

# NIDRR Model Systems for Burn Injury Rehabilitation Child Facts and Figures

March 2003

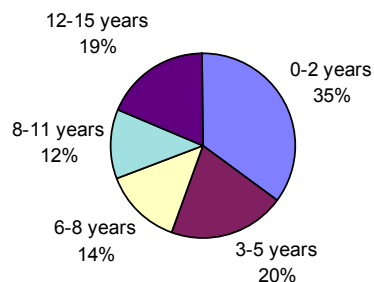
Since May of 1994, five burn centers have participated as Model Systems for Burn Injury Rehabilitation funded by the National Institute of Disability and Rehabilitation Research in the Department of Education (NIDRR). Four Model Systems are currently collecting data: the University of Washington (1994-2003), the University of Texas Southwest (1994-2003), Johns Hopkins University (1997-2003), and Shriners Burn Hospital in Galveston (1997-2003). The University of Colorado Health Sciences Center also contributed data from 1994 to 1997. Each center currently collects data on both adults and children. Data on children has been collected by the group since 1997 and the largest contributor of subjects under 16 is the Shriners Burn Hospital. Data presented here were collected through February 1, 2003 and include 1263 children. In order to be eligible for the study, Model Systems patients must consent to follow-up for at least two years, and meet the American Burn Association criteria for a major burn injury. The ABA defines a major burn injury as a burn covering at least 5%, 10% or 20% of the body (depending on burn severity and age), a burn causing a functional or cosmetic threat, an electrical burn, a burn with inhalation injury, or a circumferential burn.

## Demographics

### Age

Of the entire combined burn population, 68% are adults (16 and older), and 32% are children (under 16). The mean age at injury for children is 6 years. The breakdown of subjects by age group is shown below in Figure 1. The largest number of subjects (35%) were ages 0-2 at the time of injury, and the second largest group (20%) were in the 3-5 year old age category.

Figure 1: Age at Injury



### Gender

Sixty-six percent of all subjects under 16 in the Model Systems are male. When examined by age group, the gender distribution varies from a low of 55% male in patients from 6 to 8 years old, to a high of 83% male in 12 to 15 year olds.

### Residence

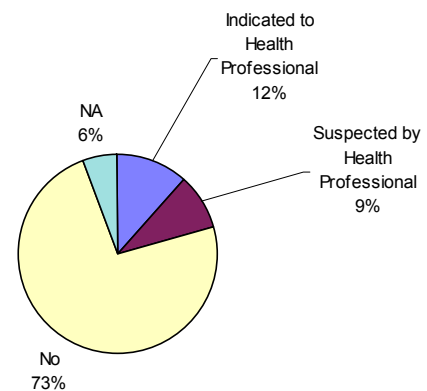
Most patients (76%) lived in a house at the time of their burns. Fifteen percent lived in an apartment and 7% were living in a mobile home. A very small proportion of the patient

population was homeless or in an institution at the time of burn injury (less than 1%).

### Risk Factors

Data on several risk factors in the burn patients' family environments are collected by the Model Systems. Of all burn patients under the age of 16, 12% were under child protection (as indicated directly to a health professional), 9% of the patients were suspected to be under child protection. Child protection status is summarized in Figure 2 below. Only 4% of patients or their families indicated that substance abuse was a problem in the family environment, and in 1% of cases substance abuse in the family was suspected by a health care professional. Six percent of burn patients or their families indicated that psychiatric illness existed within the family environment. In 1% of cases, psychiatric illness was suspected by the health care professional.

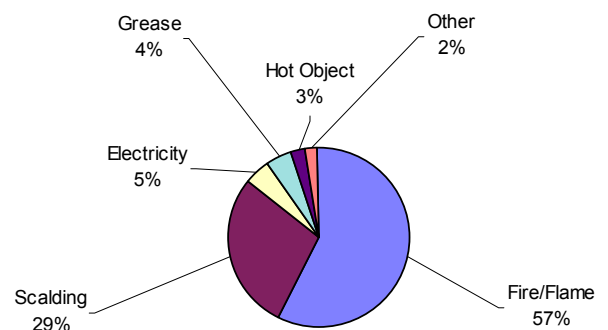
Figure 2: Child Protection



### Primary Etiology of Injury

Fire/flame was the most common cause of injury for Model Systems patients; 57% percent of injuries were caused by fire or flame. Scalds accounted for 29% of burn injuries in our population and electricity caused injury in 5% of patients. The most common burn etiologies are shown in Figure 3. The category labeled 'Other' in the figure consists of flash burns (~0.65%), tar burns (<0.5%), chemical burns (<0.5%), UV light (<0.5%), frostbite (<0.5%), skin disease (~0.81%), abrasions (<0.5%), and other causes (<0.5%).

