MERCOLA
Take Control of Your Health

How a Dirty Air Conditioner Endangers Your Health

Analysis by Dr. Joseph Mercola | September 12, 2024

STORY AT-A-GLANCE

- Legionnaires' disease first entered the American consciousness in 1976 when scores of people were sickened and 29 died of a mysterious lung infection at a hotel convention in Philadelphia
- Experts have pointed to what is now called Legionella bacteria found in water sources as the culprits behind Legionnaires' disease, which typically causes pneumonia, as well as vomiting, diarrhea, muscle pain and mental confusion
- The U.S. CDC reports that 8,000 to 18,000 people are hospitalized with Legionnaires' annually, although it takes doctors time to determine what it is, as the symptoms at first seem like a typical, mild respiratory infection
- To ensure optimal air and water quality, clean your air conditioner, heat ducts and filters regularly, and provide filtered water for every member of your family to avoid deadly bacteria

Editor's Note: This article is a reprint. It was originally published November 29, 2017.

Legionnaires' disease first entered the news almost 50 years ago when, according to The Legionnaires' Lawyer,[1] 34 people died from a mysterious respiratory ailment. The same illness emerged again when 12 people at Disneyland became infected with the lung disease, with one fatality. Clues left for investigators to sort out were that the individuals ranged in age from 52 to 94.

One was an employee at the park, eight were visitors and three had not visited the park but had been in Anaheim, California, where Disneyland is located. It ended up being someone who hadn't been to the theme park who died. "Atypical" symptoms include pneumonia, headaches, nausea, diarrhea, muscle aches and mental confusion.

According to Dr. Pamela Hymel, chief medical officer for Walt Disney Parks and Resorts, the source was traced to two cooling towers, in which elevated levels of Legionella bacteria were found.

The towers, while summarily shut down and disinfected,[2] were more than 100 feet from public areas. Following the Disneyworld Legionnaires' disease outbreak, there was another one that occurred at American Airlines when a worker became sick. Investigators found Legionella bacteria, aka L. pneumophila, in four of the airport's maintenance hangars.[3]

Cooling towers were also the culprit in a Bronx outbreak in 2015, killing seven people and infecting 86. Two rooftop air conditioning systems tested positive for Legionella bacteria.[4] When seven people died in Portugal in 2014, the source was again traced to the same bacteria in cooling towers.[5] However, Quartz reported that most cases are traced to hot water tanks, humidifiers, whirlpool spas, fountains, hot tubs and large air conditioning systems.[6]

Deadline Hollywood noted that Legionella show up in contaminated water or mist,[7] and not just in the U.S.; Legionella are becoming a small part of the **water crisis worldwide**. In May 2017, The Wall Street Journal reported the U.S. Centers for Disease Control and Prevention's (CDC's) finding that "Legionnaires' was living or had lived in 84% of nearly 200 cooling towers tested in the United States."[8]

How Cooling Systems Spread Legionnaires'

Over the last few decades, such outbreaks have allowed authorities to immediately look to cooling systems large and small, as they commonly share the same problem — they're not cleaned often enough. According to Newsweek:[9]

> *"The link between cooling towers and Legionnaires' makes sense if you consider how the bacteria live and spread. Cooling towers are basically big water recyclers. Water absorbs heat pretty well — better than air, anyway — so cooling towers bring in air and use water to take some of the heat out.*
>
> *The now-heated water evaporates and is released from the tower; the cooler air gets sent through a building. Legionella, the bacteria that causes Legionnaires', loves water. So if the bacteria are growing in the water in the cooling towers, it is also released from the tower along with the evaporating water."*

It's when several people die from seemingly isolated breakouts that the problem gets the most attention, but the reality is, the CDC reports, 8,000 to 18,000 people end up in a hospital from Legionnaires' every year, although it takes health officials time to determine what it really is, as the symptoms at first seem like a typical, mild respiratory infection.

Also according to the CDC, immunosuppression occurs with a naturally healthy immune system, but it is also influenced by medications, cancer, diabetes and chronic renal disease.

Those most at risk are people over age 50, many either smoke (or used to) and have chronic lung disease, which leaves them more susceptible. The infection is fatal in one in 10 cases.[10] One thing that connected the dots for investigators was that outbreaks often occurred in summer months; in Pennsylvania and the Bronx, the worst cases happened in July, although in areas where it's warm all year it could happen any time.[11]

History of Legionnaires' Disease

A severe respiratory illness that broke out in Pennsylvania in 1976 was the first time its unique symptoms and subsequent "body count" had doctors and scientists desperately scratching their heads because they had no idea what it was or what caused it. Besides the 34 people who died, 221 became seriously ill. Because it occurred at a statewide American Legion convention, it was called Legionnaires' disease.

