

<b>2.01.107</b>		<b>Fractional Carbon Dioxide (CO<sub>2</sub>) Laser Ablation Treatment of Hypertrophic Scars or Keloids for Functional Improvement</b>	
<b>Original Policy Date:</b>	April 1, 2024	<b>Effective Date:</b>	April 1, 2024
<b>Section:</b>	2.0 Medicine	<b>Page:</b>	Page 1 of 14

## Policy Statement

- I. Carbon dioxide (CO<sub>2</sub>) fractional laser ablation treatment of hypertrophic scars or keloids for functional improvement is considered **investigational**.

**NOTE:** Refer to [Appendix A](#) to see the policy statement changes (if any) from the previous version.

## Policy Guidelines

### Coding

The following CPT codes are specific to fractional ablative laser fenestration of burn and traumatic scars for functional improvement:

- 0479T: Fractional ablative laser fenestration of burn and traumatic scars for functional improvement; first 100 cm<sup>2</sup> 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 cm<sup>2</sup>, or each additional 1% of body surface area of infants and children, or part thereof (List separately in addition to code for primary procedure)

## Description

Hypertrophic scars and keloids are cutaneous lesions resulting from abnormal wound healing. There is no gold standard therapy for hypertrophic scars and keloids, and treatment frequently involves multiple techniques including pharmacotherapy, compression, surgery, radiation, and light sources. For scars and keloids impairing function, fractional carbon dioxide (CO<sub>2</sub>) ablative laser treatment is proposed to improve abnormal texture, thickness, and stiffness of scars by ablative destruction and resurfacing. The treatment may be used as monotherapy or in combination with other therapies (e.g., sequential treatment with other lasers, sequential treatment with other therapies, or laser-assisted drug delivery).

## Related Policies

- Electrostimulation and Electromagnetic Therapy for Treating Wounds
- Negative Pressure Wound Therapy in the Outpatient Setting
- Noncontact Ultrasound Treatment for Wounds

## Benefit Application

Benefit determinations should be based in all cases on the applicable contract language. To the extent there are any conflicts between these guidelines and the contract language, the contract language will control. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

Some state or federal mandates (e.g., Federal Employee Program [FEP]) prohibits plans from denying Food and Drug Administration (FDA)-approved technologies as investigational. In these instances, plans may have to consider the coverage eligibility of FDA-approved technologies on the basis of medical necessity alone.

## Regulatory Status

Multiple fractional CO2 laser systems have been approved by FDA through the 510(k) program. These devices have broad indications for dermatological procedures requiring ablation, resurfacing, and coagulation of soft tissue.

FDA Product Codes GEX, ONG.

## Rationale

### Background

#### Hypertrophic Scars and Keloids

Hypertrophic scars and keloids are cutaneous lesions resulting from abnormal wound healing. Hypertrophic scars present as raised lesions that do not exceed the limits of the original skin injury.

They tend to regress spontaneously within 1 year.<sup>1</sup> Keloids present as raised, firm lesions that extend beyond the margins of original injury. Keloids do not regress spontaneously, are often refractory to treatment, and have a high probability of recurrence after excision. The highest prevalence of keloids is in people of color, with an incidence of up to 16% in Black Africans.<sup>2</sup> Keloids can occur months or years after injury.<sup>3</sup>

Consensus-based clinical recommendations published in 2014 endorsed the use of a scar classification system first developed in 2002.<sup>4</sup> In this system, hypertrophic scars are classified as linear (e.g., surgical, traumatic) or widespread (e.g., burn). Keloids are classified as minor or major.

Minor keloids are focally raised, itchy scars extending over normal tissue. Major keloids are large, raised (>0.5 cm) scars, possibly painful or pruritic, and extending over normal tissue. Major keloids are often refractory to treatment and have a high probability of recurrence after excision. Mature scars are light-colored and flat. Immature scars are slightly elevated in the process of remodeling and may be painful or itchy. Immature hypertrophic scars (red, slightly raised) may develop into hypertrophic scars; if they persist for longer than 1 month, the guidelines recommend treating them as a linear hypertrophic scar.

