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Back to the Future: The ABA and Burn Prevention

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Over the last quarter century, great strides have been made in the treatment of trauma and burns. Mortality has fallen to levels never thought possible. Survival with large burns, at least for now, appears to have leveled off. With probit survival curves, the LA50 for patients by age in one large series are as follows: older than 70 years, 30% total body surface area (TBSA); 60 to 70 years, 50% TBSA; 20 to 30 years, 80% TBSA, and 2 to 5 years, 75% TBSA.1 It is not unheard of for children with greater than 98% TBSA burns to survive.2 Medical historians have observed that when therapies are inadequate, we look toward prevention. To quote this years’ prevention recipient, Dr Ann Philips, “the ABA [American Burn Association] has always been 95% treatment and 5% prevention.”3 I do not find fault with those who stood at the bedside and felt helpless when confronted with the burn victim not so many years ago. The place for the physician was, as is still the case, at the bedside. Many of these physicians, in conjunction with basic scientists, sought answers to clinical problems in the laboratory. Prevention was not as important as patient care though.

Dr Salisbury’s presidential address in 1992 was titled “Burn Rehabilitation: Our Unanswered Challenge.”3 He stated, “This should be a time for rejoicing, for patting ourselves on the back for a job well done, and for looking forward with confidence and vigor to the last leg of the race, which is effective rehabilitation of patients who have sustained thermal injury.”3 It’s premature for the burn community to believe the finish line is rapidly nearing. In the words of our 25th president, Dr Glenn Warden, “the problem of burn prevention is basically quite simple. We do not have sufficient time to devote to the problem and, realistically, being involved with burn prevention will not advance our academic careers.”4 Well, I would venture to say most people who have devoted their time and effort to prevention activities were not and are not now in it for academic promotion. Out of the 14 recipients of the burn prevention award, only 2, I repeat 2, are medical doctors, Dr Paul Silverstein and this years’ recipient, Dr Ann Philips. Our race is not yet finished. Over the last 32 years, prevention efforts have surged from the starting gate, often looked like winners, only to stumble and nearly fall but recover and resume the race.

Since the inception of the ABA, much has happened in the organization. The membership has always represented a diverse group of professional people. The team concept was embraced from the outset. Throughout most of the ABA’s short history, nonphysicians have made up the majority of the membership. And the nonphysician members have done the most to promote prevention. It is important to trace the past history of the ABA and burn prevention to understand our present prevention commitment and hopefully to define the future role of the ABA and prevention. The best way to uncover the past role of prevention in the organization is to follow prevention activities at the national meeting, with an occasional digression where suitable to discuss prevention in general.

Many members of the organization are unaware of the terrible outcomes of burns in the 1950s and 1960s. The burn mortality rate was high, its pathophysiology was poorly understood, and treatment was woefully inadequate. Rittenbury et al5 reported on 1831 patients with burns treated at the Medical College of Virginia between 1949 and 1962.5 The mortality rate was 7% for 0% to 19% TBSA burns, 68%

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for 20% to 39% TBSA burns, 86% for 40% to 59% TBSA burns, and 100% for 60%+ TBSA burns.

Thirteen surgeons with a common interest in burns met in 1959 in San Antonio, Texas. Yearly meetings continued and became known as the National Burn Seminars. The concept of burn prevention was not a "hot" topic at any of these meetings. By 1966, the meeting had become large enough that a planning committee was organized to create bylaws for a national burn organization. The constitution and bylaws of the American Burn Association were ratified at the 8th and last National Burn Seminar in 1967. Modified only slightly over the years, the association objectives are to promote the art and science of burn-related research, teaching, care, prevention, and rehabilitation. One of the original standing committees was prevention. An important burn event, external to the ABA, occurred in 1968. By federal mandate, the National Commission on Fire Prevention and Control was established to investigate the fire problem in the United States. I will return to this commission later.

The first annual meeting of the newly formed ABA was held in Atlanta, Georgia, March 14 to 15, 1969. Three papers were presented that, as one looks back, addressed burn prevention. The National Burn Information Exchange by Feller and Marland, Department of Health Education and Welfare, presented "Effect of Federal Legislation on Burns Involving Inflammable Fabrics," and K Crane and Feller presented "The Burn Problem in the United States." These papers dealt with three basic prevention strategies—data collection, epidemiology, and intervention.

