



National Center for Injury Prevention and Control



HELPING AMERICANS LEAD SAFER LIVES

Injury in America. It's endemic. It's accepted. Motor vehicle crashes, homicides, debilitating falls and concussions are so common that people believe they're inevitable.

They aren't. In 1992, the Centers for Disease Control and Prevention (CDC) established the National Center for Injury Prevention and Control to study the reasons that injuries occur and help state and local health departments and community groups put together programs to prevent them. CDC's injury research and programs protect Americans from harm.

Scientific Method Defines Prevention Strategies

CDC employs the same scientific methods to address injury prevention and control as it uses to prevent infectious disease by defining the health problem, identifying risk and protective factors, and developing and testing prevention strategies. CDC works to ensure that proven techniques move from testing to widespread adoption — so that Americans at greatest risk of injury will be safer from harm. CDC's injury research shows what works to keep people safe.

Network of Research Centers

Connecting research to the community has been one of CDC's primary focuses. Through a network of more than 20 research centers based at colleges and universities across America, the CDC and its partners are building a dynamic research infrastructure. These research centers work to identify critical gaps in knowledge of injury risks and protection, conduct important research to address these gaps and offer their findings to community public health workers to shape into effective programs to help each of us.

INJURY STATISTICS

- Injury is the leading killer of Americans in the first four decades of life;
- In 2002, violent and unintentional injuries caused more than 160,000 deaths;
- These injuries cost an estimated \$405 billion in lifetime medical costs and lost productivity; and
- Hospital emergency departments treat an average of 55.6 people for injuries every minute.

Seven Focus Areas

CDC's Injury Center works to prevent unintentional and violence-related injuries and to minimize the consequences of injuries when they do occur. Its public health approach draws on such sciences as epidemiology and other biomedical sciences, biomechanics and other engineering sciences, social sciences and economics in seven topic areas:

- Acute injury care, disability and rehabilitation;
- Preventing injuries at home and in the community;
- Preventing injuries in sports, recreation and exercise;
- Preventing transportation injuries;
- Preventing intimate partner violence, sexual violence and child maltreatment;
- Preventing suicidal behavior; and
- Preventing youth violence.

Where There's Smoke . . . There May Be Cyanide!

- Cyanide poisoning is an important but often underappreciated result of smoke inhalation.
- Exposure to hydrogen cyanide in fire smoke is the most common cause of acute cyanide poisoning that an Emergency Medicine professional is likely to encounter.
- Hydrogen cyanide is produced by the incomplete combustion of both natural fibers (such as wool and silk) and synthetic polymers (such as polyurethane, polyacrylonitrile, nylon and melamine) widely used in building materials and home furnishings.
- Synthetic polymers are increasingly used in very large quantities in residential and commercial buildings as well as vehicles such as cars and airplanes. Many contain nitrogen or halogen, resulting in the release of hydrogen cyanide and inorganic acids in fire smoke. In an enclosed-space fire, toxic levels of cyanide are known to contribute to death.
- Studies have shown that cyanide may play a significant role in causing death in some smoke inhalation victims.

Cyanide . . . A Deadly Combination With Carbon Monoxide

- Both carbon monoxide and cyanide in smoke act as chemical asphyxiates. A synergistic effect occurs when both are present, resulting in increased mortality.
- Toxic effects of hydrogen cyanide are most evident in the brain and heart, producing nausea, headache, dizziness, disorientation, tachycardia, arrhythmia, hypertension, seizure and cardiopulmonary arrest.
- Exposure to sublethal concentrations of hydrogen cyanide gas from smoke inhalation can result in:
 - incapacitation of a person trying to escape, resulting in greater likelihood of burn injuries
 - reduced speed of escape with prolonged exposure to toxic gases
 - disorientation—resulting in their choosing a longer escape path

Each of the above can limit the ability to escape, to survive and to continue in good health after the fire.

Smoke Inhalation—A Threat At Home

- Up to 10,000 deaths occur annually in the United States from smoke inhalation—ranking the U.S. as having one of the highest fire-death rates in the industrialized world.
- Most fire deaths (75%) are not due to burns but are due to toxic gas effects and oxygen deprivation, loosely known as smoke inhalation. The mortality rate following smoke inhalation is currently estimated to be 45% to 78%.
- At least 80% of all fire deaths occur in a residence. Fire deaths in homes outnumber fire deaths in all other buildings by 20 to 1.



- One third of fatal fires start with upholstered furniture, mattresses or bedding—all of which are highly likely to contain synthetic materials that release hydrogen cyanide when they degrade.
- Senior citizens age 65 and over and children under the age of 5 have the greatest risk of fire death. The fire death risk among seniors over age 65 is more than double; over age 75 triple; and over age 85 is 3.5 times the average population.



