



How does laser therapy work for scars?



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It might seem unusual at first to think of a doctor using laser therapy to treat a burn injury scar. Why would burning the body's tissue further help a patient heal? But lasers are an extremely valuable tool in treating patients' scars.

Doctors first began improving the appearance of scars with laser therapy in the 1980s, and the treatment has become increasingly popular over the years. Our colleagues in plastic surgery and dermatology use lasers for cosmetic procedures all the time. The main difference is that we are trained to use these lasers at a much higher power level, specifically targeting the thick tissue associated with cutaneous scars. Our lasers could never be used for cosmetic procedures at the same settings as they are for scar treatment, as it would result in major damage to the patient.

The high price of laser equipment can be a major obstacle for centers that want to offer laser scar revision. Some burn centers rent lasers and use them

once a month for patients who are interested in revision therapy, but that limits the number of appointments they have available for treatment. Through generous philanthropic donations from our supporters, we are fortunate enough to own our laser scar revision equipment, allowing us to treat many patients every week. In our Burn Center, we use the power of lasers to improve both the functionality and appearance of scar tissue for our patients, a combination that can't be found from those who only treat how scars look.

The layered effects of scar tissue.

To understand how lasers help us treat scars, it's helpful to understand how a scar forms in the first place. When you suffer a burn or another traumatic injury to the skin, your body devotes a huge portion of its resources to a single goal: getting that wound closed fast.

When the body accelerates the healing process for burned or damaged skin, you don't get organized, neatly stacked cells and collagen like you have in healthy

skin. Instead, you end up with a mix of cells and collagen piled into a thick, stiffened scar. These scars can come with a number of side effects, including:

- Limited movement, especially when scars extend over a joint
- Itchiness
- Pain
- An unpleasant appearance

The idea behind laser scar revision is that when the body isn't actively battling the burn or injury, it can devote more time and resources to remodeling a scar properly instead of just quickly. To make this happen, we have to replace that thickened scar tissue first.

Laser power for scar treatment.

Our carbon dioxide laser, which targets water in the scar tissue, gives the body a second chance at wound healing. We use a fractional ablative laser, which means only a fraction of the laser's target is touched by its beams.

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The beams of the fractional ablative CO2 laser typically target one to five percent of the patient's scar tissue during each laser scar revision session. That's large enough for us to make progress with the patient's scar, but small enough to avoid creating new wounds for the patient. The laser creates microscopic tunnels in the scar tissue that are replaced with regular tissue so that, over time, the dense scar tissue gives way to more normal skin. Some patients report easier movement or decreased pain after just one treatment. The total course of laser therapy might take three to 12 monthly visits, depending on the severity of the patient's scar and the improvements they want to see.

Another scar revision technique we use is intense pulsed light, or IPL. The goal of this treatment is to further improve the appearance of patients' scars. Though this isn't a true laser, it uses light to target two substances in scar tissue that affect how scars look:

- Hemoglobin, a substance in blood vessels and red blood cells that makes scar tissue look red
- Melanin, the component of skin cells that gives them their color and can create darkened scars

Using IPL, we can destroy hemoglobin and melanin in scars to fade the tissue and make it blend better with the surrounding normal skin. IPL won't completely remove scars from skin grafts, burns, or other serious wounds, but it can lead to huge improvements in the quality of our patients' lives.

Is laser scar revision right for me?

Aside from burns, laser scar revision can help patients with a wide range of scars, including those from traumatic injuries. For example,

I worked with a patient who had painful dog bite scars over a large area of her body since childhood. She found success with laser therapy after plastic surgery and steroid injections didn't achieve the results she wanted. We've also treated patients who wanted to improve the appearance of scars after major surgeries, such as thyroidectomies and skin grafts following soft-tissue infections.

Laser therapy also can be effective to treat wounds that haven't healed fully. Especially in patients who have suffered large burns, it's common for us to see wounds with thick, tight scar tissue that constantly pulls the wound apart and prevents it from closing. This leaves a small ulcer in the center of the wound, which increases the patient's risk for infection. By using the laser on the scarred areas, we often can relieve the tension on the tissue, allowing the wound to close and heal.

Potential risks of laser scar revision.

As with any procedure, some patients might experience complications from laser therapy. These minor issues don't render a patient ineligible, but we have to ensure patients understand the risks before proceeding:

- **Prior chemotherapy with certain older drugs:** Older patients who have had cancer may have been treated with chemotherapy drugs that included gold particles, and our lasers sometimes can react with the gold to turn the skin dark in those areas.
- **Personal or family history of vitiligo:** This skin condition causes discoloration in various areas of the skin. The laser can activate vitiligo in someone who has a dormant case of the condition.

- **Herpes simplex infection:** The laser can activate dormant herpes infections, such as cold sores or genital herpes. We can provide a dose of antiviral medication before a treatment to reduce this risk.

What to expect.

If you are interested in learning more about laser scar revision surgery, we invite you to come to The Burn Center for a consultation. At your visit, we will discuss the above issues, as well as your goals and priorities for treating your scar. You will have a pre-laser scar assessment with one of our burn rehabilitation therapy team members to measure factors such as the color and stiffness of your scar prior to treatment.

On the day of your procedure, you will be treated in the operating room with members of the burn surgery team and anesthesia staff. Patients return home the same day of surgery, and most are back to work or school the next day. You will have a check-up appointment one to two weeks after your procedure to re-measure the color and stiffness of your scar and to gauge any improvement you may have seen. From there, you and your provider will make plans for additional laser sessions, usually spaced four to six weeks apart.

Painful, itchy, or tight scar tissue can make life more difficult for patients as they recover from burns or traumatic injuries. With laser scar revision, we have another tool available to relieve pain, restore motion, and improve the quality of their lives.

Interested in laser scar revision?

Call **202-877-7347** for an appointment with one of our specialists.



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