# Molina Clinical Policy
# Fractional CO2 Laser Treatment for Traumatic and Burn Scars
# Policy No. 443

**Last Approval: 08/12/2026**
**Next Review Due By: August 2027**

## DISCLAIMER

This Molina Clinical Policy (MCP) is intended to facilitate the Utilization Management process. Policies are not a supplementation or recommendation for treatment; Providers are solely responsible for the diagnosis, treatment, and clinical recommendations for the Member. It expresses Molina's determination as to whether certain services or supplies are medically necessary, experimental, investigational, or cosmetic for purposes of determining appropriateness of payment. The conclusion that a particular service or supply is medically necessary does not constitute a representation or warranty that this service or supply is covered (e.g., will be paid for by Molina) for a particular Member. The Member's benefit plan determines coverage – each benefit plan defines which services are covered, which are excluded, and which are subject to dollar caps or other limits. Members and their Providers will need to consult the Member's benefit plan to determine if there are any exclusion(s) or other benefit limitations applicable to this service or supply. If there is a discrepancy between this policy and a Member's plan of benefits, the benefits plan will govern. In addition, coverage may be mandated by applicable legal requirements of a State, the Federal government or CMS for Medicare and Medicaid Members. CMS's Coverage Database can be found on the CMS website. The coverage directive(s) and criteria from an existing National Coverage Determination (NCD) or Local Coverage Determination (LCD) will supersede the contents of this MCP and provide the directive for all Medicare members. References included were accurate at the time of policy approval and publication.

## OVERVIEW

**Hypertrophic scars** are pathological scars resulting from chronic inflammation and excessive collagen production in the healing phase of wounds that penetrate the dermis. Risk factors for hypertrophic scarring include mechanical stretching forces around the wound bed, inflammation, dysregulated wound healing process, genetics, age, and hypertension (Ogawa 2026). The most common injuries that result in hypertrophic scars are burns, traumatic wounds, and surgical sites. Burn injuries alone account for approximately 40,000 hospitalized patients and 486,000 patients seeking medical attention annually in the United States (van Baar 2020). Hypertrophic scars stay confined to the original wound's borders, unlike keloid scars that extend beyond the original wound bed. Hypertrophic scars are raised, firm, erythematous, and can feel painful, itchy, and tight. Fragile scar tissue can be susceptible to tears and blisters, increasing the risk of infection, and the decreased pliability and/or elasticity in the skin can result in contractures that reduce range of motion and mobility, leading to functional impairment. Scarring can also cause permanent disfigurement which, in addition to functional impairment, can greatly decrease a person's quality of life.

Conventional scar treatment consists of topical or injectable corticosteroids, compression therapy, silicone gel, and silicone or non-silicone gel sheeting. These treatments target small non-contractured hypertrophic scars and are employed with the goal to reduce inflammation and tension on the scar tissue; however, compression therapy and gel sheeting have limited high-quality evidence attesting to their efficacy. Surgical techniques such as Z-plasty, W-plasty, skin grafts, or local skin flaps are employed when contractures develop; however, these techniques are associated with high recurrence rates and morbidity (Ogawa 2026).

**Fractional carbon dioxide laser treatment ($FCO_2LT$)** is a dermatological surgical procedure utilizing a laser that targets microscopic columns of the skin in the epidermal and dermal layers to induce therapeutic thermal injury, which stimulates wound healing and collagen remodeling. The skin surrounding these microscopic columns is spared and acts as an anchor to aid in the healing process (Hayes 2026; Hultman & Yoshida 2026).

Fractional laser treatment can be ablative, in which the epidermal layer is removed, or non-ablative, where collagen remodeling is stimulated in the dermal layer with the epidermis remaining intact. Fractional $CO_2$ and erbium-doped yttrium aluminum garnet (Er:YAG) lasers are inherently ablative and are the primary laser types used to treat hypertrophic scars (Hultman & Yoshida 2026). Some treatment modalities combine a fractional $CO_2$ laser with separate non-ablative laser wavelengths (Avdulaj et al. 2025). $FCO_2LT$ is typically administered in an outpatient setting under general or local anesthesia. Healing time takes one to three weeks post treatment, and multiple treatments may be required (Hayes 2026).

