

THE TIME BOMB

OR

PLAYING WITH FIRE

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Pneumonia associated with a dental unit waterline

The Lancet, [Volume 379, Issue 9816](#), Page 684, 18 February 2012

The most recent article published in the British Medical Journal Lancet, highlights a very serious problem dentistry has been faced with for many years; contaminated dental unit water lines.

The report in Lancet outlines the case of an 82-year-old woman who was admitted to the intensive care with a fever and respiratory problems. Several tests were run and Legionnaires' disease was diagnosed. In spite of rapid treatment, the patient developed fulminant and irreversible septic shock and died 2 days later.

Through the investigation, it was determined the woman had not been exposed to any obvious risk for legionella infection in the previous 10 days, and had only left her house to attend two dental appointments.

Samples taken from the dental unit waterlines at the dental practice were positive for *L pneumophila*. Biologic testing confirmed identical genomic patterns between the samples received from the patient and those in the dental office dental unit waterlines confirming where the source of the patients infection and subsequent death came from.

The media all over the world has covered this story. On February 17, 2012 ABC Good Morning America covered the story as well as many web based news organizations.

<http://abcnews.go.com/Health/woman-contracts-legionnaires-disease-dental-water/story?id=15699616#.T1fGRnJSSAR>

In the past two years, there have been two major exposures in government dental clinics where hundreds of dental patients were exposed to pathogenic microbes and possible hepatitis and HIV viruses from dental procedures, had to be recalled and tested for exposure. This is a very dangerous and very costly situation to say the least.

Where are the dead bodies?

There are reported deaths from exposure to pathogenic microbes originating from dental unit waterlines. Starting with the latest person covered by the media in February 2012, one only has to search the literature to find more deaths related to

exposure from DUWL. California reported two deaths of dentists from legionella infection traced to their waterlines. Atlas R M, Williams J F, Huntington M K. *Legionella* contamination of dental unit waters. *Appl Environ Microbiol* 1995; **61**: 1208–1213. | [PubMed](#) | [ISI](#) | [ChemPort](#) |

Many cases have been served in courts, but have been settled without trials keeping the news from the media. There are literally hundreds of articles about microbial contamination of dental unit waterlines, biofilm problems, cross-infection and contamination problems, and deaths related to pathogenic microbes from dental unit waterlines in the scientific literature.

Yet, dentistry refuses to deal with the problem with the same infection control standards applied to other critical instruments and procedures. Even in the lab, when polishing a denture, the standard protocol is to use disposable rags wheels once and dispose, yet we continue to spray contaminated water into patients mouths where they breath the aerosol mist, and into open wounds from the procedures dentistry performs.

The problem is not the water; the problem is the WATER LINES.

Bioforms from every previous patient that had a procedure done with that unit are in the water lines, growing in the biofilm on the inside diameter of the lumen. Sterile water can be placed in the reservoir bottle, but the biofilm remains, breaks off, and is sprayed in the next patient's mouth and lungs. Flushing, chemicals, tablets, etc., are applied and do lower CFU counts, but they do not eliminate them. It is not a sterile environment.

Where does the problem come from?

Laminar flow is a term used in fluid dynamics to explain the physics of fluid behavior as it flows through a tube. During the active flow of a fluid (water spraying from a handpiece or syringe) in one direction, passive retraction of fluid (laminar flow) is going in the opposite direction at the same time pulling along with it the bioforms from the patient's mouth inoculating the water in the dental unit waterlines and reservoir.

If true colony forming counts can be kept below 200 CFU, which bioforms do you want to have in the line? Do you monitor the CFU count before and after every patient? Over 200 species of bioforms have been cultured from dental unit water. How can you control the pathogenic species that are in the line? Random testing of dental unit waterlines typically show CFU count 400X that of the local water supply. *British Dental Journal* **201**, 565 - 569 (2006)
Published online: 11 November 2006 | doi:10.1038/sj.bdj.4814206
Many lines have been measured at $>10^6$ CFU/ml.

There is only one standard of sterile.

Disinfection is not sterile. 500 CFUs is not sterile. 200 CFUs is not sterile. Flushing does not sterilize. Chemical shock does not sterilize. Occasional tablets do not sterilize. Filters do not sterilize.

There is only one sterile in the standard of sterile. The only sure way to sterilize is to autoclave.

The three components of sterile delivery.

There are three components in the delivery of operatory dental procedures:

1. The **handpiece**
2. The **water line**
3. The **water/water reservoir**

All three must be sterilized for every procedure. This is true separation between patients.

All three must be sterile to perform a sterile procedure. A breach in any one of the three renders the procedure non-sterile.

The Gold Standard in Sterile Delivery

It is time to fill in the missing link in sterile delivery in dentistry. It is time to stop playing with fire; to wait until something more terrible happens like the woman in Italy; to keep turning our collective back on the glaring hole we leave in infection control in sterile dental procedures.

AquaSept give us that option. The AquaSept dental delivery system has been giving dentistry the sterile option since 1995 and is still the Gold Standard in sterile delivery.

AquaSept is easy to use, efficient, and cost effective. AquaSept is easy to autoclave sterilize between every patient. Let's bring dentistry up to the Gold Standard of Sterility.