MEDICINE

Better Care for Burn Victims

Of all bodily injuries, few are more traumatic than burns. By searing through flesh and muscle, destroying nerves and blood vessels, and setting up a fertile breeding ground for infection, burns can cripple, disfigure and kill. Last year alone, approximately 7,500 Americans, 1,800 of them under age 15, died of burns. Although this toll is fearsome, the number of burn deaths has remained relatively constant while the population has increased, and the recovery rate from serious burns has improved significantly. The reason: better care for burn victims.

Since 1947, twelve U.S. hospitals have opened well-equipped burn centers to carry on research and teaching programs and provide victims with the specialized treatment their injuries require. Another twenty hospitals have established smaller "burn units" in which only burn victims will be handled, while at least 46 others have instituted specific courses of treatment for burn patients. All of the institutions are making use of several recent advances in burn-treatment techniques:

▶ Topical creams or burn dressings containing silver sulfadiazine and sulfa derivatives are being used in addition to the traditional method of sterilization —bathing burns with 0.5% silver nitrate solution. The new dressings cut the rate of infection by pseudomonas bacteria—once the primary cause of burn deaths—in half. In addition, Dr. Irving Feller of the University of Michigan burn center in Ann Arbor has developed a treatment that combines infusions of blood plasma from immunized donors with shots of anti-pseudomonas vaccine. The treatment, which has been in use since 1965, has cut the infection death rate from 32% to 9%.

▶ Better wound coverings have also improved burn victims' prospects by preventing excessive loss of essential fluids, which lowers resistance. Doctors, who routinely take skin from animals and cadavers to cover serious burns, are now using the victim's own skin. Physicians at the Brooke Army Medical Center in San Antonio use skin patches taken from unburned areas of the patient's body. Stretched so that they cover as much as nine times their original area, the dressings help prevent the formation of scar tissue and hasten the growth of new skin.

▶ Some of the worst aftereffects of burns —scars and crippling skin contracture —have been minimized or eliminated by techniques now in use at the Burns Institute of the Shriners Hospital for Crippled Children in Galveston, Texas. There, doctors have found that prompt application of lightweight plastic casts keeps burned flesh from contracting as it heals; pressure bandages kept in place 24 hours a day control the buildup of scar tissue and prevent the formation of disfiguring welts. As a result, burn patients who might once have had to undergo a long series of corrective and cosmetic operations can now avoid surgery in three out of four cases.

U.S. ARMY

DOCTOR USING SKIN TO COVER BURN
The best treatment is to cool it.

Despite such advances, doctors continue to stress that prompt first aid—before the victim reaches the hospital—can reduce both the scope and the seriousness of many burns. The best treatment, they agree, is to cool the burn immediately. Prompt immersion in cold water, says Dr. John Moncrief of the University of South Carolina, has the same effect on a burn as on a lighted match: it "puts out the fire." Equally important, the burn is prevented from spreading, thus minimizing both the damage and the discomfort, maximizing the prospects for recovery.

In Defense of DDT

In the nine years since Rachel Carson's book *Silent Spring* first documented DDT's disastrous effects on animal life, environmentalists have carried on a determined campaign against the potent pesticide. The U.S. Government has responded to their efforts by restricting the use of DDT. Several states have gone even further, banning the chemical completely. But DDT still has its defenders. The World Health Organization, admittedly more concerned with public health than conservation, has warned that a ban on DDT spraying could doom worldwide malaria-eradication efforts, which in the past years have freed more than 1 billion people from the debilitating disease.

In sounding the alarm, which should give pause to even the most ardent environmentalists, WHO pointed to the experience of Ceylon, located off the southern tip of India in a tropical climate ideal for the breeding of the malaria-carrying Anopheles mosquito. There, a concentrated campaign of DDT spraying cut the incidence of malaria from 2 million cases in 1946 to only 110 cases in 1961. But after Ceylonese authorities, considering the battle won, dropped the spraying program, the disease returned with a vengeance. During 1968 and 1969, it afflicted 2.5 million people.

