INFECTION CONTROL
In Practice

OSAP.org The Safest Dental Visit™

Vol. 22, No. 4 August 2023

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IN EACH ISSUE

Infection Control in Practice focuses on infection prevention and control basics, strategies, and tools to:

- maintain a safe work environment
- limit the spread of contamination
- promote compliance with infection prevention guidelines in dental facilities.

This will help the Infection Control Coordinator (ICC) communicate the importance of **the safestdentalvisit™**

WHAT'S IN THIS ISSUE

TEAM HUDDLE: Dental Unit Waterline Management. Don't Assume Biofilms Are Gone!

Hidden within narrow dental waterline tubing, where water flows intermittently and slowly, persistent mixed communities of bacteria, fungi, and protozoa naturally attach and form a protective biofilm on the narrow tubing surfaces.

This issue explores what pathogens and infections might be transmitted by waterlines, how you and your patients might be exposed, and what is required and being done to reduce that risk. Safe dental water requires constant management. Is your dental unit water safe?[1,2]

LEARNING OBJECTIVES

After reading this publication, the reader should be able to:

1. Understand the risks associated with exposure to unsafe dental unit water.
2. State the dental water standards for surgical and non-surgical procedures.
3. Describe and perform procedures needed to manage dental water quality.
4. Create a written checklist or Standard Operating Procedure to guide and record maintenance protocol.

Infection Control In Practice Team Huddle™ is a resource prepared for clinicians by the Organization for Safety, Asepsis and Prevention (OSAP) with the assistance and expertise of its members. OSAP is a nonprofit, independent organization providing information and education on infection control and prevention and patient and provider safety to dental care settings worldwide. ICIP Team Huddle™ is published six times per year and is a trademark belonging to OSAP. OSAP assumes no liability for actions taken based on information herein.

TEAM HUDDLE: Dental Unit Waterline Management (cont'd)

Dental unit waterline (DUWL) biofilm contamination has been recognized as a safety risk in dentistry since the 1990s and was included in the Centers for Disease Control and Prevention (CDC) Dental Infection Control Recommendations in 2003.

Since then, many serious cases and outbreaks have shown that patients and workers have been infected by contaminated dental treatment water, including the death of a patient from *Legionella* and hundreds of life-changing infections in children following pulpotomies.

In October 2022, the CDC issued a Health Alert to notify dentistry and the public about this very real and ongoing risk. Many dental workers may assume the problem is under control, but they and their patients may still be at risk. DUWL management methods can control, but not eliminate the safety risks. If mistakes are made, the risk can rise, undetected.[1,2,3]

Workplace Scenario: The Situation

A college biology professor recently visited Dr. John's dental practice where the dental hygienist completed a thorough oral prophylaxis, which went well. However, the professor returned to the office a week later, asking to speak to Dr. John privately about an urgent concern.

The professor complained about swelling in his gums that began hours after the cleaning. He also went on to describe the "unpleasant musty smell and taste" of the water coming from the dental hygiene equipment in room 3 that he noticed last week. The professor showed Dr. John the public CDC Health Alert Network (HAN) Health Advisory: "Outbreaks of Nontuberculous *Mycobacteria* Infections Highlight Importance of Maintaining and Monitoring Dental Waterlines", dated Oct. 31, 2022.

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Workplace Scenario: The Situation (cont'd)

The professor was very concerned about possible nontuberculous *Mycobacteria* (NTM) infection. He asked what the office was doing to manage their waterlines.[1] He had read that contaminated dental water could infect workers and patients when they swallowed or breathed in the water, and open tissue or bleeding areas might absorb the pathogens and lead to infections including abscesses.

Dr. John answered that he was well aware of dental water issues and how to manage that risk, but he had not yet read the HAN advisory. He had heard that it was about infections following pulpotomies, and the recommendation to perform surgeries, including pulpotomies, with sterile water.

Since the office referred most surgeries and did not work on children, Dr. John assumed the health advisory didn't directly apply to their office. The professor pointed out that the advisory directed dentists to treat their dental unit water to ensure the water was safe (potable) for non-surgical procedures, in addition to using sterile water for surgeries.

Dr. John immediately examined the professor's tissues and confirmed that they were healing well and thanked the professor for sharing his concerns directly with him. Dr. John explained how the dental water was treated to ensure safety and promised that the water in the hygiene operatory would be tested immediately, along with the whole office.

Scenario: The Situation Assessment and Action Plan

That day, Dr. John read the HAN Health Advisory carefully and called a meeting to discuss the issue with his dental team and to set up an action plan. He made copies of the HAN Advisory for everyone.

They discussed the directions for their daily waterline germicidal product and discovered that the waterline treatment cartridge installed on the hygiene room's dental unit had expired. The hygienist worried that biofilm had grown to high levels since the patient had noticed the bad taste. She had an in-office waterline test kit and drew a water sample to test the water in the hygiene dental unit.

They also discovered another problem. An adjacent operatory, used mostly for exams and taking X-rays, was connected to the city water supply. Therefore, they could not access the water to manage its quality. They realized this room would now need to be retrofitted with a self-contained waterline management system that could be fully maintained. This was a wake-up call!

