

Carbon Tetrachloride Poisoning

Patient Education and Care Instruction Sheet

Overview of Carbon Tetrachloride

Carbon tetrachloride (CCl₄) is a manufactured chemical. It does not occur naturally, but it is present in the environment because it does not break down very easily and has built up over time from human activities.

CCl₄ is a clear liquid that evaporates into the air easily. It has a sweet odor that can be smelled at low levels. CCl₄ is most often found in the air as a colorless gas.

CCl₄ is not flammable and does not dissolve very easily in water.

CCl₄ was previously used

- In the production of refrigeration fluid and propellants for aerosol cans,
- As a pesticide,
- As a cleaning fluid and degreasing agent,
- In fire extinguishers, and
- In spot removers.

Due to the harmful health effects from exposure, consumer uses of CCl₄ were discontinued in the mid-1960s and pesticide uses were stopped in 1986. However, use of older products that might contain CCl₄ or use of household cleaning products containing bleach that might produce carbon tetrachloride have been reported since 1986. Only industrial and research uses remain in the United States.

How Can People Be Exposed to Carbon Tetrachloride?

Very low levels (called background levels) of CCl₄ can be found in

- Air,
 - Water, and
 - Soil.
-

Exposure to levels of CCl₄ higher than background levels is likely to occur

- At work in specific industrial locations where CCl₄ is still used or
- Near chemical waste sites where emissions into air, water, or soil are not properly controlled.

Some ways that CCl₄ can get into the body include

- Breathing CCl₄ present in the air,
- Drinking water or eating food contaminated with CCl₄,
- Getting CCl₄ liquid spilled on skin, or
- Getting CCl₄ contaminated soil or water on the skin.

**How Can
Carbon
Tetrachloride
Affect Health?**

Health effects from exposure to CCl₄ depend on

- How often,
- How long, and
- How much enters the body (exposure level or dose).

At lower exposures (lower doses), health effects might be

- Less serious,
- Less likely to be permanent, and
- Might go away more quickly.

At higher exposures (higher doses), health effects might be

- More serious,
- More likely to be permanent, and
- More likely last a longer period of time.

Higher exposures (amount getting into the body) to carbon tetrachloride can cause damage to the

- Liver,
 - Kidney, and
 - Nervous system, including the brain.
-

These effects can occur after

- Drinking, eating, or
- Breathing carbon tetrachloride, and
- Possibly from going through the skin.

The liver is especially sensitive to carbon tetrachloride exposure. In the liver, CCl₄ can cause cell damage or destruction. The kidneys can also be damaged, causing a build up of wastes in the blood. Severity of CNS effects depends on, among other things, exposure factors including exposure dose. People may feel intoxicated and experience

- Headaches,
- Dizziness,
- Sleepiness, and
- Nausea and vomiting.

These effects should go away if exposure is stopped, but higher exposure dose can lead to seizures, coma, and death.

If the exposure is brief and the dose is low, the liver and kidneys are able to repair the damaged cells and function normally again. Effects of carbon tetrachloride are more severe in those who drink alcohol regularly.

CCl₄ is regarded as highly toxic. It is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals.

How Can Carbon Tetrachloride Affect the Health of Children?

The health effects of carbon tetrachloride have not been well studied in children. But researchers believe the effects are likely to be similar to those seen in adults exposed to CCl₄.

How Can People Reduce their Risk of

The risk of CCl₄ poisoning from household or environmental exposures might be reduced by taking the

**Carbon
Tetrachloride
Poisoning?**

following steps.

- Check labels of imported consumer products for CCl₄.
- Use safer alternatives to products with CCl₄.
- If you must handle CCl₄, contact your health department or poison control center for instructions and only use respirators, gloves and other personal protective equipment recommended for use with CCl₄.
- Avoid alcohol if you have the potential for CCl₄ exposure.
- Discard any product you might have at home that contains carbon tetrachloride and that you might have used in the past.
- Store household chemicals in their original containers and out of the reach of children.
- Get well water tested if near an area contaminated with CCl₄.

Recommendations for workers to reduce possible CCl₄ exposure.

- Be sure to use recommended personal protective equipment (PPE) –appropriate gloves, eye and body protection, respirators, etc. – as required for the type of work you do with CCl₄.
 - Ask your employer for the safety data sheets (SDS) on all products that you use.
 - Be sure all containers are labeled for any chemical you use at work.
 - Ask your employer for training on how to use chemicals at work.
 - Your employer is required to provide labeling, Safety Data Sheets (SDSs) formerly called Material Safety Data Sheets (MSDS), and training as part of the OSHA Hazard Communication Standard. It is the law!
-

Is There a Test to Check if People Have Been Exposed to Carbon Tetrachloride?

While it is *technically* possible to measure CCl₄ in blood and exhaled air, these tests are not routinely recommended and are very rarely done due to practical and clinical limitations. Although these tests can show that a person has recently been exposed to CCl₄, the results cannot be used to predict reliably whether any adverse health effect might result.

Because carbon tetrachloride leaves the body fairly quickly, these methods are best suited to detecting exposures that have occurred within the last several days.

When to Call Your Doctor

Consult your physician if you develop any signs or symptoms of central nervous system or other health changes, especially those possibly related to heart, liver, and kidney.

Follow-up Instructions

Your doctor has checked the items below that require your attention.

Please make an appointment to:

- Have follow up laboratory testing
- Keep follow up doctor appointments
- See another specialist: _____
- Have other tests: _____

Other _____
