

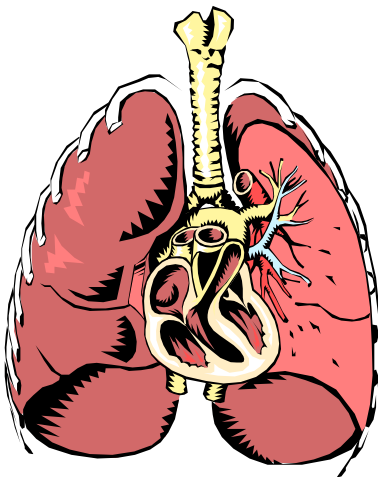


SMO 09-0401

TOXICITY ROUTE OF EXPOSURE - INHALATION

By SeaBright Insurance Loss Control

The degree of toxicity for a chemical is not only dependent on the dose-time relationship, but also on the route of exposure, i.e., the path by which the chemical enters the body. There are four principal routes of exposure. One is **injection** or puncturing through the skin. Another is **ingestion**, or passage through the walls of the gastro-intestinal tract. The last two are **absorption** through direct contact with the skin, and **inhalation** when the substance is inhaled and passed into the lungs.



In the industrial setting, inhalation is the easiest and most frequent route for toxic fumes, gases, and vapors to enter the body. The lungs have a very important job to do; that is, transfer oxygen from air to the blood and carbon dioxide from the blood to the air so that it can be exhaled from the lungs. The very thin membrane that surrounds the lung's air passages and air sacs (alveoli) are laced with small blood vessels. It is through this membrane that oxygen must pass from the lungs to the bloodstream, and through which carbon dioxide must pass from the bloodstream to the lungs where it is exhaled as a waste. This very thin membrane that allows oxygen and carbon dioxide to pass in and out is a very poor barrier against any toxic gases that may have been inhaled during the breathing process.

Once a toxic chemical is in the bloodstream, your circulatory system transfers it to all parts and organs in your body where it can have both a long term (chronic) and/or immediate (acute) effect on your health. One of the organs most affected by all chemicals is the liver. The liver is a vascular gland that secretes bile and causes metabolic changes to many substances in the blood, including toxic chemicals. It can convert a toxic chemical into compounds of greater toxicity, lesser toxicity, essentially the same toxicity, or it may not convert the chemical in any way at all. Chemical damage to the liver can be insidious.

All foreign chemicals that enter the bloodstream eventually exit the body as waste via the kidneys or the lungs, after being metabolized by the liver. The kidneys might be considered as the body's "sewage treatment plant" as they scavenge the blood and filter out dissolved solvents, excess biochemicals, foreign compounds, and other waste products resulting from the liver's metabolizing process. Similar to the liver, these chemicals can harm and even destroy the kidneys.

When your work exposes you to toxic fumes or gases, make sure that you are protected. Solutions include eliminating the hazard by changing chemicals or processes, engineering out the exposure through ventilation or isolation, or limiting exposure through job rotation. The last line of defense is wearing a respirator.

If respiratory protection is your solution, it is critical that all employees required to wear a respirator are medically cleared, receive proper training, and have been properly fit tested with the same make, model, style, and size of respirator that will be used. A written respiratory program needs to include all of these elements and provide for annual refresher training.



SAFETY MEETING AGENDA

DEPARTMENT/JOB SITE: _____ MEETING DATE: _____

1. **Open Meeting & Present safety topic:** _____
2. Read minutes from previous meeting.
3. **Persons present:**

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4. **Old Business** – Status of previous recommendations. Discuss pending old business if any.
5. **Accidents** – Discuss accidents and near misses that have occurred since the last meeting. Brief summary of accidents to date by number and type. Note any trends. Discuss corrective action taken, or needed. Concentrate on accident causes to make everyone more aware.
6. **Inspection Reports** – Report on findings and recommendations of any inspection reports made since last meeting.
7. **New Business** – Solicit employee suggestions. Discuss new procedures, changes to company safety policy, etc.

TIME MEETING STARTED: _____ TIME FINISHED: _____
MEETING CHAIRED BY: _____ TITLE: _____