The first papers with the words burn prevention in the title were presented at the second annual meeting (April 10-11, 1970). These were "Etiology and Prevention of Burns," coauthored by the second and sixth presidents of the ABA, Drs Boyd W Haynes and Bruce MacMillan, respectively. The other paper was titled "An Approach to the Prevention of Injuries to Residents in Single and Multiple Family Dwellings." The first burn prevention committee was chaired by Dr George F. Crikelair. In 1970 less than 5% of US households had a smoke detector.

In the early 1970s President Richard Nixon directed the National Commission on Fire Prevention and Control to report on the nation's fire problem. This culminated in a report titled "America Burning," which was published in 1973.6 The report highlighted the high cost in lives and dollars as a result of fires in the United States. In 1974 the US Fire Administration and the National Fire Academy were created. Several important recommendations were made, which are still very relevant today: (1) there needs to be more emphasis on fire prevention, (2) Americans must be educated about fire safety, (3) the environment in which Americans live and work has unnecessary hazards, (4) fire protection features of buildings need to be improved, and (5) fire research is being neglected. Of note, the only burn physician appointed to the committee was Dr Ann Phillips. She was so unhappy with certain conclusions that she wrote a minority report. In it she expressed a variety of concerns with the budget, allocation of resources, and prevention efforts.

At the third annual meeting in San Antonio, Texas, April 16 to 17, 1971, a paper titled "Flammable Fabrics: A Hazard to the Consumer" was presented by Feller. He used the resources of the National Burn Information Exchange (NBIE), the first burn data repository, to analyze 8400 burn injuries; 5000 were flame burns and 80% were associated with flammable fabrics. Schmitt presented "Some Behavioral and Social Aspects of Severe Burn Accidents in Children." Most children engaged in non-play behavior, 88% of the burn accidents were self-instigated, 15% of the children were burned by some environmental defect, and the presence of other people nearby did not preclude a burn injury. Hartford presented "Patterns of Thermal Injury From Clothing Fires." With the use of a mannequin, a reproducible model of clothing fire was developed. The effects of a sash or belt and running and the protection afforded by underclothing were discussed with slides and a movie.

At the fourth annual meeting in 1972, the Burn Prevention committee was listed in the program. Dr Crikelair presented an experimental study with the use of a mannequin with thermocouples to record the temperatures at various locations with the use of gasoline on flammable and nonflammable dresses. The ABA added the word prevention to the logo in 1972.

At the fifth annual meeting (April 6-7, 1973), the breakfast sessions were instituted. One was titled "Socio-economic Factors: Prevention"; it enlisted community support and education, both lay and professional. The prevention papers were initially placed in the associate sessions.

At the seventh annual meeting in 1975, the first burn prevention plenary session was instituted. Bent Sorensen, MD, gave the Everett Idris Evans Memorial Lecture. This honor is given to an outstanding scientist in burns from outside the United States. The paper was titled "Prevention of Burns and Scalds in a Developed Country."7 Sorensen emphasized that there are major and minor forms of burn prevention.
Major prevention involves few patients, with great suffering, and is associated with great expense. Therefore those patients represent a big problem. Prevention of minor burns means involvement of many patients, with little suffering, and small expense; and these patients also represent a big problem. The qualities associated with an effective prevention program include (1) recording of who, where, how, and how many; (2) centralization, which means that a burn unit with its patient base is the best qualified to determine epidemiologic data; (3) an agenda or action plan, which includes action against public authorities and business firms and informative education of the public; and (4) results of action, which is the evaluation of changes in the incidence of burns.

At the ninth annual meeting in 1977 (March 31-April 21), important papers that dealt with prevention included “Hot Tap Water: A Significant But Unappreciated Hazard,” “A Regional Burn Survey,” “Burn Center/Fire Department Joint Effort in Prevention Education,” and “Smoke Detectors A Life Saver.” The latter was presented by Mat Maley, the first recipient of the prevention award. At this time, an estimated 22% of households in the United States had smoke detectors.

At the 10th annual meeting in 1978 (March 30-April 1), prevention papers included “Child Abuse,” “A Survey of Consumer Knowledge and Attitude Concerning Flame Retardant Clothing,” and “Children’s Sleepwear-Flammability Standards: Have They Worked?” In addition, a heretofore unprecedented event occurred: the burn prevention program was allocated an entire afternoon. It was moderated by the burn prevention chairman, Dr Paul Silverstein. Papers presented included “The NBIE: A Scientific Method to Study Etiology and Guide Prevention Strategies,” “One Program—Three Purposes: Medical Education, Burn Prevention, Patient Rehabilitation,” “Home Sweet Home: Our Most Hazardous Environment,” “Fire and Burn Prevention: A Community Approach,” “Burns, Boston 02114: A Four Phase Public Education Campaign,” “A Systematic Method For Identifying Burn Injury Prevention Options,” “Fire/ Burn Prevention Programs From a National Perspective,” “Public Education Program Planning,” and “Don't Wait Until You're in Hot Water” and a film entitled “Burn Alert” concluded the program.