Packaging for Preemies

THRUST out into the world before they are ready, premature babies must be kept warmer than full-term infants if they are to survive. Thus, hospitals have long placed preemies in temperature-controlled incubators, where some cooling occurs each time the baby is fed or treated. Now there is another way. After experiments with hooded bags of the bubbled, air-pocketed polyethylene material used to package glassware, a team of researchers at the University of Cincinnati Medical Center has found that the stuff can prevent damage to kids as well as to merchandise. In a test involving 85 newborn babies, they discovered that the temperatures of unpackaged infants fell by more than 2° during the first 40 minutes of life. But the temperature drop was only half as much for babies placed in the bubbly bunting within minutes of birth.

NEW ENGLAND JOURNAL OF MEDICINE

graduate review

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Here is the first of a continuing series designed to aid the EMT in evaluating his knowledge of emergency care procedures.

Each issue will feature review cases and exercises directed at the first level EMT—researched and developed by David A. Gallup, Ed.D., Assistant Professor of Medicine and Educational Specialist, and registered EMT, employed by the Office of Medical Education at Hahnemann Medical College and Hospital in Philadelphia, Pennsylvania. Thomas W. Bonekemper, M.D., Assistant Professor of Medicine and Coordinator of Primary Care at Hahnemann checks the cases for authenticity and appropriate emergency care; John R. Boker, Ph.D., Assistant Professor of Medicine at Hahnemann and an Educational Psychologist, is involved in writing and setting the cases up for self-review.

At the end of each column, commentary will be provided by an expert in the field reviewed.

You are invited to submit your comments and suggestions for future topics to *Emergency Medical Services*, Review and Evaluation, 15300 Ventura Blvd., Suite 301, Sherman Oaks, California 91403, or telephone 213/990-8393.

The following are actual cases involving emergency medical care of burns. They present an opportunity for self-evaluation and review. As a result of working through them, you should be able to

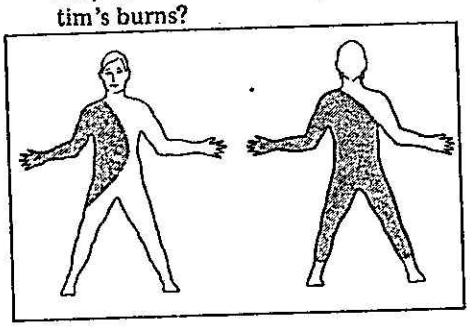
- Describe the emergency care for thermal, chemical, and electrical burns.
- Use the Rule of Nines to determine the severity of a given burn.
- Differentiate between the severity of burns.

Case I: A 15-year-old male was joy riding in his parent's car, driving on the wrong side of the road, when he met an oncoming vehicle head-on. The driver of the other car was killed on impact. The youth was trapped in the wrecked car when the gasoline tank exploded. Initial examination revealed minor lacerations and abrasions as a result of the impact. No fractures were detected. Burns were sustained on the posterior aspects of the legs, thighs, buttocks, and back. The burns also involved the left lateral aspect of his chest and abdomen, left arm, forearm, and hand.

1. What emergency burn care should the E.M.T. administer once the victim has been removed from the vehicle?

2. You would expect this patient to have burns of what degree?
   A. ___ 1st degree
   B. ___ 2nd degree
   C. ___ 3rd degree
   D. ___ all degrees would probably be exhibited

3. The diagram below illustrates the area covered by the burns. Using the Rule of Nines to notify the hospital ER, what is the severity of the victim's burns?



4. During transportation to the ER the victim complains of thirst. You should
   A. ___ give the patient a drink of water
   B. ___ let the patient suck on ice cubes
   C. ___ give nothing by mouth

Case II: An 18-month-old child has bitten through a household electrical cord. He has a third degree burn around his mouth.

5. What is the severity of this burn?

6. Electrical burns may result in paralysis of the breathing center and ventricular fibrillation. It may be necessary to initiate

7. An electrical burn is most often accompanied by a
   A. ___ thermal burn
   B. ___ chemical burn

8. After life support is initiated and accompanying burns extinguished, victims sustaining an electrical burn should be examined for

Case III: A 24-year-old female working as a research chemist in a large industrial plant has spilled acid on her left hand. She has started to flood her hand with copious amounts of water.

9. What is the normal emergency care for the majority of chemical burns?

10. An exception to the normal emergency care for burns is in dealing with carbolic acid. What is the emergency care you would institute for this type of acid burn? Why?

