Perilous Products Popular With Hunters and Hobbyists

*With hunting season approaching first responders and ED personnel need to be aware that some of the most lethal exposures can happen before the hunters even head out to the woods and fields.

*As fall approaches many hunters are busy cleaning their guns and then protecting them from rust. This can now be done at home with a process called cold bluing.

*First the gun is cleaned and then possibly degreased. The solutions which are used for cleaning firearms generally contain detergents, ammonias, petroleum distillates and pine oils. Some solutions sold for degreasing the gun contain methanol. The gun cleaning products containing petroleum distillates and naphtha are classified as hydrocarbons. While serious aspiration symptoms can occur after exposures to hydrocarbons, in general patients with a hydrocarbon exposure will improve with good supportive care.

*The solutions used to degrease the gun may contain methanol. As little as 4 ml of 95% methanol may cause blindness and 15 mL can be fatal if untreated. In addition to containing methanol some cleaner/degreasers also contain isopropyl alcohol. An immediate call to the Missouri Poison Center can help guide you through the treatment of a patient who has had an exposure to one of these products.

*In the past gun owners would often take their guns to a professional and have the gun protected from rust with a process called “hot bluing”. This is a complicated process and rarely done at home. However, with the increase in bluing products that do not use heat and availability of instructional web sites and “blogs” gun owners are more likely to attempt this process at home.

*Compounds used in the bluing process that give the gun a blue-black appearance and protect the gun from surface oxidation contain selenium dioxide, phosphoric acid, and copper sulfate, all of which are strong corrosive acids. Products containing selenious and phosphoric acid may be fatal if ingested.

*These products come in both a liquid and a cream form. There is also a pen which resembles a Sharpie® marker that contains selenious acid.

*Popular product names include Birchwood Casey which is a liquid and Brownells which is a cream with a light yellow appearance. Most of the companies that make the cold bluing liquid also sell other products under the same name which are used for cleaning and degreasing.

*The ingredients in the bluing product may be listed as selenious acid or as selenium dioxide.

*Both the pen and the cream could be tempting to a curious child. The liquid is easier to be swallowed and therefore more likely to cause a fatality.

*While rare, pediatric exposures to gun bluing products that contain selenious acid have been reported as fatal when ingested. A case from the Kentucky Regional Poison Center was reviewed in Vet Hum Toxicology from April 2000.

A healthy 22-mo-old male ingested up to 15 ml of Gun Blue solution (selenious acid). Initially he was pink, alert, and combative in the ambulance but his condition rapidly deteriorated. There was no measurable blood pressure, his oxygen saturation was 84% by pulse oximetry, and his mental status deteriorated to require bag mask ventilation. The child was cyanotic, unresponsive, and without palpable pulses upon presentation. Cardiopulmonary resuscitation was initiated unsuccessfully and was terminated after 35 minutes.
There have been other cases of fatalities involving adults with intentional ingestions. Hunsaker reports a case in the Journal of Forensic Science from 2005 in which investigators recovered a bottle of gun bluing agent by the bedside of a 24 yr old man. He exhibited signs of acute selenium intoxication and presented with nausea and vomiting, rapidly followed by pulmonary edema and cardiovascular collapse approximately 3-4 hours after ingestion. Even in adults very small amounts of these products may cause fatalities.

These exposures are true medical emergencies. Ingestion of a few drops of a selenium acid-containing gun bluing solution may cause illness, and 15 mL has been fatal.

*There are additional treatments that your emergency department physicians may have reviewed including the use of ascorbic acid or vitamin C in treating a selenium exposure. This type of treatment was reviewed in K.R. Olsen’s 5th edition of Poisoning and Drug Overdose. It indicated that in vitro experiments showed selenium salts could be reduced to elemental selenium and therefore not absorbed as well. The Missouri Poison Center, however, does not recommend this treatment (as also referenced in POISINDEX® System: Klasco RK (Ed): POISINDEX® System. Thomson Reuters, Greenwood Village, Colorado (Vol 153 expires [09/2012]). Poisindex) because although in animal studies the ascorbic acid does increase the excretion of selenium it also increases the selenium toxicity. There is no role for chelation in this exposure. Please consult the Missouri Poison Center for all exposures to gun bluing agents.

