Cross-connecting water problems

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Vancouver CoastalHealth
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Water cross-connections can be the source of contamination for our drinking water, and can be implicated in potentially life-threatening health problems. What?! While this comes as a surprise to most people, it is something that those who look after our drinking water know a lot about.

Most water systems consist of an extensive and complex network of pipes and pumps starting at a water source. For most communities, this is usually an open water source like a distant lake or river. From there, water is guided through pipes and pumps, filters and treatment systems eventually flowing through smaller and smaller water lines until it reaches you, the user.

Problems can occur at any stage of this network, but usually don't because of careful planning and ongoing monitoring. So we are pretty safe. That is, until we look at water from the other end of the pipe: the user's end.

A cross-connection is a direct arrangement of a water line that allows the potable water supply to be connected to a line which contains a contaminant. A good example is that of your garden hose attached to a house faucet with the other end lying in a drainage pool. Ironically, this is the most common offender because the garden hose is connected to good water at one end, and potentially dangerous water at the other.

The problem arises when, for whatever reason, a backflow from the 'bad' end of the hose causes contaminated water to be sucked into the potable water system. In other words, the clean water coming into your home becomes contaminated with whatever is at the other end of the hose. Take it back more than a few feet, and you've contaminated the neighbourhood's water!

Backflow occurs in one of two ways. Backsiphonage is when the pressure in the distribution system drops and water is siphoned from a potential source of contamination into the potable supply. On the other hand, when the pressure in the building's water system exceeds that of the drinking water system, backpressure pushes its water backwards into the potable supply.

Your garden hose is not the only culprit, of course. In one case in California, somehow the water system at an industrial plant had a submerged water line connecting to a vat of lye… right next door to the staff showers. Had there been a backpressure incident, workers might have instantly been showering in lye-contaminated water. In Utah, a doctor was filling his goldfish pond with water and left the hose to fill as he went into the house. Backsiphonage led to his bathtub being inhabited by some of his fish from outdoors. Not deadly, but one does ask, "what else flowed into the system?"

Water cross-connection problems so far sound innocuous enough, but they are not. Preventing such events is not particular difficult, fortunately. The best protection for a community is to introduce a cross-connection control program. This means protecting the potable water system from backflow conditions. It also includes introducing the technical procedures and policies to protect the water from all possible cross connections. The first step is to install devices to protect against cross-connection contamination.

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Having done so much to protect our drinking water from the source down the line to the user, it makes a great deal of sense to protect it from the other end as well. Doesn't it?

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