At the 11th annual meeting (March 15-17, 1979), Andrew McGuire, the second recipient of the prevention award, presented “A Way to Prevent One-third of the Fire Deaths in America.” He discussed the results of a 2-year investigation concerning the self-extinguishing cigarette. Other papers presented at the 11th annual meeting included “Recognition and Treatment of Inflicted Burns in Children,” and additional information from “Project Burn Prevention” was presented by Elizabeth McLoughlin, the fourth prevention award recipient. Finally, two afternoons were allocated for the continuous showing of 8 films covering the subject of prevention.

Conspicuously absent in the 1980 program book were the papers to be presented at the burn prevention portion of the meeting. This seemed strange so I spoke with Dr Paul Silverstein, who was the prevention committee chairman at the time. He received complaints from several firefighters that they could not get prevention papers on the program because the papers did not comply with the scientific method. Because most of these men were not in academics, they felt they should have their own “program committee” to review their abstracts. This was done and then presented to the ABA program committee. The abstracts were not printed in the ABA program because the program committee had not reviewed the abstracts. As a result, Dr Silverstein printed a separate program (at his own expense) for the prevention session with exactly the same cover as the main program.

At the next interim meeting of the board, Dr Silverstein was “raked over the coals for daring to produce my own prevention program and using the logo on the cover without their permission” (personal communication, January 2000). That was when he informed them that the logo had never been copyrighted and that anyone could use it. (As a matter of fact, several burn units had copied the logo on arm patches for their lab coats.)

At the 13th annual meeting in 1981 (April 2-4), there was a burst of prevention activity, which I am sure was spurred by the previous aggressive prevention chairman, Dr Paul Silverstein, who was the recipient of the 1992 burn prevention award, and the prevention chairman in 1981, Dr Thomas Wachtel. This meeting probably represents the most time devoted to prevention issues of any previous or future meetings. A correlative session exclusively devoted to prevention papers was included. Topics included were state fire and burn injury control guidelines, education, cigarettes, burns in the elderly, marketing an outreach program, increasing public awareness by means of the media (public service announcements), and recidivism in burns. The poster session had its first prevention poster, titled “ABE: Area Burn Education Program.” Other topics that were presented included flammability standards, use of the media and prevention, combined metropolitan council for fire, and burn prevention.
At the 14th annual meeting in 1982 (May 13-15), there were two correlative sessions that dealt with prevention; both were in a panel format. The first was “Tap Water Scalds” and the other was titled “Fire-Safe Cigarette Campaign.” In 1982 the Journal of Burn Care & Rehabilitation published the first Burn Prevention Materials and Resource list. The Journal of Burn Care & Rehabilitation introduced the Burn Prevention Forum. At that time 67% of households had a smoke detector.

At the 15th annual meeting in 1983, the Special Interest Groups first appeared, and among them was prevention.

At the 19th annual meeting in 1987, the first Burn Prevention Award was given to Matt Maley. In 1987 the ABA officially supported National Burn Awareness Week. Also in 1987 the US Fire Administration/Federal Emergency Management Agency conducted a workshop to reexamine America’s fire problem. It was titled “America Burning Revisited.” The conclusions regarding prevention were (1) public awareness of fire prevention is still not perceived as a high priority and (2) there is a lack of information needed to analyze the fire problem and evaluate programs. The latter is still true today.

During the end of the 1980s and the beginning of the 1990s, there was a steady growth in prevention activities at the annual ABA meetings.

At the 28th annual meeting in 1996, the Everett Idris Evans Memorial Lecture was given by Dr Manohar Keswani from New Delhi, India. The title was “The Cost of Burns and the Relevance of Prevention.” Keswani emphasized that a long-term in-depth prevention education program reduced burn incidence.

Recently, the director of the Federal Emergency Management Agency appointed a Blue Ribbon Committee to review the US Fire Administration because of questions by fire service leaders about the direction of the organization. No representative from the “burn team” was on the panel. One of the recommendations was to revisit “America Burning,” now to be called “America Burning Recommissioned.”