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Scenario: The Situation Assessment and Action Plan

The Doctor and his Infection Control Coordinator created the following action plan for their office, based on state regulations, CDC guidelines, manufacturers' directions, and links to resources on the Organization for Safety, Asepsis, and Prevention (OSAP) website.

Scenario: Action Plan for Safe Dental Water	
1	Stay up-to-date and informed on publications and research.
2	Calibrate the safety team: inform and train all team members about dental water risk and safety, management, and recordkeeping.
3	Create a dental unit waterline Standard Operating Procedure (SOP) and assign duties.
4	Correct equipment problems a. Install a self-contained dental water system with a separate reservoir in the unit that is directly plumbed to the municipal water supply. b. Clean (shock) waterlines. c. Treat all dental unit waterlines with a continuous germicide. d. Replace DUWL germicidal cartridges when or before they expire. e. Test all DUWLs. f. Use separate sterile water and sterile syringes for surgeries.

6 Strategies for Dental Unit Waterline Management

Strategy 1: Recognize DUWL Risk[1,2,3,4,5]

Cooperative, opportunistic pathogens are present in non-sterile water, ready to grow and reproduce when the conditions are right, whether in dental tubing or human tissue.

Narrow-bore DUWLs have the perfect biofilm-forming conditions: slow or intermittent water flow, high surface area-to-water volume ratio, optimal temperatures, and many opportunities for bacteria and nutrients to enter the system. Biofilm formation is rapid: untreated waterlines are likely to build up biofilm resulting in contamination levels above 500 CFU/mL within 5 days.

Organisms enter the DUWLs via the source water, at open equipment connections, and by fluid retraction through handpieces during patient care. Consult the dental unit manufacturer regarding the need for maintenance of anti-retraction valves.

Water contamination is measured by the number of colony-forming units per milliliter of bacteria (CFU/mL). There are two standards for dental water safety:

1. sterile water or saline with 0 CFU/mL for surgical procedures (including pulpotomies, extractions, and when entering bone and tissue), and
2. "potable" water with less than 500 CFU/mL for non-surgical procedures.

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6 Strategies for Dental Unit Waterline Management (cont'd)

Strategy 2: Understand Pathogens, Infections, and Modes of Transmission[1,2,3,4,5]

Biofilm-related illnesses are contracted by inhalation, ingestion, and absorption through mucosal, ocular tissue, and open tissue. Biofilm pathogens can colonize oropharyngeal and gastrointestinal tissue. Endotoxins, released from live or dead DUWL bacterial cell walls, can cause inflammation and shock. Healthcare workers should understand the potential risk and should protect susceptible workers and patients from exposure to DUWL pathogens.

Surgical procedures performed with unsterile dental unit water can result in bacterial invasion of the site and bloodstream, such as abscesses following pulpotomies. Treating DUWLs reduces these contaminants but does not sterilize the output water; therefore, only sterile water or saline, delivered by a separate sterile delivery system, should be used for surgical procedures.

Most pathogens found in dental water are "water-derived" (commonly found in water), but some are "human-derived" (introduced into the DUWL from hands or patients' mouths).

Representative Water-derived Dental Water Pathogens
How They Are Transmitted and What They Cause:[1,3,4,5,6,7]

Pathogen	How They Are Transmitted	What They Cause
Mycobacterium abscessus	Skin opening, inhalation	Tissue infection, pus, abscess
Legionella pneumonophila and other *Legionella* species	Inhalation or aspiration of aerosols	*Legionnaires disease* (pneumonia), Pontiac Fever (flu-like illness), wound infection
Pseudomonas aeruginosa, P. cepacia	Skin opening, inhalation	Pneumonia, urinary tract infections, oral, wound and respiratory infections, septicemia
Acanthamoeba species (protozoa)	Skin opening, inhalation, ocular tissue absorption	Infections of: eyes (***Acanthamoeba* keratitis**); Brain and spinal cord (**Granulomatous Encephalitis**, often deadly); entire body (**disseminated infection**, **gastroenteritis**)
Cephalosporium and *Cladosporium* species (fungi)	Inhalation	Sinus and lung infections, allergies
Lipopolysaccharides (LPS) or endotoxins	Inhalation, ingestion, mucosal tissue absorption	Asthma, skin rashes, gastrointestinal reactions, delayed wound healing, shock. LPS may be related to living or dead organisms.
Cryptosporidium	Ingestion	Gastrointestinal infection, dehydration
Giardia	Ingestion	Gastrointestinal infection, diarrhea

Representative Patient-derived Pathogens
How They Are Transmitted and What They Cause:[1,3,4,6,7]

Pathogen	How They Are Transmitted	What They Cause
Staphylococcus aureus and other *Staphylococcus* species	Skin or mucosal opening	Wound infections, septicemia
Streptococcus species	Inhalation, mucosal absorption	Respiratory/systemic infections, endocarditis, meningitis
Klebsiella pneumoniae	Inhalation, open tissue	Pneumonia, sepsis, meningitis
Oral flora	Mucosal and wound absorption, ingestion, inhalation	Transmission of periodontal pathogens

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6 Strategies for Dental Unit Waterline Management (cont'd)

Strategy 3: Do What It Takes to Manage Dental Water Quality[1,2,5,8,9]

Dental waterlines must be treated continuously to control microbes and biofilm by adding low-level germicides to the DUWL daily. Periodically, stronger chemicals are used to "shock" the lines, aggressively removing built-up attached biofilm.