There is no gold standard therapy for hypertrophic scars and keloids, and treatment frequently involves multiple techniques including pharmacotherapy, compression, surgery, radiation, and light sources.<sup>5</sup>

#### Laser Therapy for Scar Treatment

Carbon dioxide (CO2) fractional laser treatment was initially developed for cosmetic purposes (e.g., photoaging, acne scarring). Fractional CO2 laser ablation works by creating microscopic thermal wounds, resulting in tissue vaporization and coagulation of surrounding extracellular proteins. The technique has the advantage of reaching the dermis by ablating the epidermis, while avoiding complications associated with nonfractional ablative lasers (no longer in use), such as postoperative pain and infection. For scars and keloids impairing function, CO2 fractional ablative laser treatment is proposed to improve abnormal texture, thickness, and stiffness of scars by ablative destruction and resurfacing. The treatment may be used as monotherapy or in combination with other therapies (e.g., sequential treatment with other lasers, sequential treatment with other therapies, or laser-assisted drug delivery).

This review focuses on CO2 fractional ablative laser treatment for functional improvement. Other types of lasers used for hypertrophic scars and keloids include pulsed dye laser and intense pulse light.

## Literature Review

Evidence reviews assess the clinical evidence to determine whether the use of a technology improves the net health outcome. Broadly defined, health outcomes are length of life, quality of life, and ability to function including benefits and harms. Every clinical condition has specific outcomes that are important to patients and to managing the course of that condition. Validated outcome measures are necessary to ascertain whether a condition improves or worsens; and whether the magnitude of that change is clinically significant. The net health outcome is a balance of benefits and harms.

To assess whether the evidence is sufficient to draw conclusions about the net health outcome of a technology, 2 domains are examined: the relevance and the quality and credibility. To be relevant, studies must represent one or more intended clinical use of the technology in the intended population and compare an effective and appropriate alternative at a comparable intensity. For some conditions, the alternative will be supportive care or surveillance. The quality and credibility of the evidence depend on study design and conduct, minimizing bias and confounding that can generate incorrect findings. The randomized controlled trial is preferred to assess efficacy; however, in some circumstances, nonrandomized studies may be adequate. Randomized controlled trials are rarely large enough or long enough to capture less common adverse events and long-term effects. Other types of studies can be used for these purposes and to assess generalizability to broader clinical populations and settings of clinical practice.

Promotion of greater diversity and inclusion in clinical research of historically marginalized groups (e.g., People of Color [African-American, Asian, Black, Latino and Native American]; LGBTQIA (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual); Women; and People with Disabilities [Physical and Invisible]) allows policy populations to be more reflective of and findings more applicable to our diverse members. While we also strive to use inclusive language related to these groups in our policies, use of gender-specific nouns (e.g., women, men, sisters, etc.) will continue when reflective of language used in publications describing study populations.

## Fractional Carbon Dioxide Laser Ablation for Hypertrophic Scars or Keloids Clinical Context and Therapy Purpose

The purpose of fractional carbon dioxide (CO<sub>2</sub>) laser ablation in individuals who have who have hypertrophic scars or keloids impairing function is to improve function.

The following PICO was used to select literature to inform this review.

### *Populations*

The relevant populations of interest are individuals with hypertrophic scars or keloids impairing function (e.g., range of motion, strength, activities of daily living).

### *Interventions*

The therapy being considered is fractional CO<sub>2</sub> laser ablation.

Fractional CO<sub>2</sub> ablative laser treatment may be used as monotherapy or in combination with other therapies (e.g., sequential treatment with other lasers, sequential treatment with other therapies, or laser-assisted drug delivery).

### *Comparators*

Standard care for linear hypertrophic scars includes silicone-based gel or sheeting. Adjunctive use of intralesional corticosteroid injection or 5-fluorouracil is indicated if a 2-month course of silicone gel or sheeting is not effective or if the scar is severe. Surgical intervention to relieve tension is an option when scarring creates functional impairment. For severe scars, surgical excision may be accompanied by layering of triamcinolone, long-term placement of intradermal sutures, and subsequent monthly corticosteroid administration.

