies comparing doses (Ott et al. 2014).

Randomized Controlled Trials

Novo-Rigueiro et al. (2026) conducted a longitudinal observational study involving 68 participants with MRI-confirmed refractory chronic plantar fasciitis that remained symptomatic despite conservative treatment and extracorporeal shockwave therapy. Inclusion criteria were age ≥ 18 years, plantar heel pain ≥ 6 months duration, documented failure of conservative treatment, diagnosis confirmed by MRI, and persistent clinically relevant pain leading to indication of LDRT. Exclusion criteria were a previous surgery directly related to plantar fascia release or surgery considered responsible for current plantar pain syndrome, concomitant conditions that could explain plantar pain, or contraindications to radiotherapy. All participants received LDRT with a total dose of 3 Gy in 6 fractions of 0.5 Gy. Outcomes assessed included VAS, foot function index (FFI), and EuroQol-5D (EQ-5D) at baseline and at 1, 3, 6, 12, and 24 months. MRI was performed at baseline and at 3 and/or 6 months post-treatment with LDRT. LDRT was administered by the same center/radiation oncologist, and all clinical/functional assessments were performed by the same specialist to reduce intraobserver variability. Mean age was 52.6±11.2 years and most participants were female (72.1%). Comorbidities included hypothyroidism (27.9%), diabetes mellitus (17.6%), and hypertension (17.6%).

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Approximately 48.5% of participants had previously received corticosteroid injections. Baseline pain/functional impairment was severe (mean VAS 8.38±0.65, mean FFI 194.75±19.64). Significant decreases in VAS scores from baseline to 1-month follow-up were observed with sustained improvement over time. Significant decreases in FFI scores were observed "with clinically meaningful improvements observed as early as the first month and maintained throughout the entire follow-up period." Significant improvements were observed in EQ-5D scores (particularly mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) with the greatest changes observed in the first 6-months post-treatment. Approximately 95.6% of participants met the established clinical response criteria at 6 months with 98.5% of patients also showing meaningful clinical improvement and 92.6% showing improvement in health-related quality of life. "At 3 months, 91.2% of patients achieved a good clinical response, defined as a VAS reduction ≥ 4 points or a final VAS ≤3 points, while 27.9% achieved an excellent response, defined as a final VAS ≤1 point. Sustained good response rates remained stable during long-term follow-up, reaching 85.1% at 6, 12, and 24 months. Excellent response rates increased over time, reaching 35.8% during long-term follow-up." No consistent baseline predictors of clinical response were identified. One patient experienced worsening of pre-existing bilateral foot paresthesia and increased episodes of epistaxis, though both symptoms were present before treatment. Researchers noted that “although MRI showed improvement in selected structural and inflammatory-related findings in a subset of patients, several individuals achieved marked clinical improvement despite persistent imaging abnormalities.” Limitations included a lack of a control group, the study was a single-center observational study, a potential of selection bias due to the absence of randomization, follow-up MRI exams were only completed in a subgroup of patients and MRI assessments were not formally blinded to examination timing, and there were a small number of non-responders that could have influenced predictors of response.