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**WHAT TO DO**

If you are presented with a patient who has had an exposure to a gun bluing agent follow these steps:

- Have a staff member place an immediate call to the Missouri Poison Center while emergency personnel secure the patient’s airway. Difficulty breathing after a corrosive ingestion correlates with a high risk for significant GI injury for the patient.

- Attempts to administer activated charcoal may put the patient at risk for aspiration. Never induce vomiting.

- The selenious acid in the gun bluing is usually 1 to 4%. Do not be fooled by these low numbers. This is a highly toxic acid.

- **There is no antidote.** Because the selenious acid can be fatal it may be appropriate to consider the insertion of a small flexible NG tube, and with the guidance of the poison center toxicologist carefully suction the gastric contents. This is a hard decision as the risk of further injury to the esophagus must be weighed against the benefit of removing the acid. If the decision is made to use the soft NG tube the procedure must be performed almost immediately after the exposure. Concentrated acids will quickly soften the connective tissues and epithelium by dehydrating the cells and increase the chance of a perforation.

- Do not forget that if the patient has had a skin and/or eye exposure in addition to an ingestion thorough rinsing must be performed. The skin can be decontaminated with water and the eyes rinsed with a 0.9 % NS solution.

- On a less toxic note if your ED personnel is contacted regarding an exposure to any of the liquid gun-dog training scents such as dove, deer, duck, grouse, partridge, pheasant, quail and rabbit scent these are usually 40% dipropylene glycol which has a low order of toxicity in an acute ingestion. It is estimated that a lethal dose for an adult is greater than a pint or 473 mL. Unfortunately, there is little or no data on clinical toxicity to estimate the minimum amount necessary to cause toxic effects. An eye exposure to dipropylene glycol has been shown to cause minor corneal irritation. Dermal exposure can also cause a minor irritation. In most cases thorough irrigation of skin and eyes will resolve symptoms.

As the hunting season approaches, we as health professionals can take the opportunity to educate friends, family and the public about the toxicity of the gun cleaning and bluing products. Preventing an exposure to these products can be lifesaving.
Take Aim at Poison Prevention

There are many products used to keep firearms in good shape. Gun bluing protects a gun from rust and corrosion, but it may be fatal to a small child who might mistake this liquid for a soft drink. Gun bluing contains a variety of acids and other chemicals which can cause serious burns if the label instructions are not followed about wearing protective gloves. The chemicals are very toxic and rapidly absorbed if it is accidentally splashed or swallowed. Death can occur even in an adult. Do not waste minutes searching the Internet for answers. If it is accidentally splashed or swallowed, immediately call your poison center at 1-800-222-1222 for specific instructions. Store bluing and other rust and corrosion prevention chemicals in a locked cabinet and out of a child’s reach.

Keep children away from gun powder solvents and gun lubricants. These products contain alcohols and petroleum distillates. There is a risk of getting the petroleum products in the lungs which can cause pneumonia if the child chokes on the chemical. Another danger is gun powder and gun powder pellets which contain nitrates and other toxic chemicals. Remember that children are curious by nature and that these products are toxic and dangerous if they get in little hands and are swallowed. Store gun powder solvents, gun lubricants, gun powder and pellets in a locked cabinet and out of a child’s reach. Remember also to secure the gun itself with a trigger lock or store it in a locked cabinet.

Let’s not forget the invisible killer, carbon monoxide, which is a major cause for hunter’s deaths each year. Hunters who camp and use heating devices in enclosed spaces or who go back to their vehicles to warm up and accidentally fall asleep with their motors running are at risk for carbon monoxide poisoning.

To prevent carbon monoxide deaths:
• Don’t burn heaters in tents or unventilated spaces.
• Don’t warm hands and feet at the vehicle’s exhaust pipe.
• Remember that fresh air is the best treatment for carbon monoxide.

