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Updated

Nitrate in Drinking Water

Nitrate is a chemical found in most fertilizers, manure, and liquid waste discharged from septic tanks. Natural bacteria in soil can convert nitrogen into nitrate. Rain or irrigation water can carry nitrate down through the soil into groundwater. Your drinking water may contain nitrate if your well draws from this groundwater.

Nitrate is an acute contaminant. That means one exposure can affect a person’s health.

How does nitrate affect health?

It reduces the ability of red blood cells to carry oxygen. In most adults and children, these red blood cells rapidly return to normal. However, in infants it can take much longer for the blood cells to return to normal. Infants who drink water with high levels of nitrate (or eat foods made with nitrate-contaminated water) may develop a serious health condition due to the lack of oxygen. This condition is called methemoglobinemia or “blue baby syndrome.” Some scientists think diarrhea makes this problem worse.

Low levels of nitrate in water will not have a long-lasting effect on your baby. If your baby doesn’t have any of signs of blue baby syndrome, you do not need to have a doctor test for methemoglobinemia.

Does the state regulate nitrate in drinking water?

Yes. State law requires public water systems to sample for many contaminants, including nitrate, on a regular basis. Our drinking water quality standard for nitrate is 10 milligrams per liter (mg/L). Public water systems with nitrate levels over 10 mg/L must notify people who receive water from them.

What are the signs of blue baby syndrome?

Moderate to serious blue baby syndrome may cause brownish-blue skin tone due to lack of oxygen. This condition may be hard to detect in infants with dark skin. For infants with dark skin, look for a bluish color inside the nose and mouth, on the lips, or fingernail and toenail beds.

Mild to moderate blue baby syndrome may cause signs similar to a cold or other infection (fussy, tired, diarrhea or vomiting). While there is a blood test to see if an infant has blue baby syndrome, doctors may not think to do this test for babies with mild to moderate symptoms.

What should I do if my infant has blue baby syndrome?

Take a baby who has brownish-blue skin tone or a bluish color to the lips, tongue, gums, nail beds, or nose to a hospital immediately. A medication called “methylene blue” will quickly return the baby’s blood to normal.



HELPING TO ENSURE SAFE AND RELIABLE DRINKING WATER

Can I prevent blue baby syndrome?

Yes. Do not give infants younger than 12 months drinking water with nitrate levels above 10 mg/L. Do not offer high-nitrate vegetables such as beets, broccoli, carrots, cauliflower, green beans, spinach, and turnips until the baby is at least seven months old.

Nitrate levels in well water can vary throughout the year. If you have a private well and you're not sure about your water quality, you may want to use bottled water to prepare your baby's food and drinks. Although boiling water kills bacteria, it will not remove chemicals such as nitrate. In fact, boiling may actually increase the nitrate level.

Will breast-feeding give my infant blue baby syndrome?

Low levels of nitrate have been found in breast milk, but the levels are not high enough to cause blue baby syndrome.

Can nitrate affect adults?

Although red blood cells quickly return to normal, some health conditions can make people more susceptible to health problems from nitrate. Individuals with the following health conditions should not drink water with more than 10 mg/L of nitrate:

- Individuals who don't have enough stomach acids.
- Individuals with an inherited lack of the enzyme that converts affected red blood cells back to normal (methemoglobin reductase).
- Women who are pregnant or trying to become pregnant. Some studies have found an increased risk of spontaneous abortion or certain birth defects.

How can I tell if my well water has nitrate?

Shallow wells, poorly sealed or poorly constructed wells, and wells that draw from shallow aquifers are at greatest risk of nitrate contamination. Manure and septic tank waste may also contain disease-causing bacteria and viruses.

If you own a private well, we recommend that you test for coliform bacteria and nitrate every year. Your county health department can tell you where you can get your water tested and may have specific recommendations for testing. Many certified labs in Washington charge \$20 to \$40 per test. If your nitrate test results are 5 mg/L or higher, you may want to re-sample in six months.

Where can I get more information?

If you get your water from a public water system, call your water utility or the state Department of Health at 800-521-0323. You can also visit online at <http://www.doh.wa.gov/CommunityandEnvironment/DrinkingWater.aspx>

If you have a private well, call your local health department. You can also find information in *Private Wells: Information for owners* (331-349) a publication available in English and Spanish at <http://www.doh.wa.gov/portals/1/Documents/pubs/331-349.pdf>

For a list of certified labs, visit the state Department of Ecology online at <https://fortress.wa.gov/ecy/laboratorysearch/> You can search for labs by your city, county, or state. Click on the name of a lab to see the tests it performs. Call the lab to make sure it's accredited to analyze for nitrate in drinking water.

For people with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TDD/TTY call 711).