11. In dealing with powdered forms of chemicals, particularly lime, the initial emergency care procedure would be to
   A. ___ lavage with copious amounts of water
   B. ___ do nothing, transport immediately
   C. ___ brush the powdered chemical off, lavage with copious amounts of water

12. What class of chemical inflicts the deepest and longest lasting burns?
   A. ___ acids
   B. ___ alkalis

13. In chemical burns affecting the eyes, what should be done before instituting any emergency care?

14. Please complete the following chart, giving the appropriate percentage of total body surface affected. Write the answer on the line beside each letter.

Severity/ degree	1st degree	2nd degree	3rd degree
Minor	A. ___	B. ___	C. ___
Moderate		D. ___	E. ___
Critical		F. ___	G. ___

15. Exceptions to determining severity of burns would involve the following body areas or injuries:

Answers are on page 100

The following bibliography can be consulted by the EMT for information about the emergency care of burns.

BIBLIOGRAPHY

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Miller, Robert and Cantrell, James. *Textbook of Basic Emergency Medicine.* St. Louis: The C. V. Mosby Co., 1975.

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Commentary on Emergency Management of the Burn Patient

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The emergency management of the burn patient many times can mean the difference between survival and death of a patient. Medical personnel who render emergency care at the scene of a fire should keep in mind a few important points.

First and foremost, smoldering clothing and skin should be cooled immediately to extinguish the fire and cool the temperature of the smoldering skin. The depth of the burn is relative to the intensity of heat and the duration of time it is in contact with the skin. Cool wet towels should not be placed on the patient for more than 10 minutes, and the patient should never be packed in ice. The airway should be checked for debris, cleared, and nasal O_2 started. If the capability exists, an intravenous of Lactated Ringers solution should be started. The patient should be covered with a clean or sterile sheet. No topical ointments should be applied to the burn wound. Patients with 20% or greater burn wounds will most likely require a nasogastric tube when they arrive at the hospital. This is necessary because of paralytic ilius, which may lead to vomiting and possible aspiration of vomitus. Therefore, fluids by mouth should be withheld in large burns.

In summary, douse the clothing which is still on fire; cool the skin briefly with cool wet towels if possible; check airway; start nasal O_2; start IV with Lactated Ringers solution; cover with sterile sheet; transport to hospital.

ANSWER KEY

1. Remove clothing
   Maintain airway
   Treat for shock
   Cover with clean, sterile dressing
   Apply cool, sterile water if possible
2. D. All degrees would probably be exhibited
3. Critical
4. A. Give nothing by mouth
5. Critical
6. CPR
7. A. Thermal burn
8. Exit wound or second burn
9. Remove clothing
   Flood affected area with water
10. Flood with alchohol
    Carbolic acid is not water soluble
11. C. Brush the powdered chemical off, flood with copious amounts of water
12. B. Alkalis
13. Check for contact lenses and if present, remove
14. A. $<20\%$
    B. $<15\%$
    C. $<2\%$
    D. 15-30%
    E. $<10\%$
    F. $>30\%$
    G. $>10\%$
15. Face, hands, feet, respiratory tract, fractures, soft tissue injuries ●

WORKING FOR HEALTH IN PROFESSIONAL CIRCLES 93-S, 94-S

Baltimore City Health Department

A moving series of circles in the center of the exhibit will draw attention to two boxed wings with transparencies lighted from inside. Each wing will show ways the City Health Department is working with private physicians, laboratories and hospitals to reduce sexually transmitted disease and pediatric problems. Information and other City Health Department services will be available in pamphlet form.

THE MARYLAND INSTITUTE FOR EMERGENCY MEDICINE 96-S

Maryland Institute for Emergency Medicine

The exhibit describes the Maryland Institute for Emergency Medicine (formerly) the Center for the Study of Trauma), which works closely with the State EMS program to provide continuity of care from the notification of the accident, resuscitation at the scene, transportation, definitive care, and rehabilitation. MIEM also advances education and research in the areas of trauma and emergency medical services. In addition, the display provides information on the newest methods of therapy for the critically injured and on research and instruction in emergency medical care.