First-line treatment for hypertrophic burn scars is silicone gel preparations. Pressure garments and onion extract-containing formulations may also be used. The complexity of managing burn scars will often require personalized management consisting of combination or alternative therapies including: silicone gel sheeting; individualized pressure therapy; massage, physical therapy, or both; corticosteroid application; and surgical procedures.

Standard care for keloid scars includes silicone-based dressings and compression dressings.<sup>2</sup> For established keloids, intralesional corticosteroids are the first-line treatment.<sup>2</sup>

If improvement with conservative therapy is not observed within 8 to 12 weeks, 5-FU in combination with intralesional corticosteroids and, ultimately, laser therapy or surgical excision may be considered.

Consensus guidelines recommend monthly intralesional corticosteroid administration with or without adjuvant cryotherapy as a first-line option for major keloids. If this strategy is not effective within 3 to 4 months, transition to therapy with monthly intralesional 5-FU and triamcinolone is recommended. Secondary management options for refractory keloids include surgical excision with appropriate prophylactic therapy.

Consensus guidelines note that strategies for managing pathologic scarring are largely determined by scar classification. History of scarring, including past treatment failures or successes, as well as the likelihood of compliance with a chosen therapeutic regimen also influence treatment selection.

### ***Outcomes***

Functional outcomes (range of motion, strength, activities of daily living) are the primary outcomes of interest for this review. Additional outcomes of interest are symptoms (pain, itch), quality of life, and adverse effects of treatment.

Frequently-used instruments used for scar assessment in research studies and clinical practice include the Vancouver Scar Scale and the Patient-Observer Scar Assessment Scale (POSAS).<sup>6</sup> Their usefulness is limited however, because they are not intended to measure functional outcomes. The VSS score is based on 4 parameters (vascularization, height/thickness, pliability, and pigmentation). The POSAS includes an assessment of functional compromise, but is scored as an aggregate of disfigurement, functional compromise, pain, and itch. No minimally clinically important difference has been identified for these scales, and no single scale has been established as the gold standard. [Buhalog]

### **Study Selection Criteria**

Methodologically credible studies were selected using the following principles:

- Good methodological quality systematic reviews (i.e., more than 1 database searched, search strategy and inclusion criteria specified, quality assessment of individual studies, and assessment of the overall body of evidence).
- To assess efficacy outcomes, comparative controlled prospective trials were sought, with a preference for RCTs.
- In the absence of such trials, comparative observational studies were sought, with a preference for prospective studies.
- To assess long-term outcomes and adverse events, single-arm studies that capture longer periods of follow-up and/or larger populations were sought.
- Consistent with a 'best available evidence approach,' within each category of study design, studies with larger sample sizes and longer durations were sought.
- Studies with duplicative or overlapping populations were excluded.

## Review of Evidence

### Overview of Systematic Reviews

Three recent, good methodological quality systematic reviews have evaluated laser treatment for hypertrophic scars and keloids.<sup>7,1,2</sup> The individual studies included in these systematic reviews are listed in Table 1. The reviews differed in their inclusion criteria and focus (see Table 2), resulting in differences in the bodies of evidence evaluated. Across the reviews, a total of 6 RCTs that evaluated CO2 fractional laser ablation were identified,<sup>1</sup> of which was published only in abstract form.

Buhalog et al (2021) conducted a systematic review of laser therapies for hypertrophic burn and traumatic scars.<sup>7</sup> Of 23 studies included, 3 RCTs and 3 nonrandomized studies evaluated CO2 fractional laser ablation. Overall, the reviewers found improvements in nearly all outcome measures across all types of laser therapy. However, conclusions were limited by heterogeneity of the studies and a lack of outcomes measuring function. The study authors recommended that future research include standardized protocols including assessments of function and quality of life.

A Cochrane review conducted by Leszczynski et al (2022) evaluated various laser treatments for hypertrophic scars and keloids.<sup>1</sup> The reviewers included a total of 15 RCTs. Of these, 3 evaluated CO2 fractional laser ablation. Overall, the authors concluded that there is insufficient evidence to support or refute the effectiveness of laser therapy for treating hypertrophic and keloid scars. The available information was also insufficient to perform a more accurate analysis on treatment-related adverse effects related to laser therapy. Specific to CO2 laser treatment, they concluded that it is unclear whether fractional CO2 laser impacts on hypertrophic and keloid scar severity compared with no treatment (very low-certainty evidence). There was not enough data to compare fractional CO2 laser versus other interventions. Limitations of the overall body of evidence included heterogeneity of the studies, conflicting results, study design issues and small sample sizes. The authors noted that further high-quality trials are needed.