### Regulation Status

The FDA has cleared several fractional lasers through the 510(k) premarket notification process under product codes GEX for powered laser surgical instruments, and ONG for powered laser surgical instruments with microbeam/fractional output. There are various types of lasers used, either ablative or non-ablative. Examples of lasers used in $FCO_2LT$ are the UltraPulse systems (Lumenis Be, Ltd.) and the Syneron $CO_2RE$ system (Candela Corp).

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## COVERAGE POLICY

Fractional carbon dioxide laser treatment ($FCO_2LT$) for the treatment of hypertrophic trauma and burn scars may be **considered medically necessary** when ALL the following criteria are met:

1. Member has a permanent hypertrophic scar resulting from trauma or a burn
2. Documented evidence that the hypertrophic scar results in functional impairment
3. Member has employed at least one conventional non-invasive scar treatment method (including, but not limited to silicone or non-silicone gel sheeting, pressure garments, and/or steroid injections) without satisfactory results
4. Absence of ALL the following contraindications:
   a. Open wounds and/or active acne lesions at or around treatment site
   b. Active infection at or around the treatment site
   c. Prior radiation therapy to treatment site

### Limitations and Exclusions

1. Medically necessary $FCO_2LT$ for the treatment of hypertrophic trauma and burn scars is limited to 6 treatment sessions
2. The following indications for fractional laser treatment are considered **experimental, investigational, and unproven** based on insufficient evidence:
   a. Erbium:YAG and Nd:YAG lasers for the treatment of hypertrophic trauma and burn scars with functional impairment
   b. Fractional laser treatment for the treatment of keloid scars
3. The following indications for fractional laser treatment are considered **NOT medically necessary:**
   a. Scar revision in the absence of functional impairment
   b. Cosmetic procedures, including but not limited to, acne management, skin rejuvenation, and/or tattoo removal

**DOCUMENTATION REQUIREMENTS.** Molina Healthcare reserves the right to require that additional documentation be made available as part of its coverage determination; quality improvement; and fraud; waste and abuse prevention processes. Documentation required may include, but is not limited to, patient records, test results and credentials of the provider ordering or performing a drug or service. Molina Healthcare may deny reimbursement or take additional appropriate action if the documentation provided does not support the initial determination that the drugs or services were medically necessary, not investigational, or experimental, and otherwise within the scope of benefits afforded to the member, and/or the documentation demonstrates a pattern of billing or other practice that is inappropriate or excessive.

## SUMMARY OF MEDICAL EVIDENCE

***Randomized Controlled Trials***

Younes et al. (2025) conducted a prospective, randomized, single blind comparative trial to evaluate the efficacy of fractional carbon dioxide laser treatment ($FCO_2LT$) alone and in combination with topical triamcinolone acetonide or 5-fluorouracil in the treatment of early post burn hypertrophic scars. The study enrolled 30 patients aged 16 to 65 years with untreated hypertrophic scars developing within six months of burn injury. Participants were randomized into three groups. Group A received fractional $FCO_2LT$ alone, Group B receive fractional $FCO_2LT$ combined with topical 5-fluorouracil and Group C receive fractional $FCO_2LT$ combined with topical triamcinolone acetonide. All three groups demonstrated statistically significant improvements ($P < 0.05$) in overall scar severity and height. Group C showed notable improvements in scar pliability, height, and pigmentation, while group B exhibited significant reduction in vascularity, pliability, and height. Although both combination therapies were effective, no statistically significant difference was observed between the efficacy of triamcinolone and 5-fluorouracil. Minor changes in pain and itching were reported across groups, but these were not statistically different between the combination arms. The authors

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concluded that $FCO_2LT$ either alone or in combination with topical agents offers a clinically meaningful benefit in the early management of post burn hypertrophic scars. The study supports the use of fractional $FCO_2LT$ is a safe and effective modality for improving scar characteristics such as thickness, playability, and pigmentation.