Scientists first pointed to a pneumonia-causing bacterium, one known as rickettsia, transmitted by mites, ticks or lice but, understandably, as people continued dying, speculation was rampant.[12] Newspaper reports of the outbreak hinted at biological and chemical warfare and accusations of a governmentwide cover-up.

Some thought it was a CIA experiment, parrot fever, swine flu or the plague. Others thought it might have something to do with extraterrestrials; many thought the whole thing was a hoax.[13] As the Legionnaires' Lawyer noted:[14]

> *"It wasn't until December 1976 that Dr. Joseph McDade, a CDC laboratory scientist, using the technique of guinea pig inoculation, was able to isolate the bacterium that caused the disease and identify it as Legionella pneumophila. It was further determined that the bacillus had apparently spread from the hotel's air conditioning system.*
>
> *In April 1977, the term Legionnaires' Disease was first published by the CDC as the official name of the epidemic disease that had caused such a national stir."*

More History of the 'Unclassified Agent'

Hindsight so often being a good teacher, once the cause of the disease had been identified, scientists began working backward from the watershed "incident" in Philadelphia in 1976. Experts have since learned that the genus Legionella comprises about 40 named species and subspecies.

- What for a while was called a "new" bacterium, a previously unidentified "unclassified agent" isolated as early as 1947 was identified as Legionnaires'.[15]
- In Austin, Minnesota, in 1957, 78 workers developed pneumonia at a Hormel Foods Corp. meat packing plant. Undetermined at the time, 22 years later tests showed survivors to have had significantly elevated levels L. pneumophila antibodies in their blood. The source was identified as the plant's cooling tower.[16]
- In 1965, 81 patients developed pneumonia at St. Elizabeth's psychiatric hospital in Washington, D.C., and 14 died. Stored serum specimens in 1977 confirmed it was L.

pneumophila. The probable delivery agent — water from a lawn-sprinkling system being excavated.[17]

- In late summer of 1978, an outbreak occurred at a Memphis, Tennessee, hospital. Of the 44 ill, 39 included patients, employees and passersby. With an incubation period of two to 10 days, the onset "correlated precisely" with the use of the hospital's auxiliary air conditioning cooling tower. L. pneumophila was recovered from two water samples receiving air from intakes near the cooling tower.[18]
- When people who worked at or visited the Pontiac, Michigan, health department came down with the same symptoms in 1968, it was simply called Pontiac disease. Later, it was determined to be Legionnaires',[19] but mild cases are sometimes called Pontiac's disease.[20] Unfortunately, these incidents are just a drop in the bucket.

'Body Count' in Flint Attributed to Legionnaires' Disease

Flint, Michigan, became a household name due to an "ill-thought-out attempt at cost savings" when the city's (state-appointed) emergency manager changed the city's water supply from Lake Huron to the Flint River in 2014. To save $100 a day, they decided not to add anticorrosives, which was a violation of federal law, Forbes[21] reported, quoting Michigan's Department of Natural Resources (DNR) Flint River Assessment:[22]

> *"Historically, the water in the Flint River downstream of Flint has been of poor quality, and was severely degraded during the 1970s due to 'the presence of fecal coliform bacteria, low dissolved oxygen, plant nutrients, oils and toxic substances.'*
>
> *In 2001, the state ordered the monitoring and cleanup of 134 polluted sites within the Flint River watershed, including industrial complexes, landfills and farms laden with pesticides and fertilizer … The river was found to be 19 times more corrosive than the water from Detroit, which was from Lake Huron, according to study by Virginia Tech."*

A Virginia Tech investigative team found Flint's water to contain 1,000 times higher levels of Legionella bacteria than they "expected."[23] The debacle was referred to as a downhill "cascade" by the health officials parsing out what went wrong where. Corrosion of iron leaching from old iron pipes, which both stimulated the Legionella growth and inactivated the chlorine disinfectant health officials had begun plying the water with to kill the bacteria, was noted.

It was a medical, governmental and public relations nightmare, with frequent on-and-off boil-water advisories due to **E. coli contamination**, the release of carcinogenic total trihalomethanes (TTHM) and a significant uptick in lead content. Projected costs for remediation were staggering, not to mention the toll on families.

However, Flint's MLive News noted that while 12 deaths from Legionnaires' were reported in the wake of Flint's tainted water, there were likely many more. MLive reported on a courtroom testimony from Dr. Marcus Zervos, head of Henry Ford Hospital's Infectious Diseases division and co-principal investigator of Wayne State University's study of Flint's water contamination crisis, explaining:[24]

> *"According to the state's public health criteria, Legionnaires' must only be listed as a cause of death of a person if they die from contracting the bacteria during hospitalization or 30 days after being discharged.*
>
> *For example, Zervos said, if a patient contracted legionella bacteria while in a hospital, but died six months later after the bacteria weakened their heart, their cause of death — by public health definition — would be 'heart failure,' but could be considered by disease specialists to be precipitated by legionella."*

Six people were ultimately charged with involuntary manslaughter.[25] Currently, the water in Flint is said to meet the Environmental Protection Agency's (EPA's) Lead and Copper Rule.[26]

How to Avoid Legionella Bacteria

Spanish authorities were flummoxed when an epidemic of pneumonia struck (at least) 150 British tourists staying at a hotel in a coastal resort town between 1973 and 1980. The hotel's potable water system was identified as the source.