- DUWL daily germicides are safe enough to breathe and swallow, so they may allow biofilms to return over time. DUWL daily germicides will extend the time between required shock treatments from weekly (if no continual germicide was used) to monthly or quarterly.

Noticeable taste or odor indicates grossly contaminated water, but grossly contaminated water may also be odorless, colorless, and clinically undetectable.

- Since it is difficult to detect unsafe levels of water contamination, waterline testing is necessary to ensure dental water safety and to determine the need to shock. Action should be taken before contamination reaches the recognized "unsafe" level of 500 CFU/mL. Some countries use a lower threshold for action (100 – 200 CFU/mL).

Some equipment and product manufacturers recommend a schedule for testing and shocking waterlines, but if they do not, empirical evidence suggests monthly or quarterly testing.

- Ultimately, the dentist is responsible for providing safe dental water for workers and patients and should treat continuously, test regularly, and shock as indicated to achieve that standard.[1,2,5,8,9]

Strategy 4: Know the Options for Dental Unit Source Water[1,2,5,7,8,9]

Fresh municipal (faucet) water is likely to meet potable drinking water standards but contains low numbers of biofilm-forming microbes and low levels of water-treatment chemicals such as chlorine, fluoride, and dissolved solids. Within dental waterlines, chlorine dissipates, biofilms form, and microbes proliferate due to intermittent or non-use and slow water movement. Dissolved solids in municipal water may reduce DUWL germicide effectiveness. Filters that remove total dissolved solids (TDS) do not remove microorganisms.

Fresh distilled water is not sterile. Microbes can grow rapidly in distilled water, so freshness is important. In-office water distillers grow biofilm and can become a contaminated water source; they must be treated to prevent biofilm growth. Stored (not fresh) distilled water can have high numbers of bacteria and fungi. Distilled water may be corrosive to equipment materials.

Fresh filtered water is not sterile. The quality is variable, depending on the source, the cleanliness of the filter, and the quality of the filtration system.

Commercial drinking water is not sterile and may contain low numbers of organisms, but must meet quality standards. Use this water before the expiration date.

Sterile water or saline must be used for surgery, and delivered through sterile devices. If used to fill the dental unit reservoir, the sterile water will immediately become contaminated by the dental unit tubing. Adding sterile water to dental unit reservoirs does not provide sterile water for surgery.

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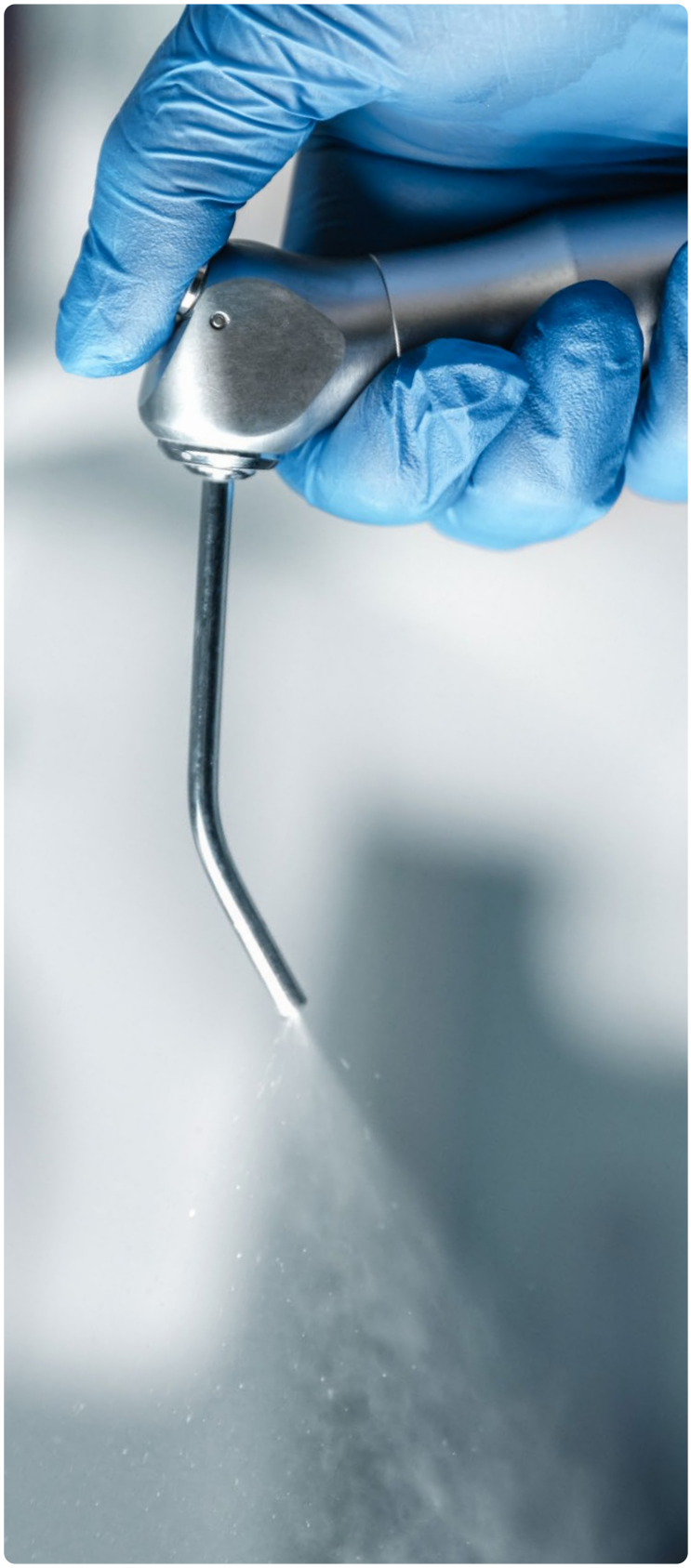
6 Strategies for Dental Unit Waterline Management (cont'd)