Could Cyanide Poisoning From Smoke Inhalation Be Treatable?

- Current U.S. treatment protocols for smoke inhalation don't specifically address cyanide due to the safety issues with the currently available cyanide poisoning antidote.
- In some European countries, large doses of hydroxocobalamin have been used successfully to treat smoke inhalation victims for cyanide exposure.
- In these countries, prehospital emergency care providers are able to treat smoke inhalation-associated cyanide poisoning on an empiric basis.
- Hydroxocobalamin is currently in development for potential use in the United States.

What Saves Lives Now?

- A working smoke alarm dramatically increases a person's chance of surviving a fire. Also, residential sprinklers have become more cost effective for homes, but few homes are currently protected by them.
- Home fire escape routes should be planned and practiced. Plan for two exits from every room. All family members should be taught to leave the house immediately and meet at a predetermined point across the street and to never reenter a burning building!
- Children should be taught to stay low as they evacuate and to feel closed doors before opening them. If the door is hot, the child should use another route. If the door is not hot, the child can crawl out of the room.

For more information please contact us at www.emdpharmaceuticals.com or 1-888-EMD-4LIFE

Much of the information in this fact sheet is based upon:

1. US Fire Administration, "Facts on Fire," updated December 15, 2003.
2. Sublethal Effects of Smoke on Survival and Health, Gann, Richard G. et al., National Institute of Standards and Technology.
3. Herndon, David N, Ed., Total Burn Care, Second Edition, London, England; Saunders, 2002.
4. Koschel, Mary Jo, Where There's Smoke, There May Be Cyanide, AJN, August, 2002, Vol.102, No. 8



HAND HYGIENE

CLEANING AND DECONTAMINATING HANDS IN THE PREHOSPITAL SETTING

Proper hand hygiene in healthcare is the single most important means for prevention of infection transmission. For decades, improving compliance with hand hygiene practices has been a challenge for infection control professionals whether in the hospital or in the prehospital setting.

The availability and use of alcohol-based hand sanitizing products as recommended by the Centers for Disease Control and Prevention (CDC), *Guideline for Hand Hygiene in Health-Care Settings* has stimulated interest in improving hand hygiene practices in health care settings. The guideline recommends the use of alcohol-based rub-in handwashes (gels, rinses, and foams) for routine hand decontamination in most clinical situations.¹

Researchers report that alcohol-based hand rubs are not appropriate for use when hands are visibly dirty or contaminated with proteinaceous materials.^{1,2,3} In these situations, it is recommended that hands should be washed with plain soap and water or antimicrobial soap and water. Based on these guidelines, EMS and first responder personnel are at a disadvantage since handwashing facilities are usually not available when hands become contaminated with organic matter or visible soil.

A CALL TO ACTION

To remedy this situation, Sani-Dex ALC Antimicrobial Alcohol Gel Wipes were developed to provide both the ability to clean hands if contaminated with organic matter or visible soil; and to kill 99.99% of germs that may cause cross-contamination and infection transmission. Sani-Dex ALC provides the mechanical friction to physically remove soil and bacteria from hands, an important function that rub-in alcohol handwashes cannot accomplish. Gels, foams, and rinses kill germs, but leave debris and soil behind.

The technique used for applying alcohol-based hand products also contributes to the efficacy of the product. Frequently, the user of alcohol-based handrubs applies an inadequate volume of product to the hands, thus not covering all surfaces and repeated applications may be necessary to ensure efficacy. A study conducted with trained infection



control professionals resulted in 63% of the participants had detectable bacteria after hand antiseptis.⁴ However, users of alcohol gel hand wipes have a greater tendency to reach those frequently missed areas. Sani-Dex ALC Antimicrobial Alcohol Gel Hand Wipes are presaturated with the sufficient volume of alcohol to cover all areas of hands and using the wiping motion enhances proper technique.

PDI, Professional Disposables International, is dedicated to developing infection control products for the many situations encountered in the prehospital setting. Sani-Dex ALC is our latest contribution to the advancement in hand hygiene. To learn more, visit www.pdipi.com or call 800-999-6423.

Notes:

¹ Boyce JM, Pittet D. Guideline for hand hygiene in healthcare-settings: recommendations of the Healthcare Infection Control Practices Advisory Committee and the HIPAC/SHEA/APIC/IDSA Hand Hygiene task Force. *MMWR* 2002; 51 (RR16):1-

² McDonald LC. Hand hygiene in the new millennium: drawing the distinction between efficacy and effectiveness. *Infect Control Hosp Epidemiol* 2003; 24:157-59.

