

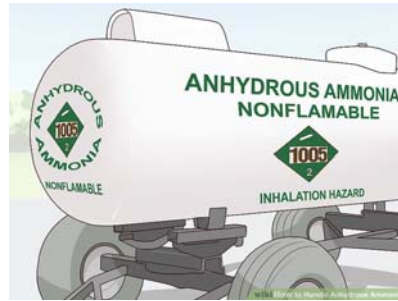
# Dane County EMS

Monthly Newsletter

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## BURN CARE

As outdoor clean-up projects and fall bonfires wrap up, we are all acutely aware of the dangers of open flames and the potential for thermal burns. This month, we would like to remind everyone that not all burns are caused by hot surfaces and fires; chemical burns can be a significant source of morbidity and mortality. And while we commonly think of things like Hydrofluoric acid and white phosphorus which cause dramatic burns, there are many commonly encountered materials in everyday life that can cause serious injury if we as responders don't regard them with the appropriate amount of respect. This memo will focus on some of the commonly encountered chemicals that can cause burns, and how to manage the initial treatment.

**Anhydrous ammonia** – used extensively in fertilizers and the manufacture of synthetic fibers (not to mention methamphetamine!), anhydrous ammonia exposure can result in significant alkali burns. Injuries to the eyes and lungs are common. Symptoms are related to the concentration of the hydroxyl ions; severe contact burns result in black, leathery skin while the less severe burns are gray-yellow. Topical and mucosal exposures are treated with copious amounts of irrigation with water, as the anhydrous ammonia is highly water soluble. Irrigation should be repeated every 6 hours for the first 24 hours, and evaluation by a Burn Surgeon is advised. Eye injuries should be anesthetized with topical medications to overcome the blepharospasm and achieve adequate irrigation. Inhalation injuries are extremely dangerous and may cause laryngospasm, pulmonary edema, glottic edema and bronchiectasis. Patients with evidence of severe facial or pharyngeal burns should be intubated early; there is no specific treatment for inhalation injury caused by anhydrous ammonia.

## BURN CARE - CONTINUED

**Cement burns** – Wet cement is a poorly recognized and under reported cause of alkali burns. Cement has an initial pH of 10-12 that rises to as high as 14 as the cement sets. Presenting symptoms generally occur several hours after exposure and include burning sensation, erythema, pain and blister formation. The full extent of the burns are not evident until 12-48 hours after exposure.

Treatment consists of removal of contaminated clothing and copious water irrigation.

**Automobile air bag burns** – airbag deployment may cause both thermal and chemical burns in exposed patients. Airbags occasionally perforate and release sodium azide or sodium hydroxide, which cause alkali chemical burns. Underappreciating the potential for an alkali chemical burn can have serious consequences, so it is important to always note if the airbags were perforated when assessing the vehicle damage. Treatment is copious irrigation with water. Eye exposures may require the hospital to perform swabbing of the cornea to look for embedded particles.

**Hydrocarbons** – these chemicals are used in nearly every aspect of daily life, from kitchen cleaning products to chemical solvents and automobile products – most notably gasoline. Contact with hydrocarbons causes cell membrane injury and dissolution of lipids, which causes skin necrosis with prolonged exposure. Once the skin has been damaged, the hydrocarbons are easily absorbed systemically, and can cause severe pulmonary, neurologic, renal, cardiovascular and GI injuries. Treatment consists of removal from the scene, discarding clothing that may hold chemicals against the skin and thorough decontamination with copious water.

**Tar and asphalt** – for construction use, both are heated to high temperatures for both roofing and paving applications. This results in both a thermal burn and a chemical burn, as tar is made from bituminous coal and asphalt is made from crude petroleum. Treatment after exposure consists of accelerating the cooling process by immediately irrigating with cold water. The tar and asphalt require a solvent to help remove them from the skin, such as Neosporin, sunflower oil, olive oil, butter and baby oil.

There are a great many things to keep in mind when responding to the scene of an emergency, and many of the everyday items encountered can fade into the background when caring for patients. Please remember to be vigilant about chemical burns, and while being mindful of patient modesty always remember to remove ALL of the contaminated clothing.

If you have any additional questions, please do not hesitate to contact me at [mtlohmei@medicine.wisc.edu](mailto:mtlohmei@medicine.wisc.edu), or the Dane County EMS Office at [dcems@countyofdane.com](mailto:dcems@countyofdane.com)

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