

Learning Your Lines
Colorado Dental Hygiene Association
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Why do we care about dental unit waterlines?

Biofilm:

- Biofilm is growing in the small dental tubing because of a high surface-to-water flow ratio.
- Bacteria can reach 200,000 CFU/mL in less than 5 days in brand new lines

*Barbeau J., Tanguay R., Faucher E., Avezaard C., Trudel L., Cote L., Prevost AP. Appl Environ Microbiol 1996; 3954-9

Patients:

- Patients have died or been hospitalized because of contaminated dental unit waterlines.

Clinician:

- What are we breathing? Dental Unit waterlines are a major basis of aerosol bacteria in the dental environment

Kumar, P. and Subramanian, K., 2020. Demystifying the mist: sources of microbial bioload in dental aerosols. *Journal of Periodontology*.

Meethil, AP, Saraswat, S, Chaudhary, PP, Dabdoub, SM, Kumar, PS. 2021. Sources of SARS-CoV-2 and other microorganisms in dental aerosols. *J Dent Res July 2021*

CDC Guidelines

- Even if your state hasn't adopted CDC guidelines we are still required to provide a safe dental visit.
- Most Dental Equipment Manufacturers have updated their IFUs in the last few years to protect themselves from the new FDA recommendations for Dental Unit Manufacturers:
<https://www.fda.gov/medical-devices/dental-devices/dental-unit-waterlines>

How:

Shock- use a strong disinfectant to clean the lines

- Shock Before Initial Use of a Water Treatment Product
- Shock at least every quarter
- When your waterline test reveals a contamination level of 200 CFU/ml or more

Test- the only way you know if your lines are in compliance and your product is working.

OSAP recommends testing monthly on each dental unit, if you pass for 2 consecutive monthly cycles move to quarterly testing

- Mail-in testing
- In-Office testing

Treat- using a low-level antimicrobial to maintain clean lines.

No matter what product you choose you must follow the instructions for use!

- Tablets
- Straws
- Liquids

Maintain- establish a Standard Operating Procedure (SOP) and make sure the entire team understands the why.

- Appoint a Waterline Warrior
- Test and Document your results
- Flush lines at the beginning of the day and in between patients
- Choose a maintenance product and use it according to the IFUs
- Re-test quarterly (and document)
- Shock as needed

Suction

Why:

- Aerosols
 - Covid opened the doors to a conversation that's been happening since the 60's
- Safety
 - Keeping aerosols in Zone 1 is optimal
 - Devices can control up to 100% of aerosols if the vacuum system running optimally, even with sub-optimal placement.
 - Ideally, flow rate should be between 7.1-10.6 SCFM to control aerosols
 - Both Flow rate and Vacuum are needed to control aerosols and fluids
- Patient Comfort and safety
 - A well functioning suctioning system will keep the patient comfortable without interruptions
 - When a patient closes on the saliva ejector or the tip becomes occluded, **backflow** may **occur** due to a temporary drop in vacuum pressure.
 - Suction Adaptors need to be reprocessed, check your IFUs
 - HVE is necessary for capturing Aerosols
 - Saliva Ejectors only capture 38% of Aerosols
- Equipment Longevity
 - In order for any suction devices to function properly, the vacuum must be working optimally

How:

- Establish SOPs to keep your suction lines clean
 - Run suction lines daily (and sometimes in between patients) using a dispenser
 - Use an EPA 2020 compliant suction product
 - pH between 6-8, non-foaming, no chlorine, chelating agents
 - Run lines from furthest from the vacuum to closest
 - Change your chair traps weekly
 - Change your big trap at least monthly
 - Check your Amalgam separator trap

Resources:

•Aerosol and spatter mitigation in dentistry: Analysis of the effectiveness of 13 setups, 2021, JC Comisi, TD Ravenel, A Kelly, ST Teich, W Renne, 10.1111/jerd.12717, Journal of Esthetic and Restorative Dentistry

•EPA rule on suction cleaner:

<https://www.federalregister.gov/documents/2017/06/14/2017-12338/effluent-limitations-guidelines-and-standards-for-the-dental-category#p-134>

•Aerosol reduction by means of an intraoral spray mist suction-first findings from an experimental pilot study: <https://www.airtechniques.com/wp-content/uploads/AT-White-paper.pdf>

•Zeinali T., Bozorgvar E., Habibi M., Akbari N., Barikbin B. **Suction hoses of dental units as a potential source of microbial contamination** Oman Medical Journal, Volume 35, 2020

•Overcoming the problem of residual microbial contamination in dental suction units left by conventional disinfection using novel single component suction handpieces in combination with automated flood disinfection 2015 M Boyle, M O'Donnell, R Russell, N Galvin, J Swan, D Coleman 10.1016/j.jdent.2015.07.018 Journal of Dentistry

•Micik R. E. et al., Dent Res Jan-Feb 1969 "Dental aerobiology is the study of airborne particles in the dental office"

•Pine, Pat. (2017, November 1). *A case study of evacuation valves reveals hidden danger to dental patients.* RDHmag.com.

[https://www.rdhmag.com/patient-care/article/16409704/a-case-study-of-evacuation-valves-reveals-hidden-danger-to-dental-patients.](https://www.rdhmag.com/patient-care/article/16409704/a-case-study-of-evacuation-valves-reveals-hidden-danger-to-dental-patients)