The recommendations relating to prevention included more funding for research and development for advanced technologies for fire prevention and protection and burn care and rehabilitation.

So much for the past. I will now take a short detour to briefly explain modern injury science to provide a better understanding of burn prevention and treatment. Since 1985, the age-adjusted death rate for burns and fires has decreased by 33%. In the United States in 1995, the leading causes of injury-related deaths in their order of magnitude were motor vehicles, firearms, poisoning, falls, suffocation, drowning, and lastly fires and burns. For people who were younger than 15 years, burns ranked third. In 1996 there were 1.9 million fires reported in the United States, 25,550 injuries, and 4585 deaths, and the total cost of fires was estimated to be a staggering $9.4 billion dollars.

The word accident has long been used in descriptions of burns. Accident implies a chance, misfortune, or lack of predictability. A burn isn’t an act of God, an unavoidable random event, or caused by bad luck or fate. A burn represents physical damage that occurs as a result of an exposure to a physical or chemical agent at rates greater than what the body can tolerate. A burn is an injury, not an accident. Although the exact moment of the event may not be predictable, it generally results from combinations of adverse environmental conditions, inappropriate use of equipment or a product, abnormal behavior, or personal risk factors.

Public health is defined as the effort organized by society to protect, promote, and restore the people’s health. Burns represent a substantial public health issue in this country. The United States has the distinction of having the highest incidence of burns of any industrialized country in the world.

Modern injury control underscores the concept that any injury results from exposure to a specific agent or hazard and affects specific high-risk groups more than others. The 3 risk factors associated with injury prevention are (1) the vector or energy source and the way it is delivered, (2) the host or injured person, and (3) the environment (both physical and social). In 1968 Haddon identified 3 phases of an injury event. (1) The pre-event phase includes methods to prevent the agent from reaching the host and thus to prevent the injury event. (2) The event phase includes strategies that can be effective at the time to either prevent or minimize the host’s injury. (3) The post-event phase includes strategies to either limit or repair the damage. By applying Haddon’s matrix to a burn injury, we can analyze the event and determine prevention strategies.

There are both passive and active prevention strategies. Passive strategies are automatic and require no individual action to be protective. These are the most effective. An obvious nonburn example is mandatory installation of air bags in motor vehicles; examples for burns are mandatory smoke alarms in all new houses and apartments and factory pre-set thermostats on hot water heaters. Active strategies are voluntary. They require repetitive individual action to be protec-
tive. These are the least effective and the most difficult to accomplish. Examples are encouraging the homeowner to lower the thermostat on the hot water heater or to practice fire drills. Although it is difficult, but not impossible, to change host behavior, it is nearly impossible to do so over a long period. People forget or are noncompliant. Innocent bystanders, particularly children, may sustain a burn injury because of careless behavior by an adult. We have all too often seen the victim of the “gasoline to burn trash” scenario. Common sense is not so common.

A prevention program requires systematic gathering of epidemiologic data. Unless the prevalence of the problem is known, important aspects of morbidity and mortality rates may not be appropriately evaluated. The steps to develop a specific burn prevention program are the following: (1) identify and prioritize the target problem, (2) determine the specific circumstances of the burn, (3) identify all possible preventive measures, (4) prioritize interventions on the basis of problem size and likelihood of success, (5) implement interventions, and (6) evaluate the effects of interventions.

The 4 Es of intervention are engineering, economic, enforcement, and education. Engineering is usually passive. Examples relating to burns include building codes, such as fire escapes and types of flame-resistant building materials. Economic includes insurance premium reduction for homes and businesses equipped with smoke detectors or sprinkler systems. Enforcement means influencing behavior by laws and regulations. An example is building inspections of new structures to assure fire safety code compliance. Unfortunately, enforcement of regulations is often problematic. Penalties such as fines or even jail are potential deterrents, but are they effective? Education is aimed at influencing behavior through reasoning and knowledge.

In 1954 Dr Carl Moyer, who with Dr William Monofò introduced 0.5% silver nitrate, published an article titled “The Treatment of Severe Thermal Injury.” He wrote, “The real solution lies not in the treatment of burns, but in the prevention; not in therapeutic but in sociologic medicine. We are not going to stop using fires, warming our houses, cooking our food, bathing in warm water.” Moyer realized that behavioral modification might not be an effective burn prevention strategy.