Won et al. (2023) conducted a prospective randomized split scar trial to assess the safety and efficacy of low energy $FCO_2LT$ on early-stage pediatric hypertrophic scars. Twenty participants under the age of 12 completed the study. Each participant's scar was split into three zones: one edge was the treatment zone, the middle of the scar was a transition zone and was not included in the results, and the other edge was the control zone that did not receive laser therapy. The primary outcome was a reduction in the Patient and Observer Scar Assessment Scale (POSAS), with a secondary outcome of procedure pain evaluation using the Visual Analogue Scale. The participants underwent three laser therapy treatments at 1-month intervals. The total POSAS score at the 6-month follow-up was significantly lower for the treated site (44.95 for the treated group vs. 64.85 for the control group, $p < 0.0001$). No significant difference was found in patient score of irregularity. The average pain rating on the Visual Analogue Scale was 3.5 ± 1.43 out of 10 after each procedure. The results led the authors to conclude low energy $FCO_2LT$ is a viable therapy in pediatric hypertrophic scars, as it improves scar outcomes with less procedural pain than higher energy laser treatments.

***Systematic Reviews and Meta-Analyses***

Abi Zeid Daou et al. (2025) conducted a systematic review and meta-analysis to evaluate the effectiveness of $FCO_2LT$, as monotherapy, for treating hypertrophic scars and keloids compared to other laser treatments. Seven studies met inclusion criteria, which included prospective comparative trials and one large retrospective study, for a total of 506 scars in 404 adult patients. Comparative laser treatments included pulsed dye laser (PDL), neodymium-doped yttrium aluminum garnet (Nd:YAG) laser, and erbium-doped yttrium aluminum garnet (Er:YAG) laser. Primary outcomes were measured with the Vancouver Scar Scale (VSS), assessing scar vascularity, pigmentation/color, pliability, and height, with lower scores indicating less severe scarring. Pooled analysis showed significantly lower mean VSS scores at the end of treatment with $FCO_2LT$ than with other lasers, with a mean difference of –0.31 (95% confidence interval [CI] –0.51 to –0.12, $p = 0.002$, $I^2 = 0\%$). $FCO_2LT$ also showed superior percentage improvement in VSS, but only after performing a "leave-one-out" analysis due to heterogeneity. Additionally, pooled analysis showed no significant differences in pigmentation/color, pliability, height, vascularity improvements, or patient satisfaction. For adverse events, the authors state that while most studies of $FCO_2LT$ show a favorable safety profile, frequent and significant side effects have been reported in some studies, including persistent erythema, post-inflammatory pigmentation changes, scarring, and ulceration. The authors concluded that $FCO_2LT$ is effective in the treatment of hypertrophic scars and keloids and may be superior to other lasers when used as monotherapy.

Choi et al. (2021) conducted a systematic review on the efficacy of $FCO_2LT$ in the treatment of burn scars. A total of 15 articles, which comprised of 3 RCTs (randomized controlled studies) and 12 observational studies, from the years 2012 to 2019. Sample sizes ranged from 10 to 320 for a combined 778 subjects. All studies analyzed used ablative $FCO_2LT$ with a median of 2.5 (IQR 4.3) treatments per subject, with a range of 1 to 3 months between treatments. The data was subjective with participants self-reporting a 97% satisfaction with $FCO_2LT$ in two studies, and a 76% self-reported resolution in scar pain and pruritis. There was a 95% reported improvement in scar thickness and pliability. The authors concluded that $FCO_2LT$ is a safe and effective procedure in the outpatient setting to improve burn scar symptoms.

Peng et al. (2021) conducted a meta-analysis on the safety and efficacy of $FCO_2LT$ in the treatment of burn scars. Twenty articles were included and weighted mean difference was conducted to combine the results, a random – effect model was used to pool the results, and publication bias was estimated with Begg and Egger's regression asymmetry test. The analysis revealed side effects from $FCO_2LT$ were mild and tolerable, with no major morbidity or mortality related to the procedure documented. The results also uncovered $FCO_2LT$ significantly improved the Vancouver Scar Scale (VSS) score (WMD = -3.24, 95%CI: -4.30, -2.18; P < 0.001), and reduced (POSAS)-patient (WMD = -14.05, 95%CI: -22.44, -5.65; P = 0.001) and Observer (WMD = -6.31, 95%CI: -8.48, -4.15; P < 0.001) scores as well. Upon ultrasonography measurement scar thickness was significantly reduced (WMD = -0.54, 95%CI: -0.97, -0.10; P < 0.001). Only the cutometer measure R2 (scar elasticity) (WMD = -0.06, 95%CI: -0.10, -0.01; P = 0.023) was significantly improved with the laser therapy, but cutometer measures R0 (scar firmness) (WMD = 0.03, 95%CI: -0.04, 0.09; P = 0.482) was not. In conclusion $FCO_2LT$ significantly improved burn scar symptoms and morphology, however, the authors noted that due to significant heterogeneity among studies that more large-scale, well designed randomized controlled trials are needed to confirm these findings.

