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The following is an excerpt from the author's recently published e-book 'Toxic Metals and Antidotes', which can be accessed through:

<https://www.smashwords.com/books/view/156817>

Water metal analysis- an environmental test useful to locate the source of metal exposure

The water people drink influences their metal status. This is especially true during chelation and it is thus important to know about the metal content of water.

United States and European countries enforce strict standards that regulate the safety of drinking water supplies. While the World Health Organisation proposes similar (but usually more lenient) regulations for other nations, these are not necessarily followed. In rural areas of India, for instance, water supply systems are often inadequate or not available, and contaminated water remains a source of disease for millions of people.

Excessive levels of arsenic, lead or mercury in water cause skin ailments and cancers while young people experience severe developmental problems, all due to an overexposure of toxic metals. To make safe water available to all requires awareness and an enormous financial commitment. Governments have to enforce stricter pollution controls, and industry will have to abide. Both have to face high costs to change their individual environment, and changes are happening at a very slow pace. Health problems due to water contamination have not eased.

Drinking water quality varies from place to place, depending on the condition of the source water from which it is drawn and the treatment it receives. EPA, for instance, does not regulate private wells, but provide recommendations as seen in Table 1.

Every community water supplier must provide an annual report (sometimes called a consumer confidence report) to its customers. The report provides information on your local drinking water quality, including the water's source, the contaminants found in the water, and how consumers can get involved in protecting drinking water. These annual reports will by necessity be short documents, but more information is provided on request. Environmental agencies of European governments provide websites concerning water safety. The website for the German environmental agency (Umweltbundesamt) is www.umweltbundesamt.at/umweltinformation/wasser/

Information regarding the British water safety board can be found at: www.dwi.gov.uk/

The EPA website can be used as a starting search: www.epa.gov > Water > Ground Water & Drinking Water, the source of the following information about toxic metals in water. Please note that the British and German environmental agencies may recommend slightly varying (and often stricter) maximum contaminant levels (MCL).

Table 1:

| Contaminant | MCLG ¹ (mg/L) ² | MCL or TT ¹ (mg/L) ² | Potential Health Effects from Ingestion of Water | Sources of Contaminant in Drinking Water |
|----------------------------------|--|---|--|--|
| Antimony | 0.006 | 0.006 | Increase in blood cholesterol; decrease in blood sugar | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder |
| Arsenic | 0 ⁷ | 0.010 as of 01/23/06 | Skin damage or problems with circulatory systems, and may have increased risk of getting cancer | Erosion of natural deposits; runoff from orchards, runoff from glass & electronic production wastes |
| Barium | 2 | 2 | Increase in blood pressure | Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits |
| Beryllium | 0.004 | 0.004 | Intestinal lesions | Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries |
| Cadmium | 0.005 | 0.005 | Kidney damage | Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries, paints |
| Chromium (total) | 0.1 | 0.1 | Allergic dermatitis | Discharge from steel and pulp mills; erosion of natural deposits |
| Copper | 1.3 | TT ⁸ ; Action Level=1.3 | Short term exposure: Gastrointestinal distress Long term exposure: Liver or kidney damage Wilson's Disease Patients should consult their doctor if amount of copper in their | Corrosion of household plumbing systems; erosion of natural deposits |

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|--|--------|---|---|---|
| | | | water exceeds the action level | |
| Fluoride | 4.0 | 4.0 | Bone disease (pain and tenderness of the bones); Children may get mottled teeth | Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories |
| Lead | zero | TT ⁸ ; Action Level=0.015 | Infants and children: Delays in physical or mental development; Adults: Kidney problems; high blood pressure | Corrosion of household plumbing systems; erosion of natural deposits |
| Mercury (inorganic) | 0.002 | 0.002 | Kidney damage | Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands |
| Nitrate (measured as Nitrogen) | 10 | 10 | Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome. | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits |
| Nitrite (measured as Nitrogen) | 1 | 1 | Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome. | Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits |
| Selenium | 0.05 | 0.05 | Hair or fingernail loss; numbness in fingers or toes; circulatory problems | Discharge from petroleum refineries; erosion of natural deposits; discharge from mines |
| Thallium | 0.0005 | 0.002 | Hair loss; changes in blood; kidney, intestine, or liver problems | Leaching from ore-processing sites; discharge from electronics, glass, and drug factories |

Water collection for Metal Testing:

General Information:

The mineral and trace element content of water easily varies, and is greatly influenced by the environment, geographical location, water treatment and the pipes in which the water flows. The mineral and bacterial content of City water is less influenced by weather conditions such as prolonged heat or rain than the ground water found in wells and cisterns.

Checking your cistern or city water:

Turn on your kitchen faucet and let the water run for 10 minutes. After that time, you are drawing water deep from the well or from the city pipes. Open the plastic tube or bottle provided from the laboratory, rinse it three times and then fill. Do not fill totally to the top. Leave about one centimeter space unfilled.

Checking your water pipes

Old water pipes are a source of metals and bacteria. When water stands over several hours in the pipes, depending on its acidity or alkalinity, it may cause mild corrosion and free metals. Old solder can release toxic metals into your drinking water. Copper may be released from copper pipes. To see how your drinking water is affected, you must take the water sample first thing in the morning. Open the faucet and rinse the plastic tube or bottle three times, then fill as outlined above.

Hardness testing:

A mineral analysis is a prerequisite, necessary for the calculation of hardness.

Microbiological water testing is best performed by a local laboratory within driving range as bacteria grow during shipping. A bacteria-free water sample will remain bacteria free as long as no bacteria is introduced into the container, but if water contains small amounts of any type of bacteria, the bacteria concentration will increase during shipping, especially during hot weather. Chlorination of water eliminates bacteria growth.

For more information, contact ebb@microtrace.de or service@microtrace.de

About the author:

E.Blaurock-Busch is research and quality control director at Micro Trace Minerals Clinical Laboratory, Germany. She has authored several books and many articles in German and English. She is advisor to the International Board of Clinical Metal Toxicology www.ibcmt.com and the German Medical Association for Clinical Metal Toxicology <http://www.metallausleitung.de/>