Everyone working with burn victims intuitively knows that one of the best prevention strategies is behavior modification through education. Or is it? Project Burn Prevention was a program funded by the Consumer Products Safety Commission (CPSC) in 1975. It was undertaken to determine if a burn prevention program would decrease burn deaths with the use of an educational program and media messages that involved a large population base. McLoughlin et al concluded that there was no reduction of burn incidence or severity in their study with the school education program or media campaign. Education for personal responsibility is not sufficient. Passive prevention measures such as product recall and redesign and legislation appear to be the best preventive strategies.

Over the last 32 years, the membership of the ABA has targeted 5 areas of burn prevention. Unfortunately, success has been elusive. I will briefly discuss each area.

**FLAMMABLE CLOTHING**

The attention of the medical community and public to the flammability of clothing suddenly began in the mid-1940s because children wearing Gene Autry-type cowboy suits or chaps were getting severe leg burns. The chaps were covered with a shaggy material made of highly flammable brushed rayon. As a result, the Flammable Fabrics Act was passed in 1953. The act was to regulate the manufacture or sale of highly flammable clothing. An analysis of 6000 patients with burns admitted to 15 burn centers between 1965 and 1969 (NBIE data) showed that 86% of all flame burns involved fabrics. Crikclair et al contributed much to the cause of promoting an awareness of the hazard of clothing flammability in the early 1960s and 1970s. Crikclair not only conducted extensive research in fabric flammability but was also a strong advocate for flame retardant sleepwear legislation.

Next followed the saga of the flame-retardant chemical tris-(hydroxymethyl)-aminomethane (TRIS). The burn community hailed the introduction of children’s sleepwear treated with TRIS. Many articles appeared that attributed a reduction in clothing burns to the chemical, but most of those articles lacked hard scientific data. In 1977 the CPSC banned the sale of children’s clothing containing the chemical TRIS, not because of the lack of scientific proof of its effectiveness but because a “2-year feeding study” conducted by the National Cancer Institute showed that TRIS caused cancer in test animals.

In early 1993 the CPSC revisited the issue of children’s sleepwear for a variety of reasons, including decreased sales of traditional sleepwear, consumer preference for other fibers, limited consumer sleep-
wear choices, and less expensive imported garments. One would suspect that clothing manufacturers and importers might have had some input in the CPSC actions. In an article by Cusick et al., the reason for choosing age younger than 9 months was that infants younger than 6 months are insufficiently mobile to expose themselves to sources of fire. In 1996 the CPSC exempted sleepwear standards for infant garments sized 9 months and under and for tight-fitting garments in larger sizes from the Flammability Standards for Children’s Sleepwear. The ABA, in conjunction with the Safe Children’s Sleepwear Coalition and other organizations, opposed the CPSC ruling but to no avail. In 1999 the commission said it did not find sufficient data to support claims of additional injuries from relaxed standards. The standards were amended to require permanent labeling of the risks of exempted clothing and required point of purchase hang tags to increase consumer awareness of burn risks. This action highlights the importance of epidemiologic data.

HOT WATER BURNS

The solution is simple. Or is it? Yes, tap water scald burns are preventable, but are spill and immersion burns? I don’t mean to downplay tap water, but the incidence of tap water scald burns is very small compared with spill burns. One has to look no further than the state of Washington. In 1983 state legislation required that all new home water heaters be preset at 49°C (120°F). This was coupled with an education program to have people voluntarily decrease water heater temperatures. Follow-up in 1988 showed that there had been a reduction in hot water–related pediatric burn injuries. However, was it solely related to these two factors? A simple but effective prevention tool is the liquid-crystal thermometer, which is a plastic card with a liquid-crystal strip.

Unfortunately, voluntary reduction of heater thermostat settings to safe levels has not been successful everywhere. In 1980 the CPSC refused to mandate a maximum water heater temperature of less than 54°C (130°F). Negotiations with heater manufacturers resulted in the voluntary decrease of preset temperature to 54°C in gas heaters and to 60°C (140°F) in electric heaters. Both temperatures are still high enough to cause serious burns in a short time. Active prevention programs to modify behavior have not proven to be successful. The instructing of individuals in how to decrease water heater temperature to a safe level or behavior modification through education is one thing, but long-term compliance is difficult.

Mandatory regulations to preset thermostats would be the most effect passive strategy, but support by manufacturers is lukewarm. Once again the burn community must provide data if a change is to occur. But take heart, even if the burn community isn’t successful in altering the behavior of people, others are standing in the wings eager to promote the cause. Of course, I speak of the often slandered and maligned legal profession. We must give credit where credit is due. This is no better exemplified than when successful litigation forced McDonald’s to print “Caution: Contents Hot!” on all styrofoam coffee cups. McDonald’s must protect the consumer if he or she wants to put a cup of hot coffee in their lap.

