

# LASER TREATMENT OF PERIORAL WRINKLES



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Treating perioral wrinkles, especially those that appear on the upper lip, also called "bar code" because of their appearance, generates a challenge for plastic surgeons.

The objective of any treatment that seeks to improve this aspect should be, firstly, to eliminate skin erosion, to even out the irregularities of the skin surface, and secondly thicken the dermis, either by applying fillers within the reticular dermal tissue or by stimulating the fibroblast with physical or chemical methods to generate more outstanding production of collagen, elastin and fundamental substance, thus thickening the dermal tissue and therefore filling in the depressions characteristic of perioral wrinkles.

Among the physical and chemical methods that achieve the double objective of eroding the surface of the skin and stimulating the fibroblast, we can mention:

- Dermabrasion
- Microdermabrasion
- Chemical Peeling
- Ablative Fractional Radiofrequency
- Plasma Radiofrequency
- Ablative Lasers

Ablative lasers stand out on this list for their speed of action and the magnitude of the changes they generate. Among the ablative lasers used on the skin, we have:

- Thulium Laser
- Erbium-YAG Laser
- Fractional Carbon Dioxide (CO<sub>2</sub>) Laser

The wavelengths within the electromagnetic light spectrum of these lasers are Thulium laser 1940 nm, Erbium-YAG laser 2940 nm, CO<sub>2</sub> laser 10600 nm. The wavelengths of the Thulium and Erbium-YAG lasers (1940 nm and 2940 nm) have a high affinity and absorption for water. This high affinity makes their absorption and action very superficial, as well as the epidermis and papillary dermis. This makes them very effective in ablation but with minimal coagulation effect or thermal transfer to the reticular dermal plane and, therefore, minimal effect of fibroblast stimulation and less impact on the production of the dermis. On the contrary, the CO<sub>2</sub> laser significantly affects deep cutaneous thermal transfer, thus achieving superficial skin ablation, fibroblast stimulation, and lifting or elevating effects through skin contraction.

Besides its great benefits, this great thermal transfer carries the risk of more significant adverse effects, such as post-inflammatory hyperpigmentation (PIH) and a prolonged and persistent dark brown tone in the treated areas after a CO<sub>2</sub> laser application.

According to the Fitzpatrick Skin Type Scale (from I to VI), dark skins carry a greater risk of PIH than the rest of the skin colors (**Figure 1**).

The most common skin tones in my country, Argentina, are types II to V (brown color), with very few types I (white skin color) and type VI (black skin color), and skin tones type III to V are those that carry a greater risk of PIH.

The key to success in treating dark skin and preventing the appearance of PIH is to prescribe treatment before applying the laser treatment - ideally one month before - and, in









Type I	Type II	Type III	Type IV	Type V	Type VI
					
Light, pale white	White, fair	Medium, white to olive	Olive, moderate brown	Brown, dark brown	Black, very dark brown to black
Always burns, never tans	Usually burns, tans with difficulty	Sometimes mild burn, gradually tans to olive	Rarely burns, tans with ease to a moderate brown	Very rarely burns, tans very easily	Never burns, tans very easily, deeply pigmented

Figure 2. Fitzpatrick skin types.

cases where PIH appears, to carry out the same treatment for three to six months (*Figure 1 and Table 1*).

It is recommended that you apply it every other night. The action is neutralized in the morning by washing the face with pH-neutral soap. The choice of the formula is based on the evaluation of the phototype, history of hyperpigmentation, and current presence of some degree of hyperpigmentation.

#### The formulations are as follows:

##### Formula A

- Tranexamic Acid 2%
- Kojic Acid 2%
- Hydrocortisone 1%
- Tretinoin 0.05%

##### Formula B

- Hydroquinone 2%
- Kojic Acid 2%
- Hydrocortisone 1%
- Tretinoin 0.05%

#### The CO<sub>2</sub> laser treatment characteristics

At the time of the pre-treatment consultation for laser resurfacing with fractionated CO<sub>2</sub>, and when the patient requests an improvement in perioral wrinkles alone or within the improvement in other facial aspects, the first thing to do is analyze the skin phototype. On one hand, it is done through clinical observation and, on the other hand, it is

done by asking the patient about their skin's reaction to sun exposure (*Figure 1*). Based on this clinical evaluation and the patient's responses, their skin color type is established according to the Fitzpatrick Scale (*Figure 1*).