Strategy 5: Recognize Conditions that Might Cause High Levels of DUWL Microbial Contamination.[1,2,3,4,5,8,9,10]

1. Dental unit design problems.
   a. "Dead legs", or water tubing that dead ends so that water stagnates and does not flow out; biofilm grows and can contaminate connected lines.
   b. In-line filters, parts, or surfaces that trap biofilm and become a source of contamination if not changed or serviced.
   c. Dental units connected directly to the public water supply without access to treat the water.
   d. Retraction of patient material through handpiece or terminal attachment into waterlines.
2. Ineffective or unsafe germicidal waterline cleaning products.
3. Contaminated source water.
4. Poor staff compliance or technique: not maintaining water at safe levels with a consistent protocol. Examples are:
   a. Inconsistently or not adding DUWL germicides.
   b. Allowing cartridges or straws to expire before replacing them.
   c. Not flushing lines between patients.
   d. Introduction of pathogens to waterlines when manipulating tubing or equipment.
5. Not following the dental unit or DUWL germicidal product manufacturer's directions.
6. Heating dental water: warm water can increase microbial growth and biofilm formation.
7. Not testing waterlines.
8. Not shocking waterlines.



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6 Strategies for Dental Unit Waterline Management (cont'd)

Strategy 6: Create Your DUWL Standard Operating Procedures and Staff Training

DUWL treatment and testing are temporary: microbial levels will change rapidly. Constant management and assessment are required, with a written checklist or standard operating procedure.

The following chart may be modified for staff training and to create your written protocol.[1,2,5,8,9] The chart is segmented into four color-coded procedural areas for:

- **Getting Started**
- **Water Source Options** and **Waterline Flushing**
- **Chemical Treatments**
- **Testing Dental Unit Water and Recording Results**

DUWL Standard Operating Procedures and Training To Provide Potable Dental Unit Water [1,2,3,4,5,8,9,10] OSAP.org

	Reason (Why?)	Method (How?)
GETTING STARTED	**1.** Educate and train the safety team.	
	Dental Health Care Personnel (DHCP) are more likely to comply with an infection-control program if they understand its rationale.	Inform and train all DHCP about dental water safety, management and recordkeeping; including water quality, biofilm formation, water treatment methods, and appropriate maintenance AND MONITORING protocols for water delivery systems. Subscribe to publications from OSAP, CDC, State Dental Board and professional dental organizations to stay up-to-date about required water quality standards and risks of DUWL contamination.
	2. Use a dental unit waterline delivery system that is separate from the municipal (city) plumbing and/or provides access to treat waterlines.	
	Municipal (safe drinking) water contains microorganisms that multiply in DUWLs and may cause patient infections if the DUWL water is not treated.[8] Separate DUWL systems enable personnel access to the water to treat it.	Use self-contained dental unit water systems, separate from the building plumbing. Self-contained systems allow access to fillable reservoirs to add high-quality water and daily germicides. Or, install automated metered germicidal water treatment systems such as cartridges to introduce germicidal DUWL products.
CHEMICAL TREATMENTS	**3.** Initially and periodically "shock" to remove attached biofilm.	
	Aggressive chemical (shock) treatment is required to remove attached biofilm. Biofilm can be present in new equipment, after periods of non-use, and can build up over time during regular use.	Shock the waterlines: Follow both the equipment and the antimicrobial product manufacturer's recommendations for selecting and using shock products. Use products specifically developed and approved for removing biofilms in dental waterlines, and use as directed to avoid the risk of equipment damage from chemicals such as bleach. Shock initially, after periods of non-use, and periodically or when water testing indicates the need to reduce contamination.
	4. Ensure daily DUWL germicidal product is continuously present in dental water.	
	Continuous antimicrobial DUWL treatment is necessary to control microbial contamination and biofilm growth to ensure potable water. Unmaintained in-line filters may become a source of waterline contamination.	Add DUWL germicidal product every time water reservoir is filled. Change and empty bottles as directed. Replace and service cartridges (sometimes referred to as "straws") as directed by manufacturer. Use a commercial product designed and approved for use in dental waterlines as directed. Install, monitor, and service/replace any in-line filters or devices.