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Zhang et al. (2021) conducted a meta-analysis on the efficacy of $FCO_2LT$ for burn scars. A total of 14 studies were included and the outcomes compiled to analyze scar improvement were the POSAS and VSS. The results revealed scars treated with $FCO_2LT$ significantly improved VSS score (MD -3.01 [95% confidence interval (CI) -3.79, -2.22]; p < .00001), and reduced the POSAS score: POSAS Patient (MD -14.38 [95% CI -17.62, -11.13]; p < .000010; POSAS - Observer (MD -8.81 [9% CI -11.60, -6.02]; p < .00001) especially with regards to pigmentation, vascularity, pliability, and height of scar. Scar thickness measured with ultrasonography decreased non-significantly (MD -0.48 [95% CI -1.04, 0.09]; p = .1) whereas cutometer measures, R0 (scar firmness) and R2 (scar elasticity) did not change meaningfully. Patients also reported a reduction in scar pain and pruritis, leading the authors to conclude $FCO_2LT$ is a valuable tool in burn scar severity reduction.

***Non-Randomized Studies, Retrospective Reviews, and Other Evidence***

Hayes (2026) conducted a health technology assessment to evaluate the safety and effectiveness of fractional laser treatment for functional improvement in patients with hypertrophic and keloid burn and traumatic scars. Hayes concluded that there is an overall low body of evidence to suggest $FCO_2LT$ is a reasonably safe and effective treatment for functional improvement for patients with hypertrophic scarring from burns or trauma. However, substantial uncertainty exists due to lack of data on comparative effectiveness and safety. For fractional laser therapy types other than $FCO_2LT$, there is an insufficient body of evidence to support its safety and efficacy. For keloid scars, there is also insufficient evidence on safety and efficacy for any fractional laser modality. Hayes emphasized that it remains unclear whether fractional laser treatment consistently leads to clinically important improvements and whether it provides benefits beyond conventional scar care. Most studies are noncomparative and do not report on safety-related outcomes. More investigation is needed on laser media other than $FCO_2LT$ for functional improvement.

Radmanesh et al (2021) conducted a comparison study to evaluate the efficacy of pulsed dye laser (PDL) versus $FCO_2LT$ in the treatment of hypertrophic scars. Thirty–five participants were enrolled in the study. Depending on scar size and shape, either one hypertrophic scar was treated with PDL on one side and $FCO_2LT$ on the other, or two similar scars were chosen with PDL utilized on one scar and $FCO_2LT$ on the other. The settings used for $FCO_2LT$ were power = 30 W, pulse energy = 50 mJ, density = 200 spots/cm2 for three passes with coagulated tissue was wiped out before the next pass. The settings for pulsed dye laser therapy were 585 nm PDL were 9 J/cm2 with 5 mm spot size for two superimposed passes. Both procedures were repeated every month for 4 months. At the conclusion of the four sessions both sides showed remarkable improvement, but no meaningful difference was detected between two areas that were treated with PDL versus $FCO_2LT$ ($p > .05$). The mean VSS was 7.31 ± 1.93 in the beginning, and the final scores one month after the final session were 4.26 ± 1.48 for $FCO_2LT$ and 4.33 ± 1.70 for PDL.