Prokein et al. (2017) reported the 48-week follow-up results of a multicenter trial comparing delivery of a total dose of 6 Gy administered in fractions of 0.5 Gy or 1.0 Gy. Those receiving 6 fractions of 1 Gy (standard dose) received therapy two times per week and those receiving 12 fractions of 0.5 Gy (experimental group) received therapy three times per week. The initial study included 127 participants with 101 being available for evaluation at the 48-week follow-up (standard = 52, experimental = 49). Those not responding to experimental therapy after 12 weeks were offered re-irradiation with the standard dose. The primary endpoints included pain relief (VAS, Calcaneodynia Score) and quality of life (SF-12). Follow-up exams were conducted every 6 weeks in clinic or by mail. The mean difference in VAS from baseline to 48-weeks was not statistically significant between groups (standard = 59.4, experimental = 61.6, p = 1.0). The mean difference in Calcaneodynia scores from baseline to 48-weeks was also not statistically significant between groups (standard = +40.1, experimental = +40.4, p = 0.679). Regarding quality of life (SF-12), only the doctor's judgement on the psychic scale was significantly different (p = 0.038) from baseline to 48-week follow-up. At 12 weeks, VAS decreased by 14.8 points in the standard group compared to 16.6 points in the experimental group (p = 0.744). Approximately 28 participants required re-irradiation (standard = 15, experimental = 13). Of the 28 requiring re-irradiation, 24 could be evaluated for 48-week follow-up. At 48-week follow-up, "patients who had undergone re-irradiation experienced an insignificant difference concerning pain relief compared with patients who showed a good response to radiation therapy from the beginning." Additionally, those undergoing re-irradiation saw a significant decrease in VAS (-28.5, p < 0.001) and a significant increase in Calcaneodynia scores (+24.3, p < 0.001) when comparing 12-week follow-up to 48-week follow-up. "The results concerning [quality of life] showed statistically significant benefits for patients with re-irradiation concerning the somatic scale but not the psychic scale." Authors concluded there was no statistically significant differences after 48 weeks follow-up concerning pain relief. There were also no statistically significant differences in quality-of-life scores except for the doctor's judgement on the psychic scale. However, authors were unable to explain the difference for doctor's judgement. Limitations included the relatively small study population, the enrollment goal of the study could not be met, "the use of analgesics was not limited before or during the follow-up, which may have confounded the results", the trial was not blinded for patients or physicians, and researchers "got the impression that...the evaluation of patients was influenced by emotional events and therefore did not exclusively reflect the evaluated parameter itself."

National and Specialty Organizations

The **American Academy of Ophthalmology (AAO)** published the *Orbital Radiation for Thyroid Eye Disease: A Report by the American Academy of Ophthalmology* (Sobel et al. 2022). The AAO ophthalmic technology assessment committee reviewed available literature to determine the safety and efficacy of orbital radiation for the treatment of thyroid eye disease. The AAO reached the following conclusions:

- “Both large and small studies demonstrated that orbital radiation therapy, with or without corticosteroid therapy, may improve motility, diplopia, and symptoms or signs of clinical activity.

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- Standard radiation treatment involves 20 Gy in 10 fractions. Lower dosing seems to improve motility less than higher dosing, but clinical activity improves regardless.
- Radiation therapy may be a reliable technique for treating or preventing compressive optic neuropathy.
- Radiation therapy may facilitate tapering of steroids.
- Minor side effects, such as dry eye and cataract, are more common than major ones, but longer follow-up is necessary to surveil properly for radiation retinopathy or malignancy."

The **German Society for Radiation Oncology (DEGRO)** published updated guidelines for *Radiotherapy for Benign Diseases* (Mücke et al. 2022). The guidelines make the following recommendations specific to the indications addressed in this policy:

- For osteoarthritis of the small joints: Radiotherapy can be performed if indicated. Single dose: 0.5-1 Gy, total dose: 3-6 Gy. Evidence level 4, recommendation level C.
- For osteoarthritis of the knee (gonarthrosis): Radiotherapy can be performed if indicated. Single dose: 0.5-1 Gy, total dose: 3-6 Gy. Evidence level 2c, recommendation level C.
- For osteoarthritis of the hip (coxarthrosis): Radiotherapy can be performed if indicated. Single dose: 0.5-1 Gy, total dose: 3-6 Gy. Evidence level 4, recommendation level C.
- For plantar fasciitis/heel pain: "Indications are a painful heel spur with a history of more than 3 months. Patients under age 40 years should not be irradiated as a rule. Patients between 30 and 40 years of age may be irradiated if all conservative methods have been exhausted and were unsuccessful. Clinical and radiological evidence of calcaneal spur should be required. The indication for radiotherapy is the presence of appropriate symptoms and clinical and imaging evidence. Radiation with a total reference dose of 3.0–6.0 Gy with single fractions of 0.5–1.0 Gy, 2-3 times per week, is recommended." Evidence level 1b, recommendation level A.
- For keloids: "Therapy by irradiation of keloids as monotherapy may be recommended in individual cases when other measures cannot be considered. Radiation postoperatively for prophylaxis of *de novo* development of hypertrophic scars or keloids in high-risk/predisposed patients is not recommended. Radiotherapy after surgical therapy for keloid recurrence can be performed." Single dose: 3 Gy, total dose: 12 Gy. Evidence level 4, recommendation level C.
- For heterotopic ossification (endoprosthetic hip replacement with removal of heterotopic ossification): "All patients with endoprosthetic hip replacement needing removal of heterotopic ossification should be treated prophylactically with NSAIDs or radiotherapy. Radiotherapy should be applied within the time window of up to 4 hours before surgery or up to 72 hours after surgery. A single dose of 7-8 Gy should be applied, except in high-risk cases, which call for postoperative fractionated radiotherapy at 5×3.5 Gy." Evidence level 1, recommendation level A.
- For heterotopic ossification (other fractures near the joint): Radiotherapy should be performed. Evidence level 2, recommendation level B.
- For Graves ophthalmopathy (referred to as endocrine orbitopathy in the document): "Antiproliferative percutaneous radiotherapy for endocrine orbitopathy should be performed, when ocular muscle dysfunction is manifest. In the early inflammatory phase, a single dose of 0.3–2.0 Gy can be used with eight fractions and daily irradiation, for a total dose of 2.4–16 Gy. In advanced disease, the single dose should be 2.0 Gy with 8–10 fractions and daily irradiation, for a total dose 16–20 Gy. In cases of pronounced ophthalmologic symptoms, it may be possible to improve the response to therapy by lowering the single dose to 1 Gy and prolonging the therapy period by irradiation only once a week." Evidence level 2, recommendation level B.