Suppose we are facing a Fitzpatrick III to IV. In that case, ideally, we delay the laser treatment for one month and instruct you to apply Formula A or Formula B every other night on the skin of the area to be treated (the entire face or just perioral skin), stopping one week before the day of laser resurfacing treatment.

#### ON THE DAY OF TREATMENT

Cleaning the area to be treated with chlorhexidine antiseptic solution. Anesthetic cream is applied (10% lidocaine, 10% tetracaine, and 10% benzocaine), a film is placed over the cream to increase its absorption, and the patient is left to rest for 20 minutes. At the end of these 20 minutes, the remains of the cream is removed from the perioral area. The fractional CO<sub>2</sub> laser (iPixel CO<sub>2</sub>, Alma Lasers) is applied. Depending on the patient's degree of wrinkles according to the Glasgow Wrinkle Scale (*Table 1*), the parameters to be used will be decided (*Figures 2 A-B and 3 A-B*).

#### POST-TREATMENT

Immediately at the end, it is advised to take analgesics only for that same day (ibuprofen 400 mg, one single dose), constantly moisturize the treated skin with Vaseline for a week and avoid sun exposure for one month. One month after treatment, and depending on the case, palliation of formulas A or B is resumed to treat or prevent possible PIH.



Table 1: Glogau wrinkle scale.

Glogau skin type	Photoageing classification	Age (years)	Skin characteristics
I	Mild	28 to 35	<ul style="list-style-type: none"> <li>No wrinkles</li> <li>Early photoageing: mild pigment changes, no keratosis, minimal wrinkles, minimal or no make-up</li> </ul>
II	Moderate	35 to 50	<ul style="list-style-type: none"> <li>Wrinkles in motion</li> <li>Early to moderate photoageing: early brown spots visible, keratosis palpable but not visible, parallel smile lines appear, wears more foundation</li> </ul>
III	Advanced	50 to 65	<ul style="list-style-type: none"> <li>Wrinkles at rest</li> <li>Advanced photoageing: obvious discolouration, visible capillaries, visible keratosis, wears heavier make-up</li> </ul>
IV	Severe	60 and over	<ul style="list-style-type: none"> <li>Only wrinkles</li> <li>Severe photoageing: yellow/grey skin colour, prior skin malignancies, wrinkles throughout, no normal skin, cannot wear make-up because it cracks and cakes</li> </ul>



Figure 2A: A 69-year-old female patient, Fitzpatrick V, and Glogau IV. Before and after the treatment - two sessions of fractional CO<sub>2</sub> with a delay of three months. Parameters: 9 x 9 resurfacing handpiece, low 190 millijoules / medium 120 millijoules / high 120 millijoules, two passes of each one.

Figure 2B: Before and after treatment of the same 69-year-old female patient in grayscale to better appreciate the results.



Figure 3A: A female 49-year-old patient, Fitzpatrick III, and Glogau III. Before and after the treatment - only one session of fractional CO<sub>2</sub> with a delay of three months. Parameters: 9 x 9 resurfacing handpiece, low 160 millijoules / medium 120 millijoules / high 95 millijoules, two passes of each one.



Figure 3B: Before and after treatment of the same 49-year-old female patient in grayscale to better appreciate the results.







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## INSIDE ■

**How I Do It:**  
Perioral Rhytids

**Global Trends:**  
Dr. Amin Kalaaji

**Shoulders of Giants:** Neven  
Olivari and David Serson Neto

**Coffee & Anecdotes** with  
Dr. Susumu Takayanagi