Walsh et al (2023) conducted a systematic review of keloid treatments published between 2010 and 2020.<sup>2</sup> Of 108 studies included, 5 (2 RCTs) evaluated CO2 laser ablation. In the RCTs, fractional CO2 showed no difference in improvement compared to intralesional verapamil or triamcinolone, and efficacy of CO2 laser with intralesional triamcinolone compared to cryotherapy with intralesional triamcinolone was not significantly different. In 2 nonrandomized studies, recurrence rates were 10.5% at 24 months and 11.7% at 6 months. The reviewers concluded that for all interventions, conclusions were limited by heterogeneity of subject characteristics and study outcomes measures, small sample sizes, and inconsistent study designs.

**Table 1. Studies of Fractional CO2 Ablative Laser Treatment Included in Systematic Reviews of Laser Treatment for Hypertrophic Scars or Keloids**

Study First Author, Year	Study Design	N Intervention	Comparator	Buhalog et al (2021) <sup>7</sup> Hypertrophic scars only	Leszczynski et al (2022) <sup>1</sup> Hypertrophic scars or keloids	Walsh et al (2023) <sup>2</sup> Keloids only
Annabathula 2017 <sup>8</sup>	Prospective Cohort	Combination- Sequential, multiple laser treatments	None			

Study First Author, Year	Study Design	N Intervention	Comparator	Buhalog et al (2021) <sup>7</sup> : Hypertrophic scars only	Leszczynski et al (2022) <sup>1</sup> : Hypertrophic scars or keloids	Walsh et al (2023) <sup>2</sup> : Keloids only
Dauod 2019 <sup>12</sup>	RCT	Monotherapy and combination therapy (sequential, multiple lasers)	No laser treatment			

Study	Literature Search Date	Included Study Designs	Participant Eligibility Criteria	Included Interventions	Included Comparators	Overall Conclusions
<b>Leszczynski et al (2022)</b> <sup>1</sup>	March 2021	RCTs	Individuals with hypertrophic or keloid scars (or both), who had been diagnosed by a health professional, with no restrictions regarding age, sex, or ethnicity.	Laser therapy with any laser device, using any fluency, course duration, number of sessions, and follow-up time	No intervention or any other type of therapy	Unclear whether fractional CO2 laser impacts scar severity compared with no treatment as measured by commonly used scar scales (very low-certainty evidence).  Insufficient data to compare fractional CO2 laser versus other interventions.  No data on functional outcomes
<b>Walsh et al (2023)</b> <sup>2</sup>	November 2020	Prospective, including non-randomized interventional studies and RCTs	Individuals with keloids	Corticosteroids, cryotherapy, intralesional injection, ablative and non-ablative lasers, photodynamic therapy, radiotherapy, silicone and pressure, other,	No restrictions	Fractional CO2 showed no difference in improvement vs intralesional verapamil or triamcinolone  CO2 laser + intralesional triamcinolone vs cryotherapy + intralesional triamcinolone was not significantly different.  No data on functional outcomes

CO2: carbon dioxide; RCT: randomized controlled trial.

### Randomized Controlled Trials

The following sections provide more detail on the RCTs included in the systematic reviews discussed above. The full-text of these RCTs were reviewed to determine if they provided information on functional outcomes, but no additional data was identified. We identified no additional or more recent RCTs not included in the systematic reviews.

### Monotherapy for Hypertrophic Scars

Three RCTs included in the Cochrane review evaluated CO2 fractional therapy as monotherapy versus no treatment.<sup>9,11,12</sup> For all outcomes reported, the review authors graded the overall evidence as very low certainty, downgraded for very serious imprecision and serious risk of bias. None of the studies evaluated functional outcomes.