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DUWL Standard Operating Procedures and Training To Provide Potable Dental Unit Water [1,2,3,4,5,8,9,10]

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	Reason (Why?)	Method (How?)
WATER SOURCE OPTIONS I LINE FLUSIHING	**5.** Use high-quality source water for non-surgical procedures.	
	Contaminated source water may defeat daily DUWL germicides, resulting in unsafe microbial levels.	Follow both the equipment and the antimicrobial product manufacturer's recommendations for selecting source water. Use only fresh, clean water. Choices include: › Fresh municipal (faucet) water › Fresh distilled water › Fresh filtered water › Commercial drinking water
	6. Provide sterile water for surgical procedures.	
	Contaminated dental unit waterlines pose a risk of infection to the patient, particularly during surgical procedures by direct exposure to waterborne pathogens.[8] To meet the requirement for using a sterile irrigant or coolant for dental surgical procedures, and to avoid the risk of contaminating a surgical site, sterile water is necessary. Dental unit waterlines cannot be sterilized and therefore are not capable of delivering sterile water to the treatment site.	Use United States Pharmacopeia (USP) sterile water or saline. Deliver via a separate sterile delivery device, bypassing the dental unit delivery system. Sterilizable water delivery devices must have cleanable and sterilizable or single-use/disposable parts that contact the water. Examples of sterilizable water delivery devices are sterile syringes or a peristaltic pump with sterile tubing.
	7. Flush water for at least 20 seconds after each patient.	
	Dental handpieces and attachments may retract patient materials into the waterlines and may be passed to other patients. Flushing waterlines removes floating material but does not completely remove attached biofilm.	Remove attachments and run water from all lines used on the previous patient for 20-30 seconds. Do not confuse flushing with shocking.
TEST DENTAL UNIT WATER AND RECORD RESULTS	**8.** Test dental unit water.	
	Monitoring DUWL quality provides an important margin of safety for DHCPs and patients. DUWL testing is important to: › Determine water quality. › Validate the effectiveness of dental water treatment. › Record safe (potable) microbial levels. › Determine the need to shock, treat or replace waterlines. Testing must be repeated: biofilm grows rapidly.	When to test: › Periodically, and on a regular schedule, following the manufacturer's directions. › After performing shock treatments, wait recommended time to test water (usually 1 week). Using commercial dental waterline testing supplies, collect samples aseptically, and mail fresh samples to the laboratory as directed. Mail-in laboratory testing provides detailed information of microbial contamination, and records of testing. Using in-office dental waterline tests, follow the manufacturer's directions for sample collection and incubation, and interpretation of test results. In-office water testing provides a rough estimate of microbial contamination.
	9. Record waterline treatment and test results.	
	Waterlines should be regularly monitored. Test results should be documented in order to show proof of compliance with recommended water quality management, safe water levels and practices, and to identify needed action.	Keep a log.

See Dental Unit Waterline Training Resources on next page.

Dental Unit Waterline Training Resources

This osap.org webpage links to multiple references on dental unit waterlines
osap.org/topics-dental-unit-waterlines-duwl

CDC. Foundations: Building the Safest Dental Visit [Module 3: includes dental unit waterlines)
cdc.gov/oralhealth/infectioncontrol/foundations-building-the-safest-dental-visit.html

CDC: Basic Expectations for Safe Care [Module 9: Dental Unit Water Quality]
cdc.gov/oralhealth/infectioncontrol/safe-care-modules.htm

Webinar: Crashing the Biofilm Party: Understanding the Path to Safe Dental Unit Waterlines
osap.mclms.net/en/package/10332/view (Free 1 hour CE for OSAP members)

Webinar: Environment of Care and Water Safety
osap.mclms.net/en/package/9878/view (1 hour CE - $15 for OSAP members)

Webinar: Instructions for Use (IFUs)
osap.mclms.net/en/package/7814/view (1 hour CE - $15 for OSAP members)

Glossary of Terms

Airborne precautions: the second tier of basic infection control to be used in addition to Standard Precautions. It is used for patients who may be infected or colonized with certain infectious agents for which additional precautions are needed to prevent infection transmission by the airborne route (e.g., tuberculosis, measles chickenpox, disseminated herpes zoster, SARS-CoV-2).

Biofilm: mass of microorganisms within a protective matrix secreted by the organisms.

Colony-forming units (CFU): individual organisms or groups of bacteria that form one colony on a test medium such as agar; each is counted as "one" CFU per milliliter of water.

Dental Unit Water: water that flows through dental tubing for irrigation and cooling during dental treatment.

Germicide: substance or agent that destroys harmful microorganisms. The term germicide includes both antiseptics and disinfectants.

Shocking the waterlines: the periodic process of using a strong disinfectant to purge attached biofilm and bacteria that has built up over time in the dental unit waterlines.

Standard Operating Procedure (SOP): written step-by-step protocol.

Total Dissolved Solids (TDS): inorganic salts and small amounts of dissolved organic matter. Filters that remove total dissolved solids do not remove microorganisms.

USP sterile water: water that meets United States Pharmacopeia specifications as "sterile".

