Science Bulletin

Volume 4 | Number 2 Article 8

10-1931

First Aid in the Laboratory

O. B. Read
Iowa State Teachers College

FIRST AID IN THE LABORATORY

From the nature of the work carried on in the laboratory one can not always control the results obtained. Accidents are liable to occur at any time. They may arise from many causes among which are incorrect reading of experiments by students, carelessness in obtaining material, defective apparatus, and poor manipulation. The kind of accidents occuring frequently are cuts by broken glass; burns caused by fires, acids, and alkalies; explosions; injuries by breathing poisonous gases; and fainting.

One of the best types of aid for accidents is prevention. Stress should be laid on the thoro reading and understanding of the experiment by the pupil before starting the work. All chemicals should be plainly labeled, any bottles without labels should be removed at once. Care should be used in preventing contamination of chemicals by returning them to the wrong bottle, and in the exchanging of stoppers. Broken pieces of glassware should be discarded at once, as the break is liable to continue and spill the contents on the experimenter or his companions. The shaping and handling of glass tubing is a point of importance. All bends should be uniform and gradual and the ends well firepolished. Care is necessary in the grasping of tubing in order to push it through stoppers so that it does not break at the bend and cut the hand and perchance leave pieces of glass in the wound.

All severe or deep cuts should be temporarily wrapped and then dressed by a physician in order to be sure there is no glass in them. A minor cut may be taken care of in the laboratory. In order to do this it is necessary to have on hand some antiseptic materials, bandages, and adhesive tape. Free bleeding of a cut is not undesirable as it has a tendency to carry away any poisonous material or germs that may have been on the flesh or on the pieces of glass. It is better not to wash the cut with water but to use antiseptic fluids to remove the blood and cleanse the flesh around it before applying the bandage. Do not put cotton on the wound as the fibers may get caught and become avenues of entrance for infection. Make sure there is no glass in the cut place before wrapping it up. A cloth or bandage should be placed next to the wound. Adhesive tape should not be used first as it will not allow for drainage and when removed it will more than likely tear open the cut. Any cuts in the face should be dressed by a physician in order to prevent scars.

Burns caused by taking hold of pieces of hot glass or ironware may be washed with a solution of sodium bicarbonate which will allay the pain and then should be covered with an antiseptic oil which also soothes the pain and keeps the flesh soft. Then it should be wrapped with a bandage in order to protect the place and keep out germs. The seared flesh makes a splendid place for the starting of infection.

Burns from hot water may be treated in much the same way as those by heated glass.

If the clothing catches fire the individual should lie down at once to protect the head and prevent the inhaling of the flames. A large heavy blanket, which ought to be kept in the laboratory for such emergency, should be thrown over the person to extinguish the flame. If no blanket is available coats and wraps will serve a good purpose. Also large quantities of water thrown on the clothing will extinguish the fire. If from one third to one half of the body surface is burned it is quite liable to prove fatal. The nervous shock is great and the person should be taken to a physician at once, or one called immediately. A good rule is never to allow bottles of inflammable liquids to be

brought to the desk where they may be spilled and catch fire from the lamps burning there.

Dilute acids or alkalies seldom do much injury unless they get on very delicate tissue such as in the eyes or mouth. Prompt and thoro washing with water is usually sufficient treatment. If concentrated sulfuric or nitric acid is spilled or splashed on the flesh, a copious application of water should be given to wash away the acid and dilute it. Following this, moistened sodium bicarbonate, ordinary baking soda, should be applied to neutralize the remaining acid. Avoid any severe rubbing of the injured part as the flesh is liable to be torn and give greater opportunity for infection to start. If acids are spilled on parts covered by clothing, abundant water should be applied quickly, the clothing removed immediately and carefully, it should never be torn off but cut off, and then the neutralizing material applied. After the acids are neutralized the adhering carbonate may be washed away, the affected parts dried and some ointments such as vaseline, sweetoil, or glycerine applied to keep it from drying up and feeling drawn so that it will remain soft and the scab formed may be pliable. It is wise to wrap the affected part with a bandage to prevent infection.

Burns from alkalies should be washed with abundant water and then neutralized with a weak acid such as vinegar or dilute acetic acid. Following this they may be wrapped up similar to acid burns.

Extreme care should be used in handling bromine that none should get on the flesh as it burns quickly and severely and is very difficult to heal. Temporary treatment is similar to that of acids. If much bromine gets on the body a physician should be consulted.

Poisonous gases are usually easily detected by their odor and escape from them is thus made possible. Hydrogen cyanide gas, prussic acid, has a slight and not unpleasant odor and is a deadly poison. One full inhalation is liable to prove fatal. There is no chemical antidote as it causes paralysis of the respiratory organs. The inhaling of chlorine from a weak solution may be helpful. When one is found affected with it allow plenty of fresh air and call a physician. Especial care should be used in the handling of cyanides used to kill bugs and butterflies. Never allow any acids to come in contact with them. Keep the containers tightly closed.

Hydrogen sulfide is very poisonous and if much is inhaled causes nausea and fainting. If too much is inhaled it may prove fatal. Fresh air and stimulants should be administered. The inhaling of ammonia fumes is helpful.

Chlorine gas is very irritating to the respiratory membranes. The breathing of ethyl alcohol placed on a handkerchief gives as much relief as anything. The breathing of dilute ammonia fumes is helpful. The apparent severe cold produced usually wears off in a few hours.

Any acids, alkalies, or salts getting into the eyes by explosions should be removed at once by washing with the proper counter irritant, being careful not to use too strong a solution so as to give added injury to the eyes.

If fainting should occur from any injury in the laboratory get the person to the open air, keep him lying down and apply a damp cloth to the face. If the person does not recover soon a physician should be called.

It is an excellent idea to have a first aid kit in the laboratory containing the following equipment plainly marked. A blanket for fires, varying concentrations of sodium bicarbonate solutions for acid burns, dilute acetic acid or vinegar for alkali burns, a dilute solution of ammonia, lime water, camphor solution, antiseptic solutions such as boric acid, dilute lysol or carbolic acid, mercuricrom, freshly prepared tincture of iodine, unguentine, vaseline, olive oil, and zinc oxide ointment. A package of absorbent cotton, a roll of adhesive tape, an assortment of bandages, and a pair of scissors.

Bauer and Black of Chicago publish an excellent little handbook on first aid. The Fisher Scientific Company publish a very convenient "Laboratory Emergency Chart."

O. B. Read