Figure 3: Primary Etiology



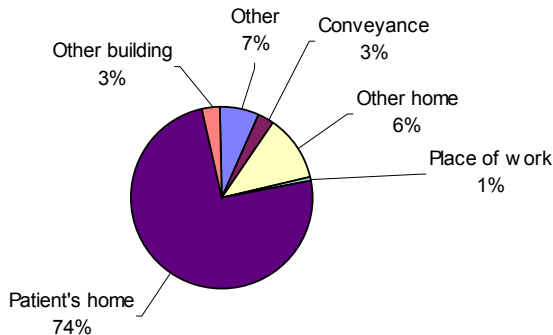
### Indoor/Outdoor Location

Sixty-two percent of burns occurred indoors, in an enclosed space, where the chances of suffering an inhalation injury are much greater.

### Geographic Location

The breakdown of geographic location of burn injury is shown in Figure 4 below. Almost three quarters (74%) of the patients in the Model Systems were burned in their own homes. Six percent of patients suffered the burn injury at a home other than their own and 3% of burns occurred while in an automobile, plane or train (conveyance).

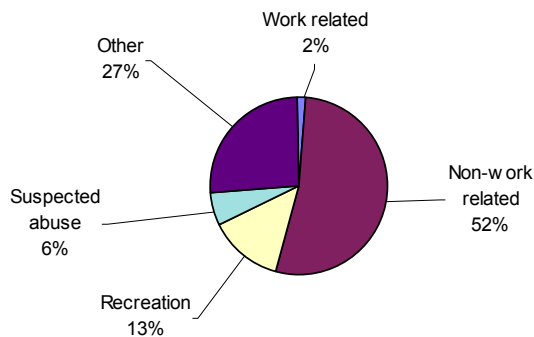
**Figure 4: Where Injury Occurred**



### Circumstances

Thirteen percent of all children had burns that occurred during a recreational activity. Six percent of burns in the child population were possibly the result of abuse. See Figure 5 for a summary of Injury Circumstances information.

**Figure 5: Circumstances of Injury**



### Severity of Injury

When measuring the severity of a burn injury, one needs to consider factors such as total body surface area burned (TBSA), whether or not skin grafting was required, and whether an inhalation injury occurred. The mean TBSA for all patients under 16 is 30%, and of all burn etiologies, skin disease had the highest mean TBSA (48%). Table 1 lists the mean and standard deviation for TBSA by burn etiology. Seventy-six percent of children in the Model Systems required grafting on some area of their body (this calculation excludes patients who survived fewer than 3 days). Burn patients who

sustain inhalation injuries have a significantly reduced chance of survival. Sixteen percent of the Model Systems patients under 16 suffered an inhalation injury.

**Table 1: Total Body Surface Area Burned**

Burn Etiology	Mean	Standard Dev.
<b>All burns</b>	30%	22
<b>Skin Disease</b>	48%	29
<b>Fire/Flame</b>	34%	23
<b>Electricity</b>	29%	21
<b>Scald</b>	24%	17
<b>Grease</b>	21%	19
<b>Flash</b>	15%	7
<b>Other</b>	13%	8
<b>Contact with Hot Object</b>	9%	9
<b>Chemical</b>	8%	5
<b>Abrasion</b>	6%	(n=1)
<b>Tar</b>	5%	(n=1)
<b>Frostbite/Cold</b>	2.5%	(n=1)

**National Institute on Disability and Rehabilitation Research**  
*Project Officer:* Theresa SanAugustin, M.D.

**Burn Model Systems/Data Coordinating Center**  
 Department of Preventive Medicine and Biometrics  
 University of Colorado Health Sciences Center, Denver CO  
*Project Director:* Dennis Lezotte, Ph.D.  
*Project Coordinator:* Rebecca Sloan, BA (303) 315-0320

**North Texas Burn Rehabilitation Model System**  
 University of Texas Southwestern Medical Center, Dallas TX  
*Project Director:* Karen Kowalske, M.D.  
*Project Co-Director:* Phala Helm, M.D.  
*Project Coordinator:* Radha Holavanahalli, Ph.D. (214) 648-3654

**University of Washington Burn Injury Rehabilitation Model System**  
 University of Washington, Harborview Medical Center, Seattle WA  
*Project Director:* Loren Engrav, M.D.  
*Project Co-Director:* David Patterson, Ph.D.  
*Project Coordinator:* Gretchen Carrougher, R.N., M.N. (206) 731-2933

**Pediatric Burn Injury Rehabilitation Model System**  
 University of Texas Medical Branch/Shriners Burns Hospital, Galveston TX  
*Project Director:* David Herndon, M.D.  
*Project Co-Director:* Patricia Blakeney, Ph.D.  
*Project Coordinator:* Judy Wilkins, R.N. (409) 770-6627

**Johns Hopkins University Burn Injury Rehabilitation Model System**  
 Johns Hopkins University, Bayview Medical Center, Baltimore MD  
*Project Director:* James Fauerbach, Ph.D.  
*Project Co-Director:* Barbara deLateur, M.D.  
*Project Coordinator:* Monica Neel, Psy.D. (410) 550-7812

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