



# Scar Management in the Pediatric Patient



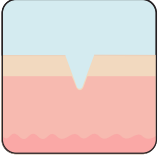
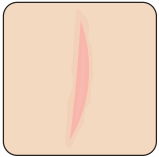
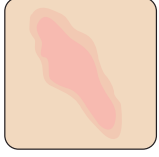

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## Wound-healing and Scar Formation

Scars form when the skin is damaged from a cutaneous insult, including but not limited to: infection, burn, trauma, surgery, and various skin conditions.

Following surgery or injury, it typically takes at least 6 to 8 weeks to start to see a difference in a child's scar. The wound-healing process and scar formation is affected by both genetic and environmental factors. It can take up to 2 years for scars to heal completely.

### Classification of Scars

	<b>Atrophic Scars</b> <ul style="list-style-type: none"><li>• Appear as concave depressions or divots (“ice-pick scars”).</li></ul>
	<b>Hypertrophic Scars</b> <ul style="list-style-type: none"><li>• Excessive collagen but remains confined to original borders of injury.</li></ul>
	<b>Keloid Scars</b> <ul style="list-style-type: none"><li>• Excessive collagen extending beyond original borders of injury.</li></ul>
	<b>Contractures</b> <ul style="list-style-type: none"><li>• When a large area of skin is damaged and lost, the scar formation pulls the edges of the skin together, causing a tight area of skin.</li></ul>

### In-Clinic Evaluation of Scars

During the healing process and after, scars can lead to symptoms. These may result in disruption of daily activities and sleep disturbances. Physical scar signs and symptoms to consider, include:

- |  |  |
|--|--|
| <input type="checkbox"/> Pain/tenderness   | <input type="checkbox"/> Erythema/hypervascularity   |
| <input type="checkbox"/> Pruritis (itching)  | <input type="checkbox"/> Presence/history of infection (folliculitis, cellulitis, abscess, fasciitis) within scar area |
| <input type="checkbox"/> Altered sensation/hypersensitivity                              | <input type="checkbox"/> Presence/history of chronic wound/chronic ulceration within scar area                         |
| <input type="checkbox"/> Skin contracture (function limiting?)                           |  |
| <input type="checkbox"/> Range of motion/functional deficit                              |  |
| <input type="checkbox"/> Dyspigmentation (hypopigmentation, hyperpigmentation, mottling) |  |

Even clinically benign-appearing scars may cause a patient physical, psychological, and social comorbidities leading to severe impairment in quality of life.

Psychosocial scar comorbidities to consider, include:

- |  |  |
|--|--|
| <input type="checkbox"/> Anxiety/stress                | <input type="checkbox"/> Impact on school, work, and/or social performance |
| <input type="checkbox"/> Depression                    | <input type="checkbox"/> Overall perceived reaction of others to scar      |
| <input type="checkbox"/> Posttraumatic stress disorder |  |

## In-Clinic/At-home Scar Management

The goals of therapy for any scar should be established with the patient and focus on:

- Maximizing functional outcomes
- Relieving symptoms
- Reducing comorbidities
- Decreasing scar volume

Non-surgical scar management techniques can be used when the scar is not considered mature to help make it more flat, smooth and flexible, usually makes it less painful and noticeable to the child. These include: scar massage, silicone application, therapy with compression garments and splinting/orthoses, and sun protection.

### Scar Massage

Scar Massage can take place once the burn is considered healed, and your provider has recommend moisturizer. For the first 2 to 4 weeks, the scar can be rubbed gently for 5 to 10 minutes twice daily along the same direction as the scar. Enough pressure should be used to change the color of the scar from pink to pale.

After about 4 weeks, you can begin to massage the scar using different motions: up, down, side to side, circular, pulling apart, pulling outward, folding together, and crisscross. This can be demonstrated in the clinic and taught to the child and/or their caregiver, depending on the child's age.

Fragrance-free oils (e.g. vitamin E oil or cocoa butter), gels (e.g. aloe vera), and lotions (e.g. Eucerine®, Aquaphor®, or Mederma®) can be used to moisturize and soften the scar during massage.

### Silicone Application

Topical silicone gel (or pads) in conjunction with an interim or custom compression garment can be used to improve hypertrophic scars and keloid development.