FIRE-SAFE CIGARETTES

The ABA must publically condemn smoking. However, everyone knows people will continue to smoke. In 1993 30% to 45% of residential fire–related deaths were caused by the careless use of cigarettes. Of 191,729 residential fires, smoking was reported to be the cause in 4.8%, which resulted in 10.6% of the burn injuries, 17% of the deaths, and 4.1% of $2.16 billion lost in all residential fires. Even worse, in apartments, cigarettes accounted for 7.2% of all fires, 26% of the injuries, and 27% of the deaths. Fires that began in bedding were attributed to cigarettes 44% of the time, and fires associated with upholstered furniture were caused by cigarettes 63% of the time. A lit cigarette may continue to burn for as long as 20 to 45 minutes without being smoked.

On March 14, 1979, the Board of Directors of the ABA unanimously endorsed a national campaign calling on the manufacturers to produce a fire-safe cigarette. Within 10 months, the first legislation was introduced in both houses of Congress, and not surprisingly, it failed. In 1984 the Cigarette Safety Act created a technical study group to determine if it was technically and commercially feasible to develop a fire-safe cigarette. A report to the US Congress in 1987 stated that this could indeed be done by reducing the cigarette circumference, lowering the tobacco density, making the paper less porous, and reducing the citrate in the paper.

Andrew McGuire has been one of the strongest advocates for a fire-safe cigarette. Two important facts emerge: (1) burn data on nonfatal cigarette fire–related injuries are lacking on the national level and (2) legal liability may very well turn out to be the most effective means of decreasing both nonfatal and fatal injuries associated with cigarettes. Legal liability against tobacco manufacturers for possible collusion
to discourage the development of fire-safe cigarettes has been reported. I recommend everyone read the article titled "How the Tobacco Industry Continues to Keep the Home Fires Burning" by Andrew Mcguire. A Fire Safe Cigarette Act (HR 1130) was passed by the Senate in March 1999. It directed the CPSC to promulgate fire safety standards for cigarettes. It directed that no later than 18 months after the date of the enactment of the Act, the CPSC had to issue a cigarette fire safety standard for cigarettes to reduce the risk of ignition presented by cigarettes. As of March 7, 1999, the Act was languishing in the Subcommittee on Telecommunications, Trade, and Consumer Protection. But there is good news! On January 11, 2000, Philip Morris announced that it had developed and will conduct consumer research on a safer cigarette made with new patented paper. The paper has extra bands of paper stripped through the product. It is designed to stop burning if the cigarette isn't puffed. Should the production of a safe-cigarette be voluntary or required by law? The latter would be the most expeditious and effective, but will it ever happen?

SMOKE DETECTORS

Without question, the use of smoke alarms has had the greatest impact in decreasing fire deaths in this country. In 1966, the percentage of residential fire-related deaths in homes with an operating smoke alarm was 13%; 11.5% of the residential fire-related deaths occurred in homes with a nonoperating alarm and 38.5% occurred in houses without an alarm. When fire deaths in apartments were evaluated, 29.5% occurred when alarms were present and working. Why was that? Perhaps hallway or apartment alarms sounded after the victims were overcome by smoke, there were fewer routes of escape, or there were multiple stories. This figure is very disturbing. Perhaps sprinklers are the other ingredient. There are two excellent prevention studies relating to the use of smoke alarms.

In 1985 McLoughlin et al published the article, "Smoke Detector Legislation: Its Effect on Owner-Occupied Homes." Their conclusion was that smoke detector installation in new houses appears to be effective when mandated by a building code. Mallonese et al published the article, "Surveillance and Prevention of Residential-Fire Injuries" in 1996. That study was conducted in Oklahoma City. A smoke alarm give-away program in an area with a high rate of residential fires was instituted. The study confirmed that a smoke alarm give-away program can reduce the incidence of injuries from residential fires. Of concern though is that at the last inspection performed, 48 months after the give-away program, 15% of the alarms had been removed from a house when the occupant had moved, 9% of the occupants no longer had the alarm, there were no batteries in 19% of the alarms, and in 7% of the homes, the alarm or battery was not functioning. Voluntary compliance can't be relied on. A law can be on the books, but a mechanism must be in place to verify compliance. In addition, local laws could make the seller or lessor legally responsible for assuring the presence of a smoke alarm at the time of transactions. The real estate and apartment associations should also accept this responsibility. This is a big undertaking. More than 3 million single and multiple dwellings are built each year, and what about existing homes and apartments?