THE "GIFT OF LIFE" PROGRAM—ORGAN DONATION AND DONOR MANAGEMENT 97-S

Kidney Foundation of Maryland

The Kidney Foundation of Maryland's "Gift of Life" Organ Donor Program encourages people to make a post-mortem donation of their kidneys by signing an organ donor card, a legal document expressing an individual's desire to have his or her kidneys used for transplantation. Over 100,000 Marylanders have signed an organ donor card and given a "gift of life."

A major problem facing Maryland's transplant surgeons is the early identification and management of the potential donor. The Kidney Foundation's exhibit explains the procedures and operation of the state's transplant teams and shows, via slides and protocols, how each physician can assist in this humanitarian effort.

THE MANAGEMENT OF BURNS 98-S

J. H. Wells, MD, A. Munster, MD, F. Freshwater, MD, C. T. Su, MD, Baltimore Regional Burn Unit, Baltimore City Hospital

The exhibit will outline the new Baltimore Regional Burn Unit recently opened at Baltimore City Hospital. This will outline the ten bed unit showing the current management of major burns. This unit is the only one of its kind in the State of Maryland and consequently receives burns from the entire State, neighboring areas of West Virginia, Pennsylvania and Washington, D.C. In addition it has received burns from Bermuda. The exhibit will outline the current management from the point of burn injury, transportation to the burn unit via the State medical emergency evacuation system, admission of patient to the unit, initial management of the burn, surgical debridement, grafting, ultimate rehabilitation and ultimate discharge.

MEDICAL DISSOLUTION OF GALLSTONES 99-S

Richard Baum, MD, Frank Iber, MD, Division of Gastroenterology, University of Maryland Hospital

This exhibit will illustrate the physical and chemical properties leading to gallstone formation, and it will explain the mechanisms whereby chenodeoxycholic can bring about gallstone dissolution.

Finally, the exhibit will explain the nationwide double blind controlled study of gallstone dissolution being carried out in part at the University of Maryland under the sponsorship of the National Institutes of Health.

OUTPATIENT ANTICOAGULATION MANAGEMENT 100-S, 101-S

Faith B. Davis, MD, Gustav C. Voight, MD, Myrna T. Estruch, MD, Baltimore City Hospitals and SUNY at Buffalo

A general hospital Anticoagulation Service (ACS) has provided safe, consistent and uniform monitoring of long-term oral anticoagulation with low hemorrhagic morbidity and no hemorrhagic mortality. Careful patient selection, education, attention to duration of anticoagulation, and communication with patients' primary physicians all contribute to the success of the ACS.

THE "SCOPE" OF SURGICAL ENDOSCOPY AT THE UNIVERSITY OF MARYLAND HOSPITAL 102-S

T. Eisenstat, MD, Department of Surgery, University of Maryland School of Medicine

The exhibit will include a pictorial description of the various endoscopic modalities presently in use at the University of Maryland

Included will be Colonoscopy, Gastroscopy, Laparoscopy and Endoscopic Retrograde Colangiopancreatography.

Additionally a slide presentation will demonstrate some of the pathological conditions encountered.

SCIENTIFIC EXHIBIT 103-S, 104-S

Maryland Thoracic Society

The exhibit is divided into three sections. One section will contain printed literature which will describe the purpose and program of the Maryland Thoracic Society, the program of free consultation to hospitals on the development of a respiratory care program. Section two will display a chart of the components of a model respiratory care department. Section three will contain a display of pulmonary function laboratory equipment, but will not promote the sale of that equipment. The exhibit will be manned at all times by members of the Maryland Thoracic Society.

STATE OF MARYLAND, DIVISION OF EMERGENCY MEDICAL SERVICES 107-S

The exhibit explains the components of the State of Maryland Emergency Medical Services system. These include the newest developments in communications, transportation, treatment facilities, training, continuing education of emergency medical care personnel, and information to educate the general public about their role in EMS. The display includes visual, audio-visual, and printed materials.

MOBILE INFORMATION CENTER Parking Lot

State of Maryland Division of Emergency Medical Services

The Maryland EMS Mobile Information Center contains photographic display panels explaining the latest developments in communications, transportation, treatment facilities, training, continuing education of emergency medical care personnel, and public information and education. Also included are an immediate feed-back quiz on medical self-help skills, audio-visual presentations, a display of tools of the trade, and information on regional EMS activities.