³ Larson EL, APIC Guidelines Committee. APIC guideline for handwashing and hand antiseptis in health care settings. *Am J Infect Control* 1995; 23:251-69.

⁴ Widmer AF, Dangel, M. Alcohol-based handrub: evaluation of technique and microbiological efficacy with international infection control professionals. *Infect Control Hosp Epidemiol* 2004; 25:207-209.

Proper Hand Sanitizing Technique

When Using A Sani-Dex[®] Antimicrobial Hand Wipe

Cleanse your hands:

- Before and after using gloves
- When hands are visibly soiled
- After any contact with patient skin
- After contact with body fluids or excretions
- When you go from a contaminated body site to another body site during patient care
- After coming in contact with anything in the immediate vicinity of a patient
- Before caring for patients with a form of severe immune suppression



Pull wipe up and tear to one side at perforation. Close lid tightly.



Wipe fingertips and nails individually.



Wipe between all fingers of both hands.



Wipe both thumbs.



Wipe palms of both hands thoroughly.



Wipe backs of hands.



Wipe both wrists and forearms.



Discard wipe in appropriate container.

IMPORTANT NOTE: Be sure to use every portion of the wipe.



PDI The Professionals' Choice for Infection Control

Professional Disposables International
The Healthcare Division of Nice-Pak Products, Inc.
An ISO 9001:2000 Certified Company

Wet wipes are the best choice for infection control.

You... Before Pain



No Time to Lose
Get Back to Life

The Impact of Pain

Pain is a very common, even disabling condition. More than one third of all medications prescribed in emergency departments are for pain relief—that's more than 60 million pain prescriptions.

- A study published in the *Journal of the American Medical Association* estimates that pain costs employers more than \$60 billion annually in lost productivity.
- Overall, decreased performance at work due to pain results in four times the number of lost productive hours than absenteeism.
- Pain is also one of the most common reasons people seek emergency care.

Results of a recent survey sponsored by American College of Emergency Physicians and Ortho-McNeil Pharmaceutical, Inc. further demonstrate how pain and pain treatment side effects, such as nausea, constipation and excessive sleepiness can disrupt people's daily lives. The results illustrate the impact of some pain treatments which while effective, can impair your ability to participate in daily activities.

What patients are saying...

- One in 5 people experienced side effects that sidelined them from daily routines
- One in 4 discontinued acute pain medication as prescribed due to side effects including nausea, constipation, excessive sleepiness and inability to function

What doctors are saying...

- Nearly 50% of their patients rarely initiate dialogue regarding their concerns about side effects
- 60% indicate it is very important that an acute pain medication they prescribe have few side effects, allowing patients to continue their daily routines

All medicines have potential side effects, including allergic reactions. Talk to your physician if you experience unwanted side effects. Your physician may discuss managing these side effects or may decide to change your medication.

For more information about managing your pain, contact the American College of Emergency Physicians.



At some point in your life you may experience acute pain.

Whether a result of injury, sprains, strains, surgery, muscle or joint flare-ups, pain can be a distraction or even disabling. Pain and certain pain treatments can keep you from work, play, family needs—from your daily life—an issue when you have responsibilities and obligations you can't ignore. Fortunately, today there are many options for managing pain.

If you experience pain, it is essential to work with your healthcare professional to choose a treatment option that is right for your lifestyle, allowing you to focus on what's important in your life and put YOU...Before Pain!

Managing your Pain

Without medication

- **Application of cold**—For pain resulting from an injury, application of a cold pack is most effective in the first 24 hours. Ice the injured area for 20 minutes of each hour as needed for comfort. Use a cold compress; do not put ice directly on the skin.
- **Physical therapy**—If you have suffered an injury or undergone surgery, your doctor may recommend physical therapy to increase functionality, control pain and speed recovery.
- **Exercise**—Consult your doctor to get help in developing an exercise program that is right for you.
- **Relaxation therapy**—Stress affects the body by resulting in tightened muscles, which worsens pain, and increased heart rate and blood pressure. The following methods may help relax your mind and body to help reduce your pain:
 - Focus on pleasant images
 - Listen to relaxing music
 - Begin a relaxation exercise program (e.g., yoga)

With medication

- **Many types of medication are available for treating pain.***

The medications can be prescribed along with other forms of therapy to best treat your pain. Your physician will determine the treatment that is right for your medical condition and lifestyle.

Frequently, pain can be successfully treated with commonly used pain relievers such as acetaminophen or nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen.

For more severe pain, your doctor may prescribe a combination opioid analgesic along with acetaminophen and NSAIDs. Common opioids are codeine, tramadol, hydrocodone, oxycodone and morphine.