### Monotherapy for Keloids

One RCT included in the Cochrane review evaluated CO2 fractional laser therapy monotherapy for keloids.<sup>9</sup> The review authors concluded that it is uncertain whether fractional CO2 impacts on keloid scar severity compared to no treatment after up to 6 months, downgrading the evidence for very serious imprecision and serious risk of bias. Adverse events were not assessed. Scar pain and pruritus outcomes were not presented by treatment arm.

Walsh et al included 1 RCT of CO2 fractional laser monotherapy versus intralesional triamcinolone and found no significant differences between keloid response but faster improvement in the intralesional triamcinolone group.<sup>17</sup>

Neither study evaluated functional outcomes.

### **Combination Therapy for Hypertrophic Scars**

Buhalog et al included a 3-arm RCT that compared combination therapy with CO2 laser plus IPL, CO2 monotherapy, or no therapy in 23 individuals with hypertrophic scars.<sup>12</sup> Statistically significant improvements were found on the Manchester Scar Scale and the POSAS for both CO2 plus IPL laser and for CO2 alone. The reviewers determined the trial was at unclear risk of bias for unclear adequacy of allocation concealment and blinding. Functional outcomes were not evaluated and adverse events were not reported.

### **Combination Therapy for Keloids**

One RCT included in both the Cochrane review and in Walsh et al compared CO2 laser plus intralesional triamcinolone to cryosurgery plus triamcinolone.<sup>10</sup> Of 60 individuals enrolled, 23 were lost to follow-up and not assessed. Scar severity ratings favored the laser therapy group at 12 months, but certainty of the evidence was downgraded due to very serious imprecision and serious risk of bias. Pain not related to treatment favored the CO2 group, but there was no difference in pruritus score. There were more frequent early adverse effects in the CO2 laser group. At 12 months, there was a recurrence of 6 keloid scars (16.7%), all of which were in the CO2 laser group.

### **Supplemental Information**

The purpose of the following information is to provide reference material. Inclusion does not imply endorsement or alignment with the evidence review conclusions.

### **Practice Guidelines and Position Statements**

Guidelines or position statements will be considered for inclusion in 'Supplemental Information' if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

### **International Advisory Panel on Scar Management**

In 2014, Gold et al published updated international clinical recommendations on scar management.<sup>4</sup> Although they were not informed by a systematic review and strength of evidence ratings were not provided, the recommendations are frequently cited and were accompanied by a narrative review of the literature.<sup>5</sup> The recommendation document notes that, where clinical evidence was lacking, management recommendations were based on advisory panel member consensus.

Specific recommendations on laser therapy include the following, according to scar classification:

#### **Immature or Erythmatous Hypertrophic Scars**

- "In the case of persistent erythema for more than a month despite preventative efforts, management should transition to that of a linear hypertrophic scar or alternatively, pulsed-dye laser therapy may be applied once monthly for 2 to 3 months. If the scar is unresponsive to the pulsed-dye laser, fractional laser therapy or treatment as a linear hypertrophic scar may be instituted."

#### **Linear Hypertrophic Scars Arising from Surgery or Trauma**

- "Pulsed-dye or fractional laser therapy are second-line and, often, first -line options for linear hypertrophic scars."



### Widespread Burn Hypertrophic Scars

- "Positive data for fractional lasers support their use for burn scar treatment. Ablative fractional lasers offer the advantage of fewer treatment sessions compared with nonablative options."

### Minor Keloids

- If improvement with conservative therapy is not observed within 8 to 12 weeks, 5-FU in combination with intralesional corticosteroids and, ultimately, laser therapy or surgical excision may be considered. Although data from published clinical trials are lacking, some advisory panel members suggest the use of ablative fractional lasers over other types of laser therapy for the treatment of refractory keloids."

### Major Keloids

- "Secondary management options for refractory keloids include laser treatment and surgical excision with appropriate prophylactic therapy."

### Consensus Recommendations

In 2020, Seago et al published consensus recommendations on laser treatment of scars and contractures.<sup>6</sup> The recommendations were developed by a panel of 26 dermatologists and plastic and reconstructive surgeons from 13 countries between March 2018 and March 2019. The panel used a modified Delphi method consisting of 2 rounds of email questionnaires and supplementary face-to-face meetings. The threshold for consensus recommendations was at least 80% concurrence among the panel members. The recommendations were not informed by a systematic review and do not include strength of evidence ratings.

