

Vancouver's Water Woes

Parasites in tap water can make you sick

By Dr. Sid Weiss

One hundred years ago, the upper reaches of Vancouver's beautiful North Shore Mountains stood pristine, and untouched. Towering, majestic, old-growth forest touched the sky. Sparkling, cold lakes nestled amongst the forest. Those fortunate enough to call Vancouver their home enjoyed perhaps the purest water on the planet. Or did they? In fact, there has always been abundant wildlife in our local mountains, and that wildlife has always harbored parasites in their intestines. Today, more Vancouverites than ever before are drinking bottled or otherwise purified water. But is there really any cause for concern? What dark secrets could our water hold?

Judy Smith of the Greater Vancouver Regional District's water quality department says, "We would really like to know." She concedes that the common waterborne parasites *Cryptosporidium* and *Giardia* are regularly found in the weekly samples the GVRD supplies to the Provincial Centre for Disease Control. She also adds, "The test is so unreliable, there is no way of knowing if the organisms are viable or even capable of causing disease in humans."

One thing we do know is that there is more vomiting and diarrheal-type disease in Vancouver whenever the turbidity (cloudiness) of our water increases over the threshold of one NTU (nephelometric turbidity unit). A recent Health Canada study, which looked at the incidence of patients in Vancouver seeking medical help for these complaints between 1992 and 1998,

found that "a statistically significant relationship between turbidity occurrences and reports of vomiting and diarrhea to doctors and hospitals existed." This becomes even more significant when we consider that these types of symptoms are often not reported to a physician.

Any discussion about parasites in drinking water deserves some reference to the worst outbreak of waterborne disease to date in North America. In 1993, in Milwaukee, Wisconsin, more than 100 people died and 400,000 fell ill after drinking water contaminated with *Cryptosporidium*. The elderly, the very young, and those with impaired immunity were most affected. An accidental contamination had occurred upstream from the city's water source, and the water became noticeably cloudy. Although normal filtration and chlorine treatments were all in place, they were insufficient to deal with the severity of the contamination. The question naturally arises, "Could it happen here?" The quick answer is no. Our watersheds are protected and there are no agricultural or industrial polluters upstream. There is however, wildlife — deer, bears, perhaps a marmot or two, the occasional cougar, and lots of rodents — which, no doubt, are the source of those parasites the CDC continues to find in increasing numbers. One controversial issue is whether or not previous logging and road building in the watersheds may contribute to more rapid erosion resulting in increased sediment and organic material in the reservoirs, and thus increased turbidity. The theory that an undisturbed forest

cover will allow for a slow percolation of surface water down through deep layers of soil, creating a natural filtration process and leaving pure clean water, may not hold water here. Judy Smith states, "There is no ground storage [of water]. The rains fill the reservoirs directly or via small streams that dry up in summer." The GVRD water system is one of the largest in North America. Originating in the mountains, water reaches our taps by traveling through an immense network made of six dams, 22 distribution system reservoirs, 15 pump stations, and more than 500 kilometers of supply mains. The entire water system, including the three watersheds — Coquitlam, Capilano, and Seymour — encompasses a total land area of more than 2,600 square kilometers.

W H A T A B O U T T H O S E C R I T T E R S I N T H E W A T E R ?

It is reassuring to know that the GVRD takes the risk of parasites seriously, and in fact, is in the midst of instituting projects that it believes will virtually eliminate any risk. The first of these projects is an ozone generation plant for primary disinfection (already in full operation), installed just below the Coquitlam reservoir in the summer of 2000. Ozone is considered to be effective against parasites and their cysts as long as water turbidity is low. Coquitlam, at a lower elevation with flatter terrain, generally has no turbidity problem. The Coquitlam watershed supplies 20 percent of the GVRD water. For the Capilano and Seymour watersheds — each supplying 40 percent of our water — the recurrent turbidity problem (especially during heavy rainfall) makes water treatment more complex. Initially, ozone treatment alone was planned; it was cancelled because turbidity reduces the effectiveness of ozone for primary

disinfection against parasites. Finally, a plan for a new filtration plant in the Seymour watershed that will filter water shunted from the Capilano watershed as well has been approved and scheduled for completion by 2007. Douglas Neden, Division Manager for the GVRD's Water Treatment Engineering Department, assures us that the proposed anthracite filtration will "lower the turbidity to less than one NTU and probably even below 0.1 NTU." The filtered water will then be fed directly into an ultraviolet (UV) irradiation system for primary disinfection followed by secondary disinfection with chlorine.

Recent research has shown that UV irradiation is effective against parasites, which are not killed, but sterilized, eliminating their capacity to reproduce and cause disease. Because the sediment in turbid water blocks the radiation, UV is only effective when turbidity isn't an issue. Neden notes, "Ultraviolet ends up being simpler and less costly than ozone to build and maintain." There are risks associated with the chlorination of turbid water. When chlorine comes into contact with the organic sediment, it can bind to it and form carcinogenic by-products called trihalomethanes (THMs), so filtration of turbid water prior to chlorination is essential. Chlorine is the most widely used disinfectant worldwide, but is not considered effective against parasites. It is, however, highly effective against bacteria and thus used for secondary disinfection. Now, where does that leave us? Well, 80 percent of the GVRD's water supply (from Capilano & Seymour) will not be treated for parasites or filtered until some time in 2007. When a turbidity "event" occurs in one source (typically Capilano or Seymour), that source may be removed and more water accessed from another source, presumably Coquitlam. As of February 3, Capilano had been removed from service since the previous week,

and the turbidity level at Seymour was 1.5 NTUs. Anything above one NTU prompts an increase of primary disinfection, which currently means increased chlorination, increasing the likelihood of THMs in our drinking water. To sum up, until 2007, our water may still harbor parasites and contain THMs.