Issler-Fisher et al. (2017) conducted a prospective study on ablative $FCO_2LT$ for burn scar reconstruction. Objective factors analyzed were the VSS, POSAS, and ultrasound measurements of scar thickness. Subjective factors analyzed were quality of life assessed via the Burns Specific Health Scale, neuropathic pain, and pruritus. For treatment effect analysis, patients were stratified according to scar maturation status (> or <2 years after injury). A total of 47 patients with 118 burn scars were included in this short-term study and all completed at least one treatment cycle. At a median of 55 days (IQR 32-74) post treatment all objective parameters decreased significantly: scar thickness decreased from a median of 2.4mm to 1.9mm ($p<0.001$) in addition to a reduction in the VSS score (from a median of 7 to 6 ($p<0.001$), and the POSAS observer score (POSAS-O; maximal score 60) decreased from a median of 29.0 to 21.0 ($p<0.001$, 47 individuals, 118 scars). Participants reported neuropathic pain and pruritis reduction, as well as a 15-point increase (median 120 to 135; $p<0.001$) on the Burns Specific Health Scale which correlates to a rise in quality of life. The results were equally significant across all scars, regardless of their maturity.

**National and Specialty Organizations**

Seago at al. (2020) published an international consensus guideline outlining expert recommendations for the use of laser therapy in managing traumatic scars and burn-related contractures. Fractional laser therapy, particularly ablative fractional lasers, were identified as a first-line treatment due to their ability to improve scar texture, pliability, thickness, and functional mobility. $FCO_2LT$ was found to be preferred over fractionated Er:YAG in the management of traumatic scars due to a better literature base, greater available penetration depth and thermal response, and wider availability. Non-ablative fractional lasers were also recommended, especially for early intervention, sensitive anatomical areas, or patients with darker skin types. Treatment initiation should occur once the wound is stable and epithelialized, with multiple sessions typically spaced 4 to 8 weeks apart. Fractional laser therapy is most effective when integrated into a multimodal care plan that may include compression garments, silicone gel sheets, physical therapy, corticosteroid

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injections, and psychosocial support. Device settings must be individualized based on scar characteristics, skin type, and patient tolerance, as no universal protocol currently exists. Clinical outcomes include reductions in pain, pruritus, scar height, and contracture severity, as well as improvements in range of motion and quality of life. The guideline emphasizes ongoing research to optimize laser combinations, timing, and long-term outcomes, with increasing focus on functional recovery and patient centered metrics. Despite growing clinical adoption, formal guidelines for medical associations remain limited and treatment protocols are largely informed by expert consensus and institutional experience.

## SUPPLEMENTAL INFORMATION

**Vancouver Scar Scale (VSS)**: Total Score Ranges from 0 – 13. Points assigned within parentheses.

1. Vascularity: Normal (0) Pink (1) Red (2) Purple (3)
2. Pigmentation: Normal (0) Hypopigmentation (1) Hyperpigmentation (2)
3. Pliability: Normal (0) Supple (1) Yielding (2) Firm (3) Ropes (4) Contracture (5)
4. Height (mm): Flat (0) < 2 (1) 2-5 (2) > 5 (3)

**Patient and Observer Scar Assessment Scale (POSAS)** is a two-part scoring system that incorporates both patient and observer scores. Each item is scored on a 10-point scale, with the score of 10 being the largest variation from normal skin. Both scores are added together to assign the scar a rating from 6 – 60 points.

1. Patient Scoring Categories: Pain, Thickness, Stiffness, Itch, Color, Irregularity
2. Observer Scoring Categories: Vascularity, Texture, Pliability, Pigmentation, Thickness, Surface Area

## CODING & BILLING INFORMATION

**CPT (Current Procedural Terminology)**

| Code | Description |
|---|---|
| **0479T** | Fractional ablative laser fenestration of burn and traumatic scars for functional improvement; first 100 cm2 or part thereof, or 1% of body surface area of infants and children |
| **0480T** | Fractional ablative laser fenestration of burn and traumatic scars for functional improvement; each additional 100 cm2, or each additional 1% of body surface area of infants and children, or part thereof (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

| | |
|---|---|
| **08/12/2026** | Policy reviewed. No changes to coverage criteria. |
| **10/08/2025** | Policy reviewed**.** No changes to coverage criteria. Updated Summary of Medical Evidence and References. |
| **04/09/2025** | Added 6 treatment limit stipulation to coverage criteria. Annual review will remain due in October 2025. |
| **10/09/2024** | Policy reviewed. No changes to coverage criteria. |
| **10/12/2023** | New Policy. IRO Peer Reviewed by a practicing physician board certified in dermatology October 2023. |

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