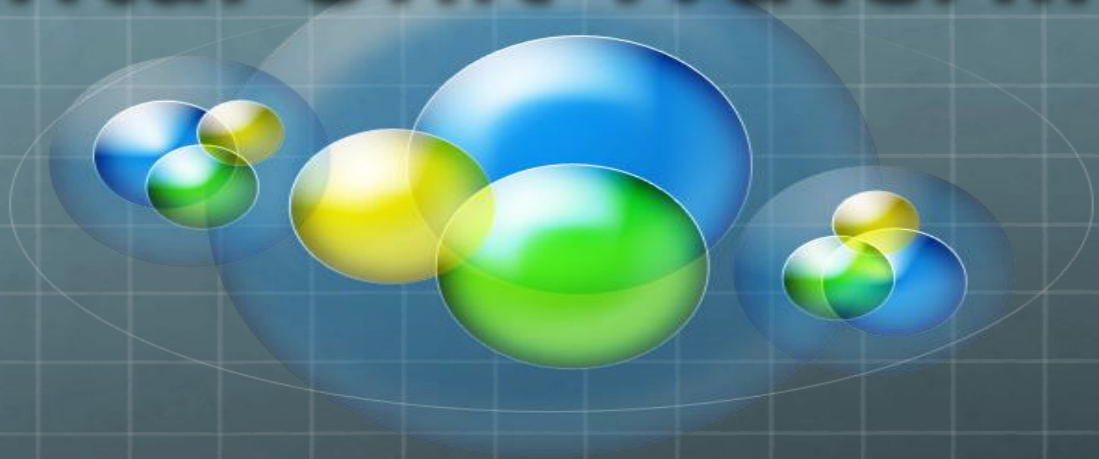
Dental Unit Waterlines



Biofilm and water quality

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References

- ADA / Oral Health Topics – Dental Unit Waterlines: http://www.ada.org/en/member-center/oral-health-topics/dental-unit-waterlines
- Guidelines for Infection Control in Dental Health-Care Settings / 2003 : http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5217a1.htm
- Dental Unit Waterline And biofilm CDC PP
- CDC – Boil-Water Advisories and the Dental Office
- Dental Unit Water: What are You Doing About Yours? Kay C. Carl, RN, BS /AzDa.org

What Is a Biofilm?

1. A biofilm is a group of microorganisms in which the cells stick to each other on a surface. These cells are embedded within a self-produced extracellular matrix. Biofilms may form on living or non living surfaces and can be prevalent in natural, industrial and hospital settings

2. Microorganisms within the biofilm can be more resistant to disinfectants

3. Bactria within a biofilm are much more resistant to antimicrobials than the same bacteria in a suspension

4. Biofilms have been found in whirlpools, dental waterlines, medical devices, hemodialysis systems, central venous catheters, endoscopes

Biofilm and Dental Units

1. Dental unit waterlines: tubing that carries water to
    1. High-speed
    2. Air/water syringe
    3. Ultrasonic scaler
2. can become colonized with bacteria, fungi, and protozoa forming a biofilm
3. Biofilm serve as reservoir for bacteria and increases the number of free-floating cells in the water used in the dental unit
4. Guidelines for infection control in dental health-care settings were written in 2003 by the CDC

What kind of microorganisms are we talking about?

1. Primary source of the microorganisms is the municipal water
2. Oral flora, human pathogens and non-tuberculous Mycobacterium species have been isolated from dental water systems
3. scientific evidence verifies the potential for transmission of waterborne infections and disease in hospital settings and in the community
4. Health-care associated transmission of pathogenic agents (e.g., *Legionella* species) occurs primarily through inhalation of infectious aerosols
5. Disease outbreaks in the community have also been reported from diverse environmental aerosol-producing sources, including whirlpool spas, swimming pools, and a grocery store mist machine.

To Put It in Perspective

1. EPA standards for drinking water is equal or less than 500 CFU/mL
2. Research established that microbial counts can reach in the hundreds of thousands of CFU/mL within days of of new dental unit waterlines installation
3. Colony counts in water of untreated dental unit water can be more than 1 million CFU/mL
4. Untreated dental units cannot ensure delivering water that meets drinking water quality
5. Using water of uncertain quality does not meet the standard of care and inconstant with infection control in the dental office.
6. Can be regarded as an ethical issue: “unprofessional conduct” if a concern arises

1. Infection associated with dental unit waterlines microbial contamination is rare
2. Elderly and Immunocompromised patients are at risk
3. In 2012, a case report was published concerning an 82-year-old otherwise healthy woman who developed Legionnaire's disease after a dental visit.(updates the 2004 ADA statement)

CDC recommendation

(supported by ADA and BODEX)

1. For non surgical procedures, water should not exceed 500 CFU/mL (the safe level for drinking water)

2. For surgical procedures, sterile water or sterile saline for irrigation as a coolant (the dental unit water is bypassed) and use single disposable use devices or tubing

Boil-Water Advisory

- What do you do in the event of boil-water advisory?
- Boil-water advisories have resulted from contamination of public water systems
- Do not deliver the water to patients
- Patients must use distilled water for rinsing
- Tab water should not be used for hand hygiene (unless water been boiled and cooled). Use bottled water or alcohol based hand rub products
- Tab water should not be used to dilute germicides (unless water been boiled and cooled)
- Follow instructions after cancelling the advisory

The Solution

- Monitoring and testing the quality of water in the dental unit
- Using purified water is not enough