The use of insect repellent helps prevent bug bites and reduces exposure to viruses transmitted by mosquitoes such as the West Nile Virus. Use insect repellants when going outdoors, whether or not you can see mosquitoes. Most mosquitoes bite between dusk and dawn, but they may bite at anytime of the day or night. DEET is the active ingredient in many insect repellant products. It is one of the most effective insect repellants available to prevent mosquito and tick bites. The concentration of DEET in products varies from less than 10% up to 90%.

Use the following safety tips when applying insect repellent:
• Follow the directions on the repellent label.
• Apply insect repellent on exposed skin and clothing when you go outdoors.
• Do not apply repellent on skin under clothing.
• Do not apply on cuts, wounds or irritated skin.
• Do not apply to the hands of young children, or near the mouth or the eyes.
• Do not spray directly on the face.
• Do not allow young children to apply the repellent.
• Do not over-apply the product.
• Do not spray in enclosed areas or near food.
• Wash treated skin after returning indoors.
• The American Academy of Pediatrics does not recommend using DEET on children under 2 months of age.

Just in case you need us……
• Program your cell phone
• Download the Poison Help App
• Don’t waste time searching the Internet, just call 1-800-222-1222.

The call is free

What would you do if someone you know accidentally swallowed something dangerous? Anytime something that might be dangerous is swallowed, gets on the skin, or in the eye - call for help right away. Whether you have a poisoning emergency or just a question, don’t guess---be sure: Call your local poison center at 1-800-222-1222. A nurse or pharmacist will answer your call right away and give you the help you need.
Specialists in Poison Information
Rachel Andrews, RN, SPI; Anne Marie Bailey, RN, CSPI; Maureen Bredenkoetter, RN, CSPI; Jenny Burt, RN, CSPI; Linda Campfield, RN, CSPI; Jackie Coffey, RN, CSPI; Jan Cocayne, RN, CSPI; Sue Dougan, RN, CSPI; Barbara Eichhorn, RN, CSPI; Shelly Enders, PharmD, CSPI; Darlene Green, RN, CSPI; Kathy Hahn, BS Pharm, CSPI; Sandra Heffner, RN, CSPI; Peggy Huebner, RN, CSPI; Peggy Kinamore, RN, CSPI; Joanne Menendez, RN, CSPI; Julie Moore, RN, CSPI; Sue Nielsen, RN, CSPI; Carolyn Odom, RN, CSPI; Amanda Ruback, RN, CSPI; Joy Thompson, RN, CSPI; Rosanna Tochtrop, RN, CSPI; Dianne Wagner, RN, CSPI; Julie Weber, BS Pharm, CSPI; Wilkinson, Connie, RN, SPI; Janelle Williams, RN, CSPI; Jennifer Williams, PharmD, SPI
*CSPI denotes Certified Specialist in Poison Information

Managing Director
Julie A. Weber, BS Pharm, CSPI

Medical Director
Anthony J. Scalzo, MD

Assistant Medical Director
Rebecca Tominack, MD

Public Education Coordinator
Peggy Kinamore, RN, BSN, CSPI

Administrative Assistant
LaJohnna White

PoisonAlert Editors
Anthony J. Scalzo, MD
Julie A. Weber, BS Pharm, CSPI

PoisonAlert Contributors
Anne Marie Bailey, RN, CSPI
Jenny Burt, RN, CSPI
Shelly Enders, PharmD, CSPI
Peggy Kinamore, RN, CSPI
Carolyn Odom, RN, CSPI

Publisher
LaJohnna White

Please send comments and suggestions for future articles to:
Editors, PoisonAlert
7980 Clayton Road, Suite 200
Saint Louis, MO 63117

Or send e-mail to LaJohnna_White@ssmhc.com

The Missouri Poison Center website can be found at:

Public Education Materials
Missouri Poison Center is offering a variety of educational materials FREE of charge including magnets, stickers, and brochures. For a small fee, you can order the Toxic Plants Brochure for your garden club, the Bites and Stings Brochure for your scout troop, or the Poison Look-Alikes Brochure for your child care providers and parents. Please help us teach about poison prevention and spread the word that the Missouri Poison Center is open 24/7 and the call is free and confidential.