When we set our sites on a larger view, beyond the GRVD into other areas of our province and country, the scenario becomes scarier. In 1993, the same year as the Milwaukee debacle, *Cryptosporidium* was also detected in Kitchener-Waterloo. It has since also showed up in Collingwood, Ontario, and more recently in Cranbrook and Kelowna, B.C. As Sierra Legal Defense Fund's 2001 "Waterproof — Canada's Drinking Water Report Card" points out, Canada's regulation and reporting requirements are a patchwork. The highest grade given is a B; British Columbia gets a D. In comparison, the report rates the U. S., which has a more comprehensive approach, with an A. It's one thing to be concerned about parasites in our drinking water, and quite another thing to contemplate whether there may already be parasites happily entrenched in our gut. Not everyone with parasites suffers acute pain and diarrhea. Carriers may be asymptomatic, or have chronic bloating, gas, cramps and pain, irregularity (the typical irritable bowel pattern), or other symptoms. In many cases, the organisms may have been present for years, or even decades. In my twenty-year practice, I have treated thousands of patients for parasites. Sometimes the "needle in a haystack" single stool sample hasn't picked up any organisms, but the classic patterns are there and can be confirmed either with more rigorous lab testing or subtle energetic diagnosis. People complain of everything from digestive and bowel complaints, rashes and allergies, headaches, depression, fatigue, and

PMS, etc., — complaints that their doctors don't have any answers for.

The parasites produce a general imbalance of the gut flora with an unhealthy proportion of organisms such as yeast and pathogenic bacteria, creating a toxic intestinal environment, often with irritation and inflammation. This Dysbiosis is best described by saying that the natural balance or ecology of the gut is disturbed — not enough good guys, too many bad guys. Often, the bad guys have a hand up because of a previous history of antibiotic overuse. The bad guys unfortunately produce too much toxic waste that can set up inflammation, as well as metabolic toxicity down the line. The inflammation can enlarge the size of the pores in the walls of the intestine, allowing overly large food particles to pass through into the first layer of cells, seeding an immune reactivity or allergy. We call this Leaky Gut Syndrome. Dysbiosis can set up all kinds of digestive and bowel problems, as well as food, respiratory, and other allergies. The immune stress incurred often weakens the general immunity creating increased susceptibility to viruses such as colds and flu, fungal infections of the skin, and vaginal candidiasis. There is also a predisposition to other more chronic immune conditions such as Chronic Fatigue Syndrome. The body's toxic load is increased. The liver, kidney, spleen and lymph system are all stressed. Metabolism becomes sluggish, digestion weak, and bowels irregular. General symptoms of toxicity may appear — headache, rashes, nausea, fatigue, blurred vision, depression, etc. Chronic inflammations of joints, muscles, tendons, skin, and other tissues are also common.

In Vancouver, parasites in our water still present a health risk. The new ozonation plant at the Coquitlam Dam is a positive step towards reducing that threat, but as we await the new filtration and UV sterilization facilities planned for

the Capilano and Seymour watersheds in 2007, we have to acknowledge the current risk for both Giardia and Cryptosporidium in the water from these sources. The purity of the water we drink becomes a personal choice. Many of us may want to drink purified water; it is important to know which systems will best eliminate parasites. Pure water is arguably our most precious resource. It sustains all life on the planet. We are fortunate in Vancouver that our municipal politicians have had the vision to act in our best interests. The GVRD is working conscientiously to eliminate the risk of parasites in our drinking water and is on target to succeed by 2007. Until then, it is an individual responsibility to assure the safety of the water we drink. Many of us may have already unwittingly introduced organisms to our system. The good news is that there are safe and natural means to eliminate them, re-establish healthy normal flora, and detoxify our systems. The choice is up to you.

References

GVRD website Water Quality Information:
www.gvrd.bc.ca/services/water/quality
Health Canada 2000 - Drinking Water Quality and Health Care Utilization for Gastrointestinal Illness in Greater Vancouver WATERPROOF – Canada's Drinking Water Report Card, Sierra Legal Defense Fund, January, 2001

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Getting The Bugs Out

- Boiling water (at sea level) kills parasites, bacteria, and viruses.
- Ozonation (of the whole volume of water, not just the cap) typically used in bottled water kills parasites, bacteria, and viruses.
- Reverse Osmosis filtration, which is the forced filtration of water through a semi-permeable .0005 micron membrane, will eliminate all parasites, viruses, bacteria, chemicals (including THMs), and heavy metals.
- UV irradiation will sterilize parasites rendering them incapable of infestation.
- Fine pore ceramic filters will eliminate parasites, viruses, and bacteria.
- Carbon filters will not eliminate parasites, viruses, or bacteria, but may eliminate some chemicals, chlorine, and heavy metals. If not maintained properly, they become a trap for many microbes..