USP saline: water that meets United States Pharmacopeia specifications as "sterile" water with salt.

TEAM HUDDLE DISCUSSION GUIDE

1. What is the DUWL management protocol for your office?
2. Who is responsible for DUWL daily treatment, testing, and shocking?
3. Is your written protocol correct, complete, and updated?
4. Does everyone understand the potential risks related to DUWL contamination?
5. How will you answer patients' questions about your dental water safety?

Links to Resources

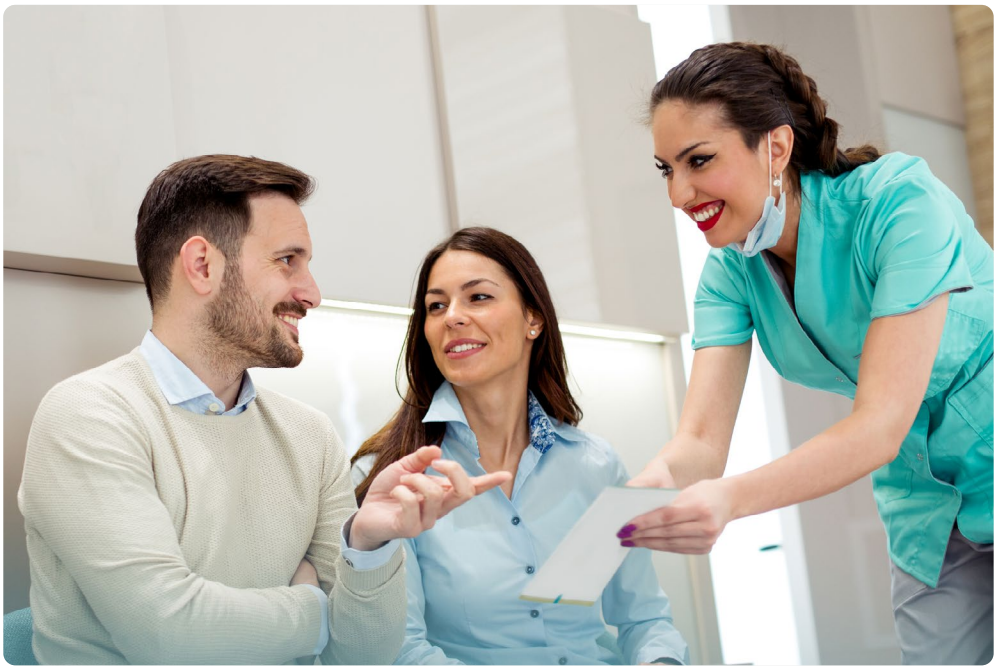
1. CDC Health Advisory, Health Alert Network (HAN): Outbreaks of Nontuberculous *Mycobacteria* Infections Highlight Importance of Maintaining and Monitoring Dental Waterlines, October 31, 2022. **emergency.cdc.gov/han/2022/han00478.asp** Accessed June, 2023
2. CDC. Guidelines for Infection Control in Dental Health-Care Settings - 2003. MMWR 2003:52(No.RR-17) **cdc.gov/mmwr/PDF/rr/rr5217.pdf** Accessed June, 2023
3. Mills, S. et al: Dental Unit Water Quality: Organization for Safety, Asepsis and Prevention White Paper and Recommendations-2018. Journal of Dental Infection Control and Safety. **osap.org/assets/docs/resources/toolkits-topics/dental-unit-water-quality-organization-for-safety-asepsis-and-prevention-white-paper-and-recommendations-2018.pdf** Accessed June, 2023
4. Molinari J.A., Harte, J.A., Cottone's Practical Infection Control In Dentistry, 3rd. Ed. pg. 63-75. Lippincott, 2010
5. Miller, C., Infection Control and Management of Hazardous Materials for The Dental Team, 7th Ed., pg. 160-169. Elsevier, 2018
6. Williams, J., Molinari J.A., Andrews, N. Microbial Contamination of Dental Unit Waterlines: Origins and Characteristics. Compendium, June 1996 Vol. 17, No. 6
7. Mills SE. Waterborne Pathogens and Dental Waterlines. Dent Clin North Am. 47(3):545, 2003
8. FDA. Dental Unit Waterlines. **fda.gov/medical-devices/dental-devices/dental-unit-waterlines** Accessed June, 2023
9. Dewhirst, N., Molinari, J.A., Treating and Monitoring Dental Unit Water. Current Topics in Infection Control. Compendium, May 2018. **cced.cdeworld.com/courses/22748-treating-and-monitoring-dental-water** (expires March 31, 2026) Accessed June, 2023
10. CDC. Dental Water Quality FAQs **cdc.gov/oralhealth/infectioncontrol/faqs/dental-unit-water-quality.html** Accessed June, 2023

KEY TAKEAWAYS

1. Dental water can become contaminated with organisms including bacteria, protozoa, and fungi that pose risks of infection to workers and patients.
2. Dental water pathogens are transmitted by inhalation, ingestion, and mucosal and open tissue absorption.
3. Adherent biofilms inside DUWLs that protect and shed microorganisms grow rapidly and must constantly be managed to maintain potable dental water.
4. Dental water should be flushed between patients to reduce the risk of cross-contamination with possible retracted material from the previous patient.
5. Dental water must be tested to confirm successful waterline management, verify safe water levels, and determine the need to shock.
6. Treating DUWLs does not sterilize the output water but can reduce biofilm and microbial levels to provide potable water temporarily.
7. Accumulated adherent DUWL biofilm requires shock treatment to be removed.
8. Surgical procedures must be performed with sterile water or saline using alternative sterile delivery devices or equipment instead of DUWLs.
9. Create a written checklist or SOP to guide and record dental water management practices.
10. Calibrate the safety team by updating their knowledge of DUWL risks and requirements.