But when changes to the hotel's plumbing, water chlorination and hot water temperature were made, the "multiyear epidemic" ended.[27] People with the disease are treated with antibiotics, but **antibiotic resistance** is rampant due to overuse, especially by industrial agriculture.

The fact is, depending on where you are in the world, including in the U.S., drinking water from taps or fountains are anything but safe. Norovirus, E. coli, Shigella and giardia have been identified in many outbreaks. Additionally, pharmaceuticals and other chemicals, including **fluoride in the water**, have sickened people.

Ensuring a source of pure, filtered water for every member of your family, whether they're drinking it at school, work or elsewhere, is the safest way to avoid deadly bacteria. Achieve this by filtering your tap water and taking it with you in safe, nontoxic and reusable bottles when you're out and about. Talk to your kids about the importance of what they eat and drink, because toxins are real, not a scare tactic.

In fact, more than 267 different toxins have been found in **public tap water**. Talking to school officials about toxins or bacteria in the school's water is also in order. Regarding water systems, the CDC has provided a number of recommendations[28] for building owners and managers, state and local officials and health care providers to become informed and learn how to clean and maintain water management systems and implement programs to prevent Legionnaires' outbreaks.

Take Care of Your Air Conditioning Systems to Prevent Illness

Most people don't even consider their **uncared-for air conditioner might be toxic** and sapping their health. The compressor might be outside your house, but inside, often in the attic or basement, is usually where the condensation occurs. The pan that sits underneath the handler to collect it is connected to a drain tube. The pans get plugged

fairly frequently, and that, unfortunately, creates an extremely friendly environment for harmful bacteria to grow.

Cold weather that transitions to hot water, which then sits there indefinitely, becomes stagnant. It even influences the sometimes-discolored scaly buildup on metal pieces, indicating the accumulation of deadly bacteria. Further, if you find yourself in a hotel room or some other environment where the **indoor air quality** is slightly unpleasant and maybe even reminiscent of mildew or mold, consider it the source of a problem.

Especially when you travel and come home with a head cold or respiratory problems, these types of environments could explain it. A runny nose, fatigue, dizziness, forgetfulness, scratchy throats and headaches are a few signs that your indoor air or water quality is not the best. Here are tips to ensure you're doing what you can to prevent health problems from questionable air and water quality:

- Mold grows in damp and humid environments, so the use of a dehumidifier and air conditioner keeps your humidity under 50%.
- Because indoor air contains two to five times, and in some cases as much as 100 times, more contaminants than the air outdoors, investing in a whole-house air purifier is recommended.
- Check your air conditioning unit at regular intervals to make sure it's draining properly. Be sure the drain pan for the handler stays empty. Spray white vinegar on the actual A-frame, known as the condenser.
- Air ducts from forced air heating and air conditioning units cause pollution in your home. If there's dust, mold growth or signs of unwanted guests like mice, it's time to call a professional and have the air ducts cleaned.
- Change your furnace filters every three months, or more often if necessary, if they appear to be dirty.

Purifying your home's air is also important. Photocatalytic oxidation (PCO) is one of the best technologies available. Rather than filtering the air, PCO actually acts as an air purifier, cleaning the air using ultraviolet (UV) light. Unlike filters, which simply trap

pollutants, PCO transforms the pollutants into nontoxic substances. In addition to using them in your home, portable air purifiers are available to take with you when you work or travel.

Sources and References

- [1, 13, 14, 16, 17, 19, 27] The Legionnaires' Lawyer 2017
- [2, 7] Deadline Hollywood November 11, 2017
- [3, 9] Newsweek November 13, 2017
- [4, 6] Quartz August 5, 2015
- [5] Newsweek November 13, 2014
- [8] The Wall Street Journal May 3, 2017
- [10] Centers of Disease Control and Prevention January 24, 1997
- [11] Journal Times September 2, 2017
- [12, 21, 23] Forbes November 13, 2017
- [15] Ann Intern Med. 1979 Apr;90(4):659-61
- [18] N Engl J Med. 1980 Feb 14;302(7):365-70
- [20] US News November 15, 2017
- [22] WRAL News, March 5, 2016
- [24] Flint MLive News September 21, 2017
- [25] Reuters June 14, 2017
- [26] Virginia Tech September 15, 2017
- [28] CDC, Public Health Strategies for Legionella Control