

INVESTMENT IN RESEARCH SAVES LIVES AND MONEY

Burns

A burn is an injury caused by heat, radiation, electricity, friction, or contact with chemicals. The most common burns are thermal (heat) burns.^{1,2} The severity of a burn is based on how deep the burn is and how large an area it covers. First-degree burns damage the outer layer of skin (epidermis), second-degree burns extend to the deeper layer of skin underneath the outer layer (dermis), third-degree burns destroy the hair follicles and sweat glands buried deep in the dermis and extend to the underlying tissue, fourth-degree burns extend into fat, fifth-degree burns into the muscle, and sixth-degree burns to the bone.²

When the body is faced with a large or deep burn, the metabolic and inflammatory responses can overreact, making the injury more severe and harming other organ systems like the heart, lungs, and kidneys. Minor burns are treated with bandages and antibiotics, but more severe burns may need treatment with fluid therapy, removal of the burned tissue, and one or a combination of skin grafts to cover the wound. Serious burns can lead to impaired physical or mental recovery.²

COST⁴

\$1.5 billion:

Annual medical costs associated with burn-related injuries.

\$24,000:

Average cost of burn-related hospital stays, which is 2x the average cost of all other hospital stays.

TODAY

96.7% of patients treated in burn centers survive.³

Between 2011 and 2015, about **486,000** fire or burn injuries were seen at emergency rooms.³

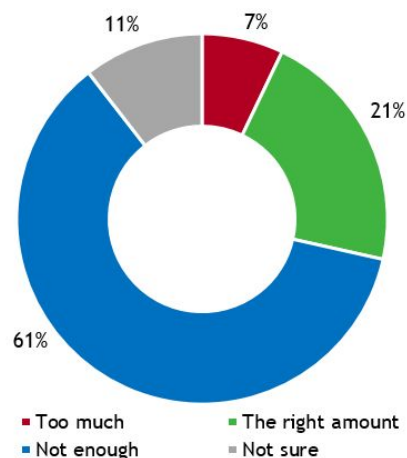
The number of burn-related deaths has declined by over **50%** in the last 40 years.⁴

How important is it for the federal government to incentivize greater private sector investment in new treatments and cures?

Research Delivers Solutions

Patients with serious burns often suffer severe nutrient deficiencies due to hypermetabolism, which can impair immune function and wound healing. Researchers explored the effects of the amino acid **glutamine (GLN)** in burn patients. One study found that patients who received intravenous GLN after a burn injury were three times less likely to have bacterial infections compared to patients who did not receive GLN treatment. This GLN treatment also significantly reduced mortality. These studies may be useful in developing GLN-based therapies in the future for patients with severe burns.⁶

For burn survivors, an important part of the recovery is maintaining flexibility in the healing skin. One study of 23 patients tested the efficacy of using **paraffin wax** paired with sustained stretching to increase skin elasticity. They found that patients treated with paraffin wax and a regular stretching routine had a significantly increased range of motion compared to patients who only participated in stretching. Since many burn survivors experience functional impairment through skin stiffness, this study provides support for a simple, cost-effective therapy.⁷



Source: A Research!America poll of U.S. adults conducted in partnership with Zogby Analytics in January 2020

Burns

Then. Now. Imagine.

THEN

In the mid-1970s, burns covering more than 20% of a person's body were nearly always fatal.⁴