What's Wrong With This Picture?

Can you identify the breach of infection prevention and control in this image of a dental assistant greeting patients in the dental office reception area?



Answer: The dental assistant is wearing a presumably contaminated face mask pulled down under the chin. All personal protective equipment should be removed upon leaving the dental treatment area and not worn in patient reception areas. It is hoped the dental assistant performed hand hygiene prior to greeting the patients in the reception area, as the assistant's hands were contaminated when positioning the soiled face mask under the chin.

Take the Silent Video Challenge!

The Scenario: Flushing handpiece waterline

In this video scenario following patient treatment, what steps are missing in the process of flushing the dental handpiece waterline?

https://youtu.be/G3bmK2By7Vk

Challenge your knowledge and compare to the lesson below.

The Lesson: The short process for flushing the dental handpiece waterline is compromised. After patient treatment, detach any dental burs or cutting instruments from the handpiece. Detach any removable handpiece from the input coupling/connector. Flush water through the dental tubing waterline for 20-30 seconds. Note: dental handpieces and attachments may retract patient materials into the waterlines, and these materials may be passed on to other patients. Flushing the lines removes floating material but does not entirely remove any attached biofilm.

Thanks

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OSAP thanks the following companies that help to underwrite each issue of this special series of *Infection Control in Practice*: Team Huddle™ in 2023.

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Educational Spotlight

Dental Infection Control Awareness Month (DICAM)

Join us in promoting dental safety throughout September during Dental Infection Control Awareness Month **#DICAM23**!
OSAP's theme this year is "**Staying in The Know Together**".

OSAP is committed to providing the dental community with resources to enrich awareness and knowledge of dental infection control and safety, to make every dental visit The Safest Dental Visit.

Tap into engaging resources to use and share at osap.org/dicam and customize a 3-part action plan for your dental team, patients and the general public.

1. Prioritize and refresh staff education and training with a weekly focus.

Each week OSAP #DICAM23 will focus on a different infection control topic:

- Hand Hygiene (September 4 – 8)
- Dental Unit Waterlines (September 11 –15)
- Instrument Reprocessing (September 18 –22)
- Personal Protective Equipment (September 25 – 29)

2. Build patient trust and confidence. Communicate.

- Converse with patients about your office's commitment to their safety.
- Learn how at **osap.org/dicam**

3. Increase public awareness of dental infection control measures.

- Share knowledge in social media, websites, posters, and in-office activities.
- #DICAM23 Social Media Toolkit **available now**!

We can learn from each other and spread the knowledge faster, together.
Stay In The Know Together and share the hashtag: **#DICAM23**.

Questions? We are here to help!
Email: office@osap.org
Phone: +1(410) 571-0003 | US & Canada: +1(800) 298-6727

GET YOUR CE CREDIT ONLINE

Follow the instructions below to receive 1 hour of CE credit FREE to OSAP members. OSAP is an ADA CERP Recognized Provider.*

Step 1: Go to **osap.mclms.net/en/package/11948/view** to register or purchase the course.

Step 2: Log in to your OSAP member account or create a new user account.

Step 3: Complete the registration form. OSAP members FREE! Non-members $20.

Step 4: Complete the online course. You must pass with 7 out of 10 correct answers. When completed, you will receive an email with your CE certificate. The CE certificate will also be available in your new OSAP Infection Prevention & Safety CE Center account under MY ACCOUNT > MY CERTIFICATES.

QUESTIONS TO ONLINE QUIZ:
Select the most correct answer

1. Identify the TRUE statement about biofilm in DUWLs.
   a. Biofilm organisms are primarily solitary and free-floating.
   b. Biofilm formation is slow and requires high protein content in the water.
   c. Biofilm forms quickly, possibly reaching non-potable levels in 5 days.
   d. Biofilms only form in unused DUWLs.

2. Identify the TRUE statement about dental water standards for surgical procedures.
   a. Surgical procedures should be performed using USP sterile water delivered through the DUWLs.
   b. Surgical procedures should be performed using USP sterile water or saline delivered through a sterile device.
   c. Surgical procedures should be performed using distilled water delivered through a sterile device.
   d. Surgical procedures should be performed using distilled water delivered through DUWLs.

3. Identify the condition that is caused by *Legionella*.
   a. Oral abscesses.
   b. Gastroenteritis.
   c. Liver damage.
   d. Pneumonia.

4. The following are ways dental water biofilm pathogens commonly enter the body except one. Identify the one INCORRECT answer.
   a. Epidermal contact.
   b. Inhalation.
   c. Ingestion.
   d. Mucosal and open tissue absorption.