FIRE SPRINKLERS

Sprinklers complement smoke detectors. They are the single most effective way of limiting the spread of fires in the early stages. The National Fire Protection Association reports that people with smoke alarms in their homes have a 50% better chance of surviving a fire. The addition of sprinklers and smoke alarms increases your chances of surviving a fire by more than 97%. One sprinkler was adequate to control fire in more than 90% of documented sprinkler activations in residential fires.

In 1978 San Clemente, California, was the first jurisdiction in the United States to require residential fire sprinklers in all new structures. In 1985 Scottsdale, Arizona, required a sprinkler system in every room of all new industrial, commercial, and residential buildings. The cost of a sprinkler system in a new 2000 sq ft home in 1986 was $1.14/sq ft; in 1996 it was $0.59 to $0.70/sq ft. Installation in an 1800 sq ft new house would be approximately 1.7% of the total cost.19

In 1996 residential sprinklers were found in less than 2% of homes in which fires were reported. Prevention efforts must be directed at the local community level to adopt building ordinances or codes that make installations in homes compulsory. Insurance premium reduction or tax credits could be incentives for sprinkler installation. In April 2000 the voters of Mesa, Arizona, a community near Scottsdale, defeated Proposition 300, which would have required automatic fire sprinklers in all new homes and occupancies; home builders and realtors were instrumental in defeat of the proposition.
Voters were concerned that mandatory inspections would lead to "sprinkler police." On May 15, 2000, the Mesa City Council did approve a measure that requires home builders to offer residential sprinklers to home buyers.40b

The word future is a frequent addition to the title of many speeches. It hopefully lures the listener to believe the orator has identified, and will supply, a solution to the selected topic. The value of any prediction depends on the "shrewdness" of the forecasters' understanding of the chosen topic.

WHAT THEN IS THE FUTURE OF THE ABA AND BURN PREVENTION?

First, we must continue to collect data. The success of a burn prevention strategy is in the availability of reliable burn statistics, including mortality rates and, more importantly, morbidity rates. Before we can design, develop, implement, and evaluate a strategy, there must be identification, and analysis of the problem. The ongoing collection of data permits the following: (1) identification of the magnitude of any type of injury, (2) monitoring of trends and specific areas of burn injuries, (3) identification if new injury problems arise, and (4) a way to evaluate burn prevention or intervention efforts.

The cooperative effort between the American College of Surgeons and the ABA to develop and implement the National TRACS®/ABA burn software data registry program has not progressed smoothly or rapidly enough. The program was to be available in the spring of 2000. When the software functions as planned, the ABA will then have to determine if the burn units using the program should help defray the yearly cost to store and retrieve data. Has the time for charity ended? Will this be accepted by the software users?

Second, burn prevention research must be of the highest quality. Most programs have been local in scope and, most importantly, have had very little impact on the overall incidence and outcome of burn injuries. Reasons include the focusing on too many strategies at once, lack of sufficient subjects, no controls, too short or inadequate follow-up, no control for confounders, and most importantly, no relation of mortality and morbidity rates as outcome measures. Let's put science into prevention research.41

Class I studies are the gold standard. These are prospective, randomized, and double-blinded. Burn prevention requires a well-organized, planned, and coordinated effort that involves medical, political, community and, foremost, individual effort. Because the incidence of both burn deaths and total injuries is decreasing, no single burn unit or community will have a large enough population base to conduct meaningful prospective controlled studies. Peck and Maley42 determined the population requirements to conduct statistical prevention studies. A program necessary to reduce injuries by 50% and 10% (at level of .05 and power of 0.08) requires a population of 9330 and 295,082, respectively. A program that would result in a 50% and 10% reduction in burn deaths requires a population of 4,672,000 and 148,175,000, respectively. Note fewer subjects are necessary when the reduction of incidence is highest.

Third, the ABA should sponsor or organize cooperative prevention studies at the local, state, and national levels. Am I naive in thinking this can be done? Is cooperation between burn units possible? Are there so many people with self-serving agendas that cooperation is impossible? Are we only to give burn prevention lip service? Several examples of cooperative research include the following: (1) the Shriners Burn Hospitals and multiple clinic sites resulted in important information about pediatric outcome measurements43 and (2) the National Institute on Disability and Rehabilitation Research funds joint cooperation between 4 burn units. Community integration, functional ability, and psychological changes are but a few areas being investigated.