NOW

Those with burns covering 90% of their bodies can survive.^{2,4}

IMAGINE

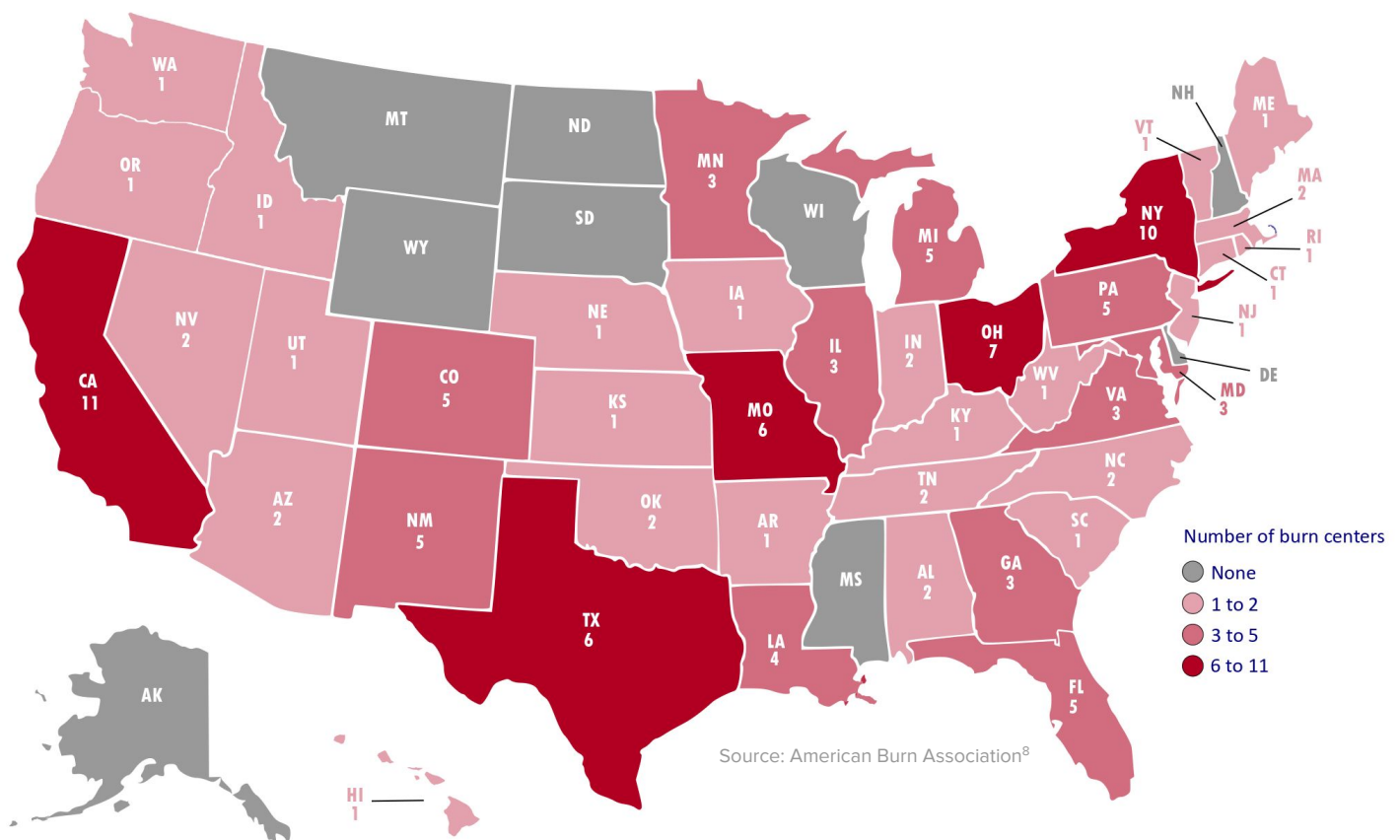
Even more effective post-burn therapies and treatments.

Burn Injuries in Children

Children are especially vulnerable to burn injuries.

Almost **25%** of all burn injuries occur in children under the age of 15.³ An estimated **113,108** children aged 18 and younger were treated for burns in the United States in 2014. Scald burns are the most common cause of burns in the particularly young, usually through tap water that is too hot. The CDC recommends adjusting the temperature settings on hot water heaters so that water does not leave the tap at temperatures above 120°F (48.8°C).^{4,5}

Number of Adult and Pediatric Burn Centers by State



1. "Burns." WHO. 2018.

2. "Burns." NIGMS. 2018.

3. "Burn Injury Fact Sheet." NBAW. 2018.

4. McDermott et al. "Burn-related hospital inpatient stays and emergency department visits, 2013." AHRQ. 2016.

5. "Burn Prevention." CDC. 2019.

6. Wischmeyer, PE. "Glutamine in burn injury." Nutrition in Clinical Practice. 2019; 34(5):681-687.

7. Holavanahalli et al. "Effectiveness of paraffin and sustained stretch in treatment of shoulder contractures following a burn injury." Arch Phys Med Rehabil. 2020. 101(1S):S42-S49.

8. "Burn Center Regional Map." American Burn Association. N.d.

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