The **European Group on Graves' Orbitopathy (EUGOGO)** published *Clinical Practice Guidelines for the Medical Management of Graves' Orbitopathy* (Bartalena et al. 2021). The guidelines state "orbital radiotherapy is considered an effective second-line treatment for moderate-to-severe and active [Graves' orbitopathy], in combination with glucocorticoids, particularly in the presence of diplopia and/or restriction of extraocular motility" (strength of recommendation 1, level of evidence 3). Additionally, "based on expert opinion only (as randomized trials are not available), the task force suggests combination of orbital radiotherapy and IV methylprednisolone as a potential second-line treatment for moderate-to-severe and active [Graves' orbitopathy]" (strength of recommendation 2, level of evidence 2). The guidelines also make additional recommendations for the early referral to specialized centers for individuals with risk factors of Graves' orbitopathy.

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CODING & BILLING INFORMATION

CPT (Current Procedural Terminology)

Code	Description
77387	Guidance for localization of target volume for delivery of radiation treatment, includes intrafraction tracking, when performed
77402	Radiation treatment delivery; Level 1 (e.g., single-electron field, multiple-electron fields, single isocenter 2D photons), including imaging guidance, when performed
77407	Radiation treatment delivery; Level 2, single-isocenter (e.g., 3D or IMRT), photons, including imaging guidance, when performed
77412	Radiation treatment delivery; Level 3, multiple isocenters with photon therapy (e.g., 2D, 3D, or IMRT) or a single-isocenter photon therapy (e.g., 3D or IMRT) with active motion management, or total skin electrons, or mixed-electron/photon field(s), including imaging guidance, when performed
77427	Radiation treatment management, 5 treatments
77431	Radiation therapy management with complete course of therapy consisting of 1 or 2 fractions only
77436	Surface radiation therapy; superficial or orthovoltage, treatment planning and simulation-aided field setting
77437	Surface radiation therapy; superficial, delivery, <=150 kV, per fraction (e.g., electronic brachytherapy)
77438	Surface radiation therapy; orthovoltage, delivery, >150-500 kV, per fraction
77439	Surface radiation therapy; superficial or orthovoltage, image guidance, ultrasound for placement of radiation therapy fields for treatment of cutaneous tumors, per course of treatment (List separately in addition to code for primary procedure)

CODING DISCLAIMER: Codes listed in this policy are for reference purposes only and may not be all-inclusive. Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement. Listing of a service or device code in this policy does not guarantee coverage. Coverage is determined by the benefit document. Molina adheres to Current Procedural Terminology (CPT®), a registered trademark of the American Medical Association (AMA). All CPT codes and descriptions are copyrighted by the AMA; this information is included for informational purposes only. Providers and facilities are expected to utilize industry standard coding practices for all submissions. When improper billing and coding is not followed, Molina has the right to reject/deny the claim and recover claim payment(s). Due to changing industry practices, Molina reserves the right to revise this policy as needed.

APPROVAL HISTORY

10/21/2026 New policy. IRO peer reviewed on October 2, 2026, by a practicing physician board certified in Radiation Oncology.

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