Why can't the same be done for prevention? One mechanism available within the ABA to help coordinate prevention projects is the use of the regionalization committee. Local issues are often different from national agendas. The ABA board, in conjunction with the prevention committee, should explore the feasibility of convening a burn prevention workshop to formulate future strategies and research that would bring together interested representatives from the private-sector, foundations, business community, state and federal agencies, national firefighter organizations, and others interested in burn prevention. This has been attempted before but not by the ABA.

Fourth, because the resources of our organization are limited we must use them wisely. The ABA can't provide large sums of money for all the activities it would like to support. The $150,000 the organization received as a result of negotiating the change of this years' meeting date, although it is painful to some members and exhibitors, will by the direction of the board of trustees be the initial corpus for a newly formed tax-exempt burn foundation. Hopefully members of the ABA will take the lead in contributing to the foundation. For the foundation to grow
and support the four missions of the ABA, members must seek additional funds from all possible sources, including industry, private sources, and foundations.

Fifth, how do we foster prevention research? It is time for more physicians to get involved. We must encourage and foster the younger members of the burn team to conduct prevention research. Everyone is in favor of prevention and everyone knows it is an important issue. However, does prevention research appeal to the young physician? How does prevention research look on a curriculum vitae? Will it advance anyone academically? The answer is yes, but only if it represents good science. Put science in burn research! Unless the leaders, both past and present, set the example, we can’t expect younger members to put forth much effort.

Sixth, members of the ABA must make a greater effort to form a stronger alliance with the fire community. Fire and burn safety issues can be approached both locally and nationally. Scattered pockets of excellent cooperation between burn units and fire departments do exist but not nearly enough to bring about significant burn prevention. It is astounding that in the United States it is unusual for a fire department to spend more than 5% of its budget on fire prevention. In many communities, fire prevention education remains the stepchild of the fire service.

Our prevention goals are the same.

How can the ABA help? The ABA should coordinate and sponsor a meeting with the key officers of the firefighter unions and seek the advice of firefighter members. We need to think beyond special interest groups or breakfast sessions. Firefighter courses are conducted yearly in conjunction with the annual meeting. However, what is the impact when these sessions are attended by so few firemen? The ABA should promote and encourage its members to speak at national meetings of firefighter organizations. In addition, the program committee should periodically conduct a plenary session at the annual meeting dedicated solely to the firefighter-burn community relationship. Think of the number of firefighters that would attend the annual meeting if each burn unit sponsored a local firefighter. The ABA’s association with the International Firefighter’s Union has been very successful. However, have we cultivated a relationship with the International Association of Fire Chiefs, which is composed of volunteer firemen? Firefighter fund raising efforts are important, but so is their partnership with the burn community to promote and conduct joint burn prevention programs. We must cultivate and develop a closer relationship. The ABA should actively recruit firefighter members.

Let’s bring them in the organization. At the present time, there are only 28 members (1.5% of the membership) who are firefighters. They are the key to community burn prevention. The following is an example of how this might work.

Dr Keswani quoted Wordsworth by saying, “The child is the father of the man.” We live in the age of the computer and the Internet. Those are two marvelous tools to educate the most vulnerable members of society about burn prevention. I am referring to the children, not to adults. However, it’s not so simple. In 1998, although 94% of US households had a telephone, only 42% had a computer and 26% used the Internet. It is no surprise that those with low income, those who are poorly educated, and minorities are on the lowest rung of the internet accessibility ladder. The population most often burned is the least likely to benefit from the computer. But this is changing rapidly, and our schools are the salvation. This is where ABA members can promote effective prevention programs. Firefighters are ideally suited to interact with children in their station area. They are well respected community role models. Stambaugh and Schaezman said that “...fire prevention education remains the stepchild of the fire service in many communities.” Is this statement any less true today than in 1988?

In conclusion, when we are dealing with prevention, resources are scarce and can be expensive. How do you decide if a burn event is important? It must be frequent, be severe, and affect a sufficient number of people, and there must be a reasonable chance of success at intervention. Don’t expect results in a short time (ie, decreasing smoking took many years because the problem had been around a long time).

“It is frequently said,” observed G. Henry Mundt in 1928 as he anticipated the prevention of many diseases, “medicine is the only profession which is deliberately committing suicide.” I don’t think there is any possibility that this will happen in the foreseeable future in burns. As Forest Gump repeatedly said, “Stupid is as stupid does.”

REFERENCES


