

Carbamazepine in Drinking Water

Carbamazepine is a contaminant that has been found in waters that could be used as drinking water sources in Minnesota. The Minnesota Department of Health (MDH) developed a health-based guidance value for carbamazepine in drinking water and, based on this value, does not expect levels in drinking water to harm Minnesotans.

What is carbamazepine?

Carbamazepine is widely used to help people with epilepsy control seizures. It is also used to treat bipolar and nerve disorders. Some common trade/brand names for carbamazepine are Tegretol®, Carbatrol®, and Equetro®.

How much carbamazepine is in Minnesota drinking water?

Carbamazepine has not been found in drinking water in Minnesota. However, there is limited study of levels in treated drinking water.

Has carbamazepine been found in other waters in Minnesota?

In 2010, the Minnesota Pollution Control Agency (MPCA) looked for a variety of pharmaceuticals, including carbamazepine, in surface water.¹ Treated wastewater and river water (up- and downstream from wastewater discharge points) was sampled at 20 locations. Carbamazepine was found in 96 percent of treated wastewater samples, 21 percent of upstream samples, and 79 percent of downstream samples. Concentrations in surface water were found up to 0.4 parts per billion (ppb). Concentrations in treated wastewater were found up to 1.5 ppb.

What is the MDH guidance value for carbamazepine in drinking water?

Based on available information, MDH developed a guidance value of 40 ppb for carbamazepine in drinking water.²

How can I safely use products containing carbamazepine?

As a prescription drug, carbamazepine has many health benefits for people taking it. Carefully read the prescribing information or package inserts for information about potential side effects, contraindications, and drug interactions when you pick up medicines from your pharmacy. Discuss any concerns with your doctor or pharmacist.

At a Glance

Carbamazepine is...

- a prescription medication used to control seizures.

Carbamazepine enters your body from...

- taking it as medication.

Your environmental impact can be reduced by....

- disposing of expired or unused medications properly.³

Carbamazepine in drinking water is safe if...

The level is lower than the MDH guidance value of 40 ppb.



Can carbamazepine in drinking water affect my health?

Carbamazepine has not been found in drinking water in Minnesota. The amount found in river water samples (0.4 ppb) is about 100 times lower than the MDH guidance value of 40 ppb. If you drink water containing up to 40 ppb carbamazepine for up to a lifetime there is little to no health risk.

How does carbamazepine get into the environment?

There are two main sources of carbamazepine to the environment. When a person takes carbamazepine, up to nine percent of it passes out of the body (unchanged) in urine.⁴ This carbamazepine is flushed down the toilet and mixes with wastewater. Another source in wastewater is excess or expired medication that gets washed down the sink or flushed in the toilet.

How long does carbamazepine stay in the environment?

Carbamazepine is generally persistent in the environment. Typical wastewater treatment methods remove only some of the carbamazepine. The remaining carbamazepine may be released to surface water and possibly reach drinking water. If carbamazepine is released to soil, some will remain in the soil and some will go into water. Carbamazepine does not collect in fish or in the food chain. This means that it will not get into your body from eating fish.

What are the potential environmental impacts of carbamazepine?

Currently, the potential ecological impacts of carbamazepine are not well understood.

The Contaminants of Emerging Concern (CEC) Program...

Evaluates health risks from contaminants in drinking water.

References

1. MPCA. Wastewater Treatment Plant Endocrine Disrupting Chemical Monitoring Study. February 2011.
<http://archive.leg.state.mn.us/docs/2011/mandated/110339.pdf>
2. www.health.state.mn.us/divs/eh/ri/sk/guidance/gw/carbamazepine.pdf
3. www.pca.state.mn.us/index.php/living-green/living-green-citizen/household-hazardous-waste/pharmaceutical-waste-disposing-of-unwanted-medications.html
4. FDA, 2009, Carbamazepine Fact Sheet from Novartis.
www.accessdata.fda.gov/drugsatfda_docs/label/2009/016608s101,018281s0481bl.pdf

More information on pharmaceuticals and personal care products in water is available from the US Environmental Protection Agency (EPA):
<http://water.epa.gov/scitech/swguidance/ppcp/index.cfm>.



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