NITRATES, BLUE BABY SYNDROME, AND DRINKING WATER: A Factsheet for Families

PEHSU Pediatric Environmental Health Specialty Units

How to Keep Your Baby Safe from Nitrates in Drinking Water

Nitrates are chemicals that can get into drinking water from natural sources or from human activities. Drinking water with too many nitrates can cause serious health problems for babies.

In some locations, especially in agricultural areas, private wells are contaminated with nitrates. The amount of nitrates in public water supplies is usually at a safe level. Check with your public water supplier to make sure your public water is safe.

Nitrate-safe drinking water is:

- Water from public water supplies
- Well-water that has been tested at 10 ppm of nitrates or less
- Bottled water

Drinking or eating a lot of nitrates can stop red blood cells from doing their job of carrying oxygen. When red blood cells in babies less than 12 months old don't carry oxygen well, it can make the baby's skin look bluish or brownish ("Blue Baby Syndrome," also called methemoglobinemia), and make the baby sick. Contact your doctor immediately if you see these changes in your baby.

Tips to Prevent Exposure to Nitrates

You can take simple actions to prevent exposure to nitrates. Follow the suggestions in the boxes.

DO

- Use drinking water that is nitrate-safe.
- Continue breastfeeding your baby.
- Get your well-water tested for nitrates if you use a well for drinking water (see how on the next page).

DON'T

- Use contaminated water to make baby formula or baby food.
- Give your baby contaminated water to drink.
- Drink contaminated water if you are pregnant or trying to get pregnant.
- Give your baby vegetables until he or she is 6 months old.

How do nitrates get into drinking water?

Nitrates can occur naturally in water at low concentrations. Nitrates can also get into water from human activities like using fertilizers, raising livestock, or poor maintenance of septic systems.

How can my baby be exposed to nitrates?

Babies are exposed when they drink contaminated water, or when contaminated water is used to make infant formula or baby food. Bathing is safe because nitrates can't pass through baby's skin.

Nitrates can be in some vegetables, including spinach, beets, lettuce, cabbage, green beans, squash, carrots, and turnips. Avoid giving these foods until the baby is 6 months old, which is when experts recommend introducing solid foods.

How do nitrates harm babies?

Nitrates stop red blood cells from doing their job of carrying oxygen. When red blood cells can't carry oxygen throughout the body, then the baby's cells and organs cannot work properly.

What symptoms should I look for if my baby is exposed to nitrates?

Nitrates can turn a baby's skin brown or blue. You may see the color change inside the nose or mouth, on the lips, or under the fingernails and toenails. Your baby may become unusually fussy, tired, or have trouble breathing.

Is it safe to breastfeed my baby?

Yes. Adults break down nitrates in their body, so even if a mother drinks water contaminated with nitrates, her breast milk is safe for her baby.

Can nitrates harm a developing fetus?

There is weak evidence that nitrates may increase the risk of birth defects or miscarriage. Women who are thinking about getting pregnant, or who are pregnant, should avoid drinking water contaminated with nitrates.

Can nitrates harm adults or other children?

The bodies of adults and children older than 12 months can better break down nitrates, so they are less likely to be harmed. Some adults or older children with digestive or genetic medical problems may be sensitive to high levels of nitrates in drinking water.

Why is it important to test my well-water for nitrates?

Nitrates do not change the way the water looks, smells, or tastes, so you have to test the water. A well-owner is responsible for keeping his or her well-water safe to drink.

How do I test my well-water for nitrates and what do my test results mean?

Contact your local health department for help. They can find a certified laboratory to test your well and help you understand the results. Test your private well for nitrates before first use and at least once a year. Compare your well-water test result to the drinking water standard set by the United States Environmental Protection Agency (EPA). Your well-water is nitrate-safe if the nitrate level is 10 ppm or less (also written as 10 milligrams per liter (10 mg/L)).

What if I use public water? How can I check my supplier's Consumer Confidence Report (CCR)?

Public water suppliers mail a Consumer Confidence Report to customers every year (also online at http://cfpub.epa.gov/safewater/ccr/index.cfm). The CCR report includes information on nitrates.

Resources

- For acute poisoning, contact your state poison center at 1-800-222-1222.
- For clinical and public health assistance, contact your regional PEHSU office. To find your regional office, call 1-888-347-2632 or go to http://www.aoec.org/PEHSU.htm.

Disclaimer: PEHSU funding was made possible (in part) by the cooperative agreement award number UTI Grant Number U61 TS000118 from the Agency for Toxic Substances and Disease Registry (ATSDR). The views in this guidance do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.
Acknowledgement: The U.S. Environmental Protection Agency (EPA) supports the PEHSU by providing funds to ATSDR under Inter-Agency Agreement number DW-75-92301301-0. Neither EPA nor ATSDR endorse the purchase of any commercial products or services mentioned in PEHSU publications.

Authors: N. Beaudet, MS, CIH; A. Otter, DNP, ARNP; C. Karr, MD, PhD; A. Perkins, BA; S. Sathyanarayana, MD, MPH.
Plain language assistance by J. Rayman, MPH, ATSDR. Last updated July 2014.