Specific recommendation statements on laser therapy include the following:

- "The panel members are unanimous in their view that lasers are a first-line therapy in the management of traumatic scars and contractures."
- "The potential indications for laser treatment are determined based on clinical findings (i.e., erythema, hypopigmentation, hyperpigmentation, atrophy, hypertrophy, degree of epithelialization, pliability, and restriction) as well as subjective symptoms including pain and pruritus."
- "The fractional lasers, especially AFL, have the most potential to treat the entire range of clinical issues as a single modality. The optimal treatment routinely includes multiple laser types in concurrent or alternating treatment sessions to suit varying clinical presentations and treatment goals in a particular location at a particular time. Effective comprehensive traumatic scar management frequently incorporates surgical evaluation, ongoing conservative measures (i.e., compression, massage, and silicone gels and sheets); physical and occupational therapy; medical management such as corticosteroids and antimetabolites; and mental health evaluation where appropriate."

The document also includes recommendations on device application and settings but notes, "Optimal wavelengths and settings for traumatic scar management have not yet been fully elaborated in the literature and settings will vary depending on the characteristics of the particular device chosen by the operator, the clinical findings on the day of the visit (e.g., degree of erythema, presence of a tan, etc.), and issues specific to the patient (e.g., pain tolerance, approximate downtime, etc.)."

In its recommendations on scar assessment, the panel noted, "Continuing research is vital to determining the optimal laser devices, timing, combinations, and settings in the management of traumatic scars," and "Given the greater range of scar response to current laser techniques such as AFL, future scar assessment should incorporate evaluation of function, symptom relief, and overall quality of life to a greater extent."

### U.S. Preventive Services Task Force Recommendations

Not applicable.

### Medicare National Coverage

There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

### Ongoing and Unpublished Clinical Trials

Some currently unpublished trials that might influence this review are listed in Table 3.

**Table 3. Summary of Key Trials**

NCT No.	Trial Name	Planned Enrollment	Completion Date
<i>Ongoing</i>			
NCT04736251	A Prospective Intra-patient Single-blinded Randomised Trial to Examine the Mechanistic Basis of fractional Ablative carbon Dioxide Laser Therapy in Treating Adult Burns and/or Trauma Patients With Hypertrophic Scarring (SMOOTH)	60	Aug 2023
NCT04567537	Ablative Fractional Laser Treatment for the Improvement of Hypertrophic Scars and Scleroderma: a Prospective Cohort Study	20	May 2024
NCT03692273	A Within-Scar, Randomized Control Trial Comparing Fractional Ablative Carbon Dioxide Laser to Non-Energy-Based, Mechanical Tissue Extraction and No Treatment	120	Dec 2024
NCT04364217	Evaluating the Mechanism of Pain and Itch Reduction in Burn Scars Following Fractional Ablative CO2 Laser Treatment	28	Jul 2025

NCT: national clinical trial.

### References

1. Leszczynski R, da Silva CA, Pinto ACPN, et al. Laser therapy for treating hypertrophic and keloid scars. *Cochrane Database Syst Rev.* Sep 26 2022; 9(9): CD011642. PMID 36161591
2. Walsh LA, Wu E, Pontes D, et al. Keloid treatments: an evidence-based systematic review of recent advances. *Syst Rev.* Mar 14 2023; 12(1): 42. PMID 36918908
3. UpToDate. Laser Therapy for Hypertrophic Scars and Keloids. 2023. <http://tinyurl.com/5x5d4tkr>. Accessed November 20, 2023.
4. Gold MH, McGuire M, Mustoe TA, et al. Updated international clinical recommendations on scar management: part 2--algorithms for scar prevention and treatment. *Dermatol Surg.* Aug 2014; 40(8): 825-31. PMID 25068544
5. Gold MH, Berman B, Clementoni MT, et al. Updated international clinical recommendations on scar management: part 1--evaluating the evidence. *Dermatol Surg.* Aug 2014; 40(8): 817-24. PMID 25068543
6. Seago M, Shumaker PR, Spring LK, et al. Laser Treatment of Traumatic Scars and Contractures: 2020 International Consensus Recommendations. *Lasers Surg Med.* Feb 2020; 52(2): 96-116. PMID 31820478
7. Buhalog B, Moustafa F, Arkin L, et al. Ablative fractional laser treatment of hypertrophic burn and traumatic scars: a systematic review of the literature. *Arch Dermatol Res.* Jul 2021; 313(5): 301-317. PMID 32926192
8. Annabathula A, Sekar CS, Srinivas CR. Fractional Carbon Dioxide, Long Pulse Nd:YAG and Pulsed Dye Laser in the Management of Keloids. *J Cutan Aesthet Surg.* 2017; 10(2): 76-80. PMID 28852292