### Sun Protection and Outdoor Activity

Advise patients and caregivers that sunblock/sunscreen with SPF 30 or greater with UVA/UVB coverage should be used on all scars. It is best for the child to play outdoors in the early morning or later afternoons to decrease the chance of sunburn. Outdoor/sport clothing (e.g. swim shirts, sun hat) may be worn for additional sun protection.

## When to Refer to a Specialist

If the goals of therapy for a patient's scar cannot be achieved using in-clinic/at-home scar management techniques, consider referring the patient to a specialist. This includes keloids, those that cross joints, those with pain or excessive pruritis, and hyperemic scars. Some scars can be improved by certain treatment methods.

## Burn Center at Nationwide Children's Hospital

The Burn Center at Nationwide Children's is an American Burn Association Verified Pediatric Burn Center. In addition to providing comprehensive multidisciplinary care to children with burn injuries and other cutaneous conditions, our team provides collaborative treatment throughout the patient care continuum to optimize patient outcomes. This includes post-burn care and scar management/reconstruction.



# The Burn Center at Nationwide Children's Hospital

## Available procedures to minimize pediatric scars

Our team performs the most comprehensive procedures available to improve pain, appearance, and mobility for pediatric patients. The most common scar-minimizing procedures for different types of scars include:

Scar Type	Scar-minimizing Procedures
<b>Hypertrophic</b>	<ul style="list-style-type: none"><li>• Steroid injections - May decrease the size of the scar and soften the scar tissue.</li><li>• Surgery - Can directly remove the scar formation.</li><li>• Silicone dioxide - Applied as a gel or pad, can help soften and decrease redness.</li><li>• Compression garments – Will assist in decreasing the size and softening scars</li><li>• Laser therapy - Can smooth a scar, remove the abnormal color of a scar, and flatten a scar. Most laser therapy for scars is done together with other treatments.</li></ul>
<b>Keloid</b>	<ul style="list-style-type: none"><li>• Steroid injections - May decrease the size of the scar and soften the scar tissue.</li><li>• Cryotherapy - The cells within the scar are frozen to decrease its volume.</li><li>• Compression garments – Will assist in decreasing the size and softening scars</li><li>• Silicone dioxide - Applied as a gel or pad; can help soften and decrease redness.</li><li>• Surgery - Can directly remove the scar formation; sometimes skin grafts are also used to help close the wound.</li><li>• Laser therapy - Can smooth a scar, remove the abnormal color of a scar, and flatten a scar. Most laser therapy for scars is done together with other treatments.</li><li>• Local Chemotherapy Injection - This is an option for scars that don't respond to other treatments.</li></ul>
<b>Contractures</b>	<ul style="list-style-type: none"><li>• Skin graft or skin flap - Done after scar tissue is removed and can decrease the amount of contractures of the nearby skin.</li><li>• Z-plasty – A skin flap that uses a Z-shaped incision to help decrease the amount of contractures of the nearby skin.</li><li>• Tissue expansion. Increase the amount of existing tissue available for reconstructive purposes; often used in addition to skin flap and/or skin grafting surgery.</li></ul>

**We recommend a referral and are available for further consultation for keloids, burns that cross joints, with pain or excessive pruritis, and hyperemic scars.**

Online: [NationwideChildrens.org/specialties/burn-program](https://nationwidechildrens.org/specialties/burn-program)

Call us at: (614) 722-2000. Fax us at: (614) 722-5767.



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## Referrals and Consultations

The Burn Clinic is located in the Outpatient Care Center at Nationwide Children's Hospital.

555 South 18th Street

Columbus, Ohio 43205

Online: [NationwideChildrens.org/specialties/burn-program](https://www.nationwidechildrens.org/specialties/burn-program)

Call us at: (614) 722-2000. Fax us at: (614) 722-5767.

Need to reach us outside normal business hours (8 a.m. - 4:30 p.m.)? Call (614) 722-3900.

Central Scheduling Phone: (614) 722-6299 or (877) 722-6220 | Fax: (614) 722-5826.

Physician Direct Connect Line for 24-hour urgent physician consultations: (614) 355-0221 or (877) 355-0221.



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