* Some people may experience unpleasant side effects from certain pain medications such as nausea, vomiting, constipation, headaches, dizziness, diarrhea, stomach upset/ulcers/bleeding, impaired liver/kidney function, respiratory depression and/or physical or psychological dependency. Some medications can cause you to be groggy and unable to return to daily activities right away. Talk to your physician about side effects and how to obtain relief.

Tips for Remaining Active

Getting the best results

- **Good communication with your physician or nurse is key**

- Explain how much pain you are experiencing.
- Use a scale to describe your level of pain
- Keep a diary of pain frequency and severity to help your doctor understand your specific pain relief needs
- Find both at www.acep.org; look for the "You...Before Pain" logo

- Develop a pain management plan.
- Set goals
- Make a commitment to pain treatment
- Talk to your physician about your lifestyle and activity level. Discuss possible unpleasant side effects of recommended medications and how they may impact your lifestyle.
- Ask about a complete pain management plan before having surgery or other potentially painful procedures.
- Take over-the-counter pain relievers as directed on the label and prescription pain medications as prescribed. Misuse of these medications greatly increases the risk of side effects.

Remaining functional through your pain at home and at work

- **Know your body's limitations**—Avoid situations that can potentially increase your pain such as:
 - Lifting of heavy objects
 - Twisting, bending forward and reaching
 - Sitting/standing in one position for long periods of time
- **Rely on family, friends, and support groups** (sponsored by local hospitals, pain organizations)—Your treatment program can be enhanced by emotional support, which can effectively reduce anxiety.
- **Stay informed**—Educate yourself about your specific type of pain and the latest treatments available and their side effects.
- **Rest when necessary**—Get plenty of sleep.

A Primer on Emergency Care

The first few minutes after an injury or medical crisis occurs are frequently the most important.

The American College of Emergency Physicians has identified the following warning signs of a medical emergency:

- Difficulty breathing, shortness of breath
- Chest or upper abdominal pain or pressure
- Fainting, sudden dizziness, weakness
- Changes in vision
- Confusion or changes in mental status
- Any sudden or severe pain
- Uncontrolled bleeding
- Severe or persistent vomiting or diarrhea
- Coughing or vomiting blood
- Suicidal or homicidal feelings

Review this list with your physician and ask whether there are other warning signs you should watch for, because other factors, such as previous medical problems, may be important. In addition, ask when you should call the doctor's office vs. go straight to an emergency department or call an ambulance. Find out what you should do when the doctor's office is closed.



WHEN TO CALL 911

Always call EMS if the victim needs immediate medical treatment. To make this decision, ask yourself the following questions:

- Is the victim's condition life-threatening?
- Could the victim's condition worsen and become life-threatening on the way to the hospital?
- Does the victim require the skills or equipment of paramedics or emergency medical technicians?
- Could the distance or traffic conditions cause a delay in getting the victim to the hospital?

If your answer to any of these questions is "yes," or if you are unsure, it is best to call EMS.

Paramedics and emergency medical technicians can begin medical treatments at the scene and on the way to the hospital and alert the emergency department of your condition en route.

When you call for help, speak calmly and clearly. Give your name, address and phone number; give the location of the victim; and describe the problem. Don't hang up until the dispatcher tells you to, because he or she may need more information or need to give you instructions.

CHOOSING AN EMERGENCY DEPARTMENT

If you or a member of your family has a potentially life-threatening emergency, call EMS and the ambulance will take you to the nearest emergency department capable of treating the condition. For conditions that are not life-threatening, you may have several nearby emergency departments from which to choose. Your choice (which you should plan before you need emergency care) should be based on several factors:

- **Doctor's recommendation.** Your physician may recommend an emergency department based on his or her staff privileges, knowledge of the staff or familiarity with its capabilities.
- **Staffing.** It used to be common for emergency departments to be staffed by physicians without any specialized training. Today, emergency departments are staffed by specialists, many of whom are board-certified in

emergency medicine or who are full-time, career emergency physicians. In any case, emergency departments are staffed 24 hours a day, 7 days a week. Other specialties, such as cardiologists, orthopedic surgeons and pediatricians, should be on call in case they are needed. Specialty back-up varies from hospital to hospital.

- **Pediatric capabilities.** If you have children, make sure the emergency

department you choose has the right size and type of equipment for pediatric needs. If the physicians and nurses are not emergency specialists, find out what kinds of pediatric emergency training they have. Also make sure the hospital has pediatricians on call.

- **Options listed by your health plan.** Check the provisions of your health plan regarding emergency care coverage.

For more information or materials from the American College of Emergency Physicians, go to www.acep.org or call (800) 320-0610, ext. 3006