9. Azzam OA, Bassiouny DA, El-Hawary MS, et al. Treatment of hypertrophic scars and keloids by fractional carbon dioxide laser: a clinical, histological, and immunohistochemical study. *Lasers Med Sci.* Jan 2016; 31(1): 9-18. PMID 26498451
10. Behera B, Kumari R, Thappa DM, et al. Therapeutic Efficacy of Intralesional Steroid With Carbon Dioxide Laser Versus With Cryotherapy in Treatment of Keloids: A Randomized Controlled Trial. *Dermatol Surg.* Oct 2016; 42(10): 1188-98. PMID 27661432
11. Blome-Eberwein S, Gogal C, Weiss MJ, et al. Prospective Evaluation of Fractional CO2 Laser Treatment of Mature Burn Scars. *J Burn Care Res.* 2016; 37(6): 379-387. PMID 27828835
12. Daoud AA, Gianatasio C, Rudnick A, et al. Efficacy of Combined Intense Pulsed Light (IPL) With Fractional CO2 -Laser Ablation in the Treatment of Large Hypertrophic Scars: A Prospective, Randomized Control Trial. *Lasers Surg Med.* Oct 2019; 51(8): 678-685. PMID 31090087
13. Garg GA, Sao PP, Khopkar US. Effect of carbon dioxide laser ablation followed by intralesional steroids on keloids. *J Cutan Aesthet Surg.* Jan 2011; 4(1): 2-6. PMID 21572673
14. Maari C (2017). Randomized, controlled, within-patient, single-blinded pilot study to evaluate the efficacy of the ablatie fractional CO2 laser in the treatment of hypertrophic scars in adult burn patients. *J Am Acad Dermatol* 76:AB212.
15. Majid I, Imran S. Fractional Carbon Dioxide Laser Resurfacing in Combination With Potent Topical Corticosteroids for Hypertrophic Burn Scars in the Pediatric Age Group: An Open Label Study. *Dermatol Surg.* Aug 2018; 44(8): 1102-1108. PMID 30045141
16. Makboul M, Makboul R, Abdelhafez AH, et al. Evaluation of the effect of fractional CO2 laser on histopathological picture and TGF-β1 expression in hypertrophic scar. *J Cosmet Dermatol.* Sep 2014; 13(3): 169-79. PMID 25196683
17. Srivastava S, Kumari H, Singh A. Comparison of Fractional CO2 Laser, Verapamil, and Triamcinolone for the Treatment of Keloid. *Adv Wound Care (New Rochelle).* Jan 01 2019; 8(1): 7-13. PMID 30705785
18. Wang J, Wu J, Xu M, et al. Combination therapy of refractory keloid with ultrapulse fractional carbon dioxide (CO2) laser and topical triamcinolone in Asians-long-term prevention of keloid recurrence. *Dermatol Ther.* Nov 2020; 33(6): e14359. PMID 33002270
19. Zuccaro J, Muser I, Singh M, et al. Laser Therapy for Pediatric Burn Scars: Focusing on a Combined Treatment Approach. *J Burn Care Res.* Apr 20 2018; 39(3): 457-462. PMID 29897540

### Documentation for Clinical Review

- No records required

### Coding

*This Policy relates only to the services or supplies described herein. Benefits may vary according to product design; therefore, contract language should be reviewed before applying the terms of the Policy.*

