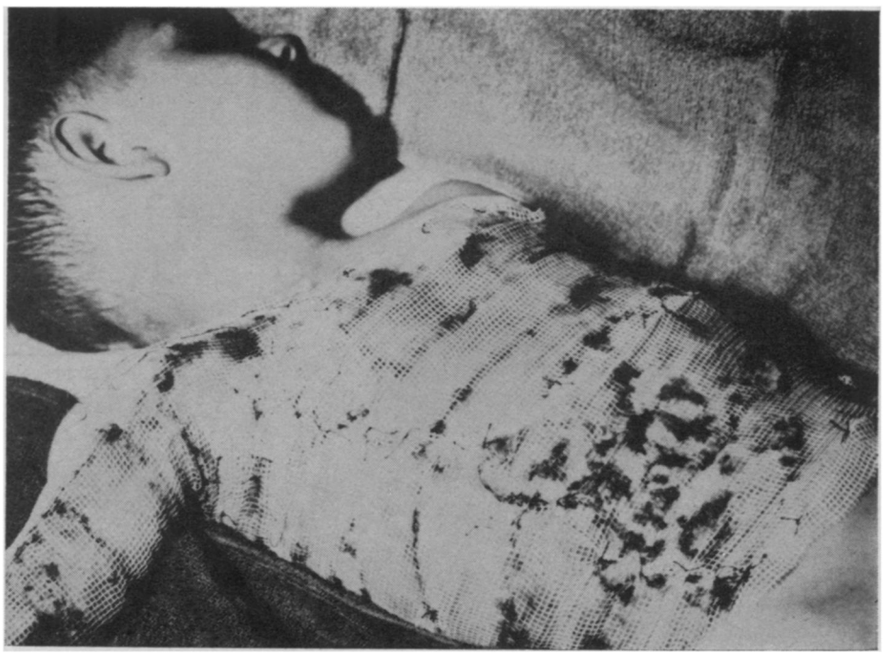
TISSUE DAMAGE



Modified exposure of burn area is one form of treatment.

Treating Burns, Frostbite

Theories about treatment keep changing; what stays is the need for better treatment centers.

by Faye Marley

Treatment for burns, like that for frostbite, has undergone radical changes in the past 10 to 20 years.

Burn therapy has changed from bandages and baking soda in warm water to cold water soaks and exposure to air. A 1943 textbook advised picric-acid gauze as an emergency bandage, and one authority says treatments have ranged from powdered unicorn's horn of the Middle Ages to tannic acid and drugs of a more recent era—all of which have been discarded.

Similarly, it used to be taught that frostbite should be treated by cold water or snow, with rubbing of the frozen parts.

"Applying ice water or snow to a frostbitten limb makes about as much sense as treating a burned foot by putting it in an oven," Dr. William J. Mills Jr., of Anchorage, Alaska, says. "More than likely this traditional method arose from the lessened pain and discomfort during thawing, particularly in superficial injury, and the obviously disastrous results obtained by applying dry heat."

It was probably the effect of excessive dry heat that accounted for the severe gangrenous results reported during Napoleon's retreat from Moscow, a report so often quoted in the cold injury literature that rewarming above body temperature was for many years rejected and only recently received encouragement.

But the most recent BULLETIN ON COLD INJURY, a joint publication by the Army, Navy and Air Corps, says if freezing has occurred and the affected tissue is still frozen, it should be rapidly thawed in a water bath carefully controlled at 104 degrees F., not to exceed 109 degrees F. Rapid warming should not be continued beyond the time when thawing is complete and should not be used if thawing already has occurred.

For nonfreezing cold injuries warming above 98 degrees is not recommended; rapid thawing could cause intense pain.

Smoking is prohibited in all types of cold injury because nicotine causes narrowing of the blood vessels—vasoconstriction—and may further decrease the blood supply to the injured tissue. Mild stimulants such as tea or coffee are useful but alcohol is not recommended because of its variable effect on the surface blood flow.

Tetanus toxide booster is recommended, but unless there is obvious infection, antibiotics for the cold injury itself are not advised at first.

As in burns, "open" treatment should

be given for frost injury and extreme care should be taken to prevent further injury or infection.

