Emergency Care for Victims of

CHEMICAL ACCIDENTS

by Dr. Renaud Leroux

Emergencies involving dangerous substances are a daily occurrence in Canada. Many such emergencies are caused by fires that produce harmful chemicals such as carbon monoxide, hydrogen cyanide (used in the manufacture of armchairs), or hydrochloric acid (from products containing polyvinyl). And with more than 35,000 chemical products on the market, the potential for accidents is staggering. Other common emergencies involve transportation of dangerous goods, by truck and rail.

Less common, but full of disastrous potential, are earthquakes, landslides, or tornadoes that could break gas pipelines or tanks holding hazardous substances of all kinds.

As it is not always apparent if chemicals are involved, anyone arriving at the scene of an accident or a disaster, regardless of its nature, should behave as if hazardous substances were present until proof to the contrary. Unwary rescuers may risk serious injury, or death, and may delay rescue efforts.

Treating Casualties Different for Chemical Accidents

Emergency medical services are accustomed to treating casualties suffering from a wide variety of injuries, with each one requiring different treatment. This contrasts with a chemical accident, however, where the majority of victims will have varying degrees of the same injuries, needing a limited range of treatment. For example, victims of a chemical accident will usually have burns to the skin and eyes or respiratory problems because they have inhaled gaseous substances. Some products will be absorbed through the skin, mucous membranes and lungs, or sometimes they will be ingested. Exposure to certain chemicals can cause a condition known as methaemoglobinaemia that adversely affects the blood's ability to transfer oxygen. This condition can be treated successfully by administering the antidote, methylene blue. (See Table I for a list of selected chemicals and their corresponding antidotes.)

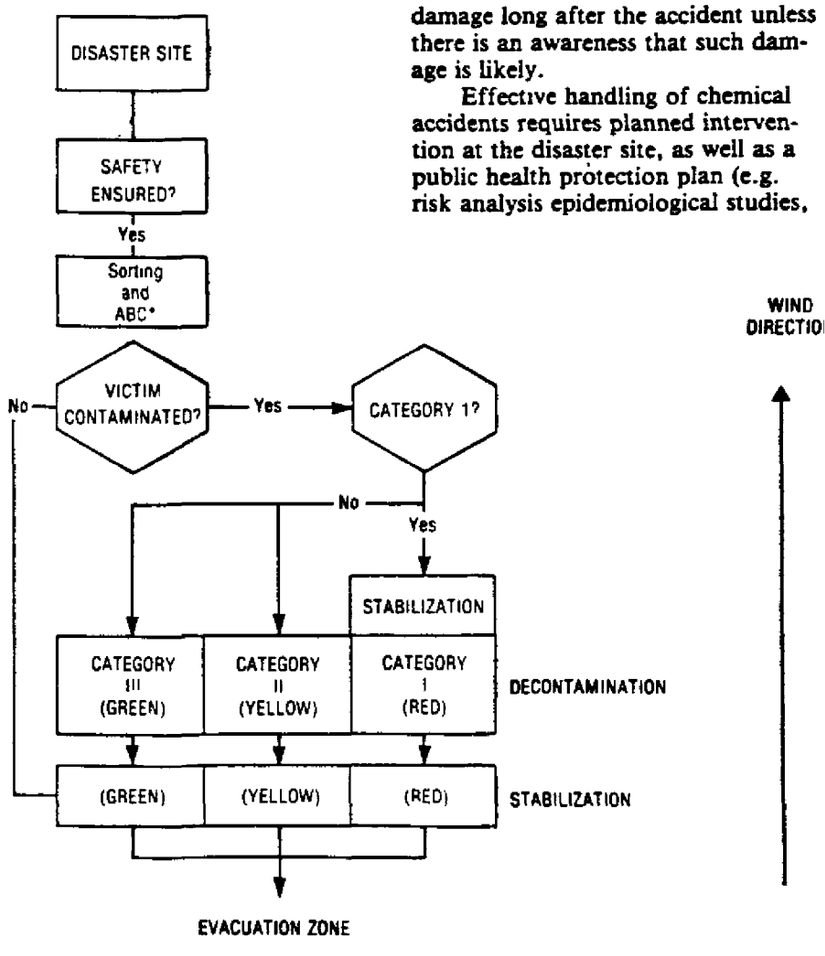
Often, because of inexperience, first-aid personnel and other first responders at the disaster site constitute the greatest number of victims.

Chemical accidents creating a great many victims such as the one at Bhopal, India, are, fortunately, rare. Usually the number of victims does not exceed 20. Nevertheless, chemical accidents are insidious and can cause damage long after the accident unless there is an awareness that such damage is likely.

Effective handling of chemical accidents requires planned intervention at the disaster site, as well as a public health protection plan (e.g. risk analysis epidemiological studies,

FIGURE 1

Emergency Medical Services Personnel Site Management for a Chemical Disaster



*Airways breathing and circulation