*The following codes are included below for informational purposes. Inclusion or exclusion of a code(s) does not constitute or imply member coverage or provider reimbursement policy. Policy Statements are intended to provide member coverage information and may include the use of some codes for clarity. The Policy Guidelines section may also provide additional information for how to interpret the Policy Statements and to provide coding guidance in some cases.*

Type	Code	Description
CPT®	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

Type	Code	Description
	0480T	Fractional ablative laser fenestration of burn and traumatic scars for functional improvement; each additional 100 cm <sup>2</sup> , or each additional 1% of body surface area of infants and children, or part thereof (List separately in addition to code for primary procedure)
HCPCS	None	

### Policy History

This section provides a chronological history of the activities, updates and changes that have occurred with this Medical Policy.

Effective Date	Action
04/01/2024	New policy.

### Definitions of Decision Determinations

**Medically Necessary:** Services that are Medically Necessary include only those which have been established as safe and effective, are furnished under generally accepted professional standards to treat illness, injury or medical condition, and which, as determined by Blue Shield, are: (a) consistent with Blue Shield medical policy; (b) consistent with the symptoms or diagnosis; (c) not furnished primarily for the convenience of the patient, the attending Physician or other provider; (d) furnished at the most appropriate level which can be provided safely and effectively to the patient; and (e) not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of the Member’s illness, injury, or disease.

**Investigational/Experimental:** A treatment, procedure, or drug is investigational when it has not been recognized as safe and effective for use in treating the particular condition in accordance with generally accepted professional medical standards. This includes services where approval by the federal or state governmental is required prior to use, but has not yet been granted.

**Split Evaluation:** Blue Shield of California/Blue Shield of California Life & Health Insurance Company (Blue Shield) policy review can result in a split evaluation, where a treatment, procedure, or drug will be considered to be investigational for certain indications or conditions, but will be deemed safe and effective for other indications or conditions, and therefore potentially medically necessary in those instances.

### Prior Authorization Requirements and Feedback (as applicable to your plan)

Within five days before the actual date of service, the provider must confirm with Blue Shield that the member's health plan coverage is still in effect. Blue Shield reserves the right to revoke an authorization prior to services being rendered based on cancellation of the member's eligibility. Final determination of benefits will be made after review of the claim for limitations or exclusions.

Questions regarding the applicability of this policy should be directed to the Prior Authorization Department at (800) 541-6652, or the Transplant Case Management Department at (800) 637-2066 ext. 3507708 or visit the provider portal at [www.blueshieldca.com/provider](http://www.blueshieldca.com/provider).

We are interested in receiving feedback relative to developing, adopting, and reviewing criteria for medical policy. Any licensed practitioner who is contracted with Blue Shield of California or Blue

Shield of California Promise Health Plan is welcome to provide comments, suggestions, or concerns. Our internal policy committees will receive and take your comments into consideration.

For utilization and medical policy feedback, please send comments to: [MedPolicy@blueshieldca.com](mailto:MedPolicy@blueshieldca.com)

*Disclaimer: This medical policy is a guide in evaluating the medical necessity of a particular service or treatment. Blue Shield of California may consider published peer-reviewed scientific literature, national guidelines, and local standards of practice in developing its medical policy. Federal and state law, as well as contract language, including definitions and specific contract provisions/exclusions, take precedence over medical policy and must be considered first in determining covered services. Member contracts may differ in their benefits. Blue Shield reserves the right to review and update policies as appropriate.*

**Appendix A**

POLICY STATEMENT	
BEFORE	AFTER
<p><b>New Policy</b></p> <p><b>Policy Statement:</b> N/A</p>	<p style="text-align: center;"><u>Blue font: Verbiage Changes/Additions</u></p> <p><b>Fractional Carbon Dioxide (CO2) Laser Ablation Treatment of Hypertrophic Scars or Keloids for Functional Improvement 2.01.107</b></p> <p><b>Policy Statement:</b></p> <ol style="list-style-type: none"> <li>I. Carbon dioxide (CO2) fractional laser ablation treatment of hypertrophic scars or keloids for functional improvement is considered <b>investigational</b>.</li> </ol>