During the Korean War Negroes were affected by frostbite more than white soldiers. Two studies since that period have shown that heat-regulating and circulatory responses to cold by Negroes are signficantly different from those by Caucasians and natives of Alaska. It appears that a physiologic basis does exist for the reported higher incidence of cold injury among Negro military personnel.

For burn therapy, unicorn horn is long gone; other treatments are changing rapidly.

One of the most recent treatments for burns has been reported by Col. Robert B. Lindberg of Brooke Army Medical Center in Texas. A sulfonomide-based burn cream, nicknamed "Lindberg's butter," is saving the lives of patients with up to 60 percent burn by preventing the development of massive infections. It is applied to a cleansed burn wound by a hand in sterile rubber glove. No dressing is applied.

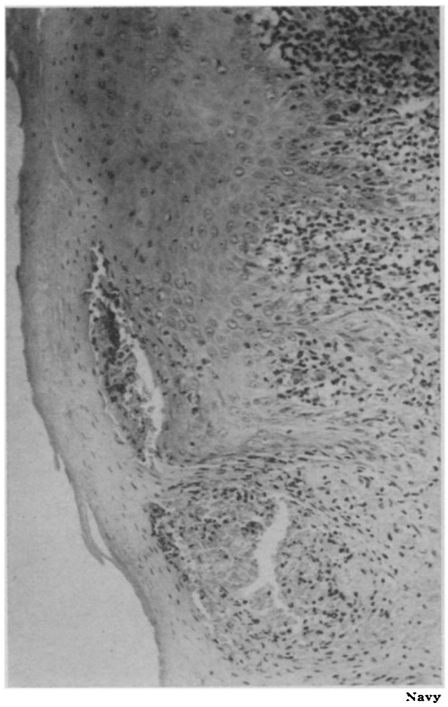
In the past, efforts to control massive infections with antibiotics, exposure of burned area, early cutting away of destroyed tissue and grafting have not lowered the death rate at the Brooke Surgical Research Unit. When antibiotics succeeded in controlling infection by either streptococci or staphylococci organisms, then Pseudomonas aeruginosa, another kind of organism, became the chief offender.

The first dramatic test of Col. Lindberg's cream, after tests on laboratory rats, was on a six and a half year-old boy who had a massive infection of his burn, largely third degree, which covered 41 percent of his body surface. The survival rate for so extensive and infected a burn in such a young child is virtually zero, but he recovered after being treated with the new preparation.

Another treatment in use is silver nitrate in weak solution, initiated by Dr. Carl A. Moyer, head surgery professor at Washington University and surgeon-in-chief, Barnes Hospital, St. Louis, Mo. When burned patients are treated with soaked gauze dressings they lose little body fluid and are free from pain and fever. Such grafting of skin as is needed can be done with little pain, without anesthetics.

For less serious burns, the old wives' favorite butter treatment—or even urine in an emergency—are in total disrepute—though in the past they had some professional advocates.

Cold water is now recommended by a number of doctors for the relief of lesser burns, although some have tried it for deeper ones. Immediately after suffering a burn the person should submerge the skin in cold water, usually



Navy

Tissue damage: a third degree burn.

under 70 degrees. Add ice to keep the water cold as it will absorb the burn heat. On burned parts that cannot be immersed, cloths may be applied soaked in ice water and changed constantly at first. Treatment should be continued until pain stops when the burned part is exposed to the air.

If a burn is bad enough to require medical treatment it is advisable not to put baking soda or greasy ointment on the area because doctors will have to scrape it off. Pain may be lessened by these home remedies, but healing is not promoted, and if the substances are not sterile they can contribute to infection.

Dr. Charles L. Fox Jr. of Columbia University College of Physicians and Surgeons says there are too few highly specialized burn centers equipped to handle complications such as blood poisoning, overhydration, pulmonary edema, anemia, malnutrition or gastrointestinal bleeding. Modern installations and a highly experienced staff of physicians, surgeons and scientists concentrating exclusively on burn problems are often life-saving.

A receiving hospital's first problem is to evaluate the degree of injury and provide emergency treatment of shock, and its second is to arrange for the fastest possible transfer of the patient to a center more completely equipped to meet his needs. Dr. Fox says:

"No doctor should have any illusion about the necessity of this step—especially if more than 40 to 50 percent of body surface is involved, a situation in which only a minority of patients can be expected to survive."