5. Identify the correct maximum level of bacteria that meets the potable water standard.
   a. 200 CFU/mL
   b. 400 CFU/mL
   c. 500 CFU/mL
   d. 700 CFU/mL

6. Identify the key feature of a dental unit waterline system that provides for the best DUWL biofilm management.
   a. Plumbing that allows access to the waterlines outside the building.
   b. Closed systems, connected to the city plumbing.
   c. Cleanable suction system.
   d. Plumbing that allows access to the waterlines to fill and/or treat the water at the dental unit or inside the office.

7. All of the following are reasonable methods of managing dental water quality except one. Identify the INCORRECT answer.
   a. Rely on monthly shock treatments to avoid adding daily germicides
   b. Follow manufacturer's directions for selecting source water.
   c. Continuously add a low-level germicide to dental treatment water, specifically approved for use in dental waterlines.
   d. Test dental water periodically: monthly or quarterly.

8. Identify the TRUE statement below related to dental source-water.
   a. Fresh distilled water is equal to sterile water.
   b. Commercial drinking (bottled) water has no expiration date.
   c. In-office distilled or filtered water, may be stored and used for up to 3 years without concern for microbial growth.
   d. Filters that remove total dissolved solids do not remove microorganisms.

9. Identify the one answer below that is recommended to maintain DUWL safety and quality.
   a. Add the DUWL germicide product every second or third time the water is changed.
   b. Test dental water monthly or quarterly, after equipment is installed or repaired, to determine the need to shock, or follow the manufacturer's directions.
   c. Test dental water when an unpleasant odor or taste is noticed.
   d. Test dental water immediately after shocking.

10. Identify the role the biofilm plays in dental water contamination.
    a. Biofilm hides microbes, protecting the dental water.
    b. Biofilm is natural in drinking water and is necessary for taste.
    c. Biofilm sheds microorganisms, contaminating dental water.
    d. Biofilm plays a neutral role and is not important.

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FROM THE Editor's Desk

Updated CDC Guidance on Building Ventilation

CDC Guidance for improving building ventilation was updated on May 11, 2023, providing more specific directions and air quality correction goals. **cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/Improving-Ventilation-in-buildings.html#print**

This update is not specific to healthcare or dentistry but provides minimum standards for buildings in general: future dental ventilation standards are likely to exceed public standards. Dental respiratory safety requires multiple mitigation strategies, including optimal ventilation to protect against respiratory infections.

The update provides new guidance on the following topics:

1. Target 5 air changes per hour (ACH) of clean air in occupied spaces.
2. Upgrade to Minimum Efficiency Reporting Value (MERV) 13 filtration in heating ventilation and air conditioning (HVAC).
3. If the equipment will not tolerate MERV 13 filters, supplement with high-efficiency particulate absorbing (HEPA) filter units.
4. Post-occupancy flushing of building air.
5. Up-front maintenance and energy cost considerations for ventilation strategies.
6. Whole-Room Ultraviolet Germicidal irradiation.
7. The EPA Clean Air in Building Challenge. **epa.gov/indoor-air-quality-iaq/clean-air-buildings-challenge**

Learn more from the CDC guidance: "**Ventilation in Buildings**".

Looking Ahead:

OSAP Dental Infection Control Boot Camp 2024!

Mark you calendar and share the dates and location with your dental team.

February 5 – 7, 2024

Crowne Plaza Atlanta Perimeter at Ravinia
4355 Ashford Dunwoody Road
Atlanta, GA 30346.

Registration for the 2024 Boot Camp will open in Fall 2023.

OSAP-DALE Foundation Dental Infection Prevention and Control Certificate™

A comprehensive online educational program for anyone who wants to learn more about dental infection prevention and control. Earning the certificate demonstrates an in-depth understanding of CDC guidelines and OSHA standards related to standard precautions.

1. Complete the OSAP-DALE Foundation online CDEA® module **Understanding CDC's Summary of Infection Prevention Practices in Dental Settings** ($30)
2. Complete the **OSAP-DALE Foundation Dental Infection Prevention and Control eHandbook™** ($195)

Bundle Price $215* **Get the Bundle!**

*Discounts are available for the purchase of multiple courses and groups of learners.

Those who successfully complete the program receive a certificate of completion and a digital badge that can be shared on social media, emailed to friends or colleagues, or downloaded.

dentalinfectioncontrol.org/education

For certification opportunities see page 17, Set Yourself Apart.

OSAP is on the MOVE in 2023

Stop by to see us at these conferences in 2023. We look forward to meeting you!

Thanks to all who came by the OSAP booth to say Hi at RDH Under One Roof in Nashville, TN.

If you will be attending the following conferences this year, we look forward to meeting you.

- **AADOM Annual Conference**
  Loews Sapphire Falls Resort
  Universal Studios, Orlando, FL
- **NNOHA Annual Conference**
  Sheraton Denver Downtown Hotel
  Denver, CO

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Developed by OSAP and the DALE Foundation

Certification

Dental Industry Specialist in Infection Prevention and Control® (DISIPC®)

Intended for those who play important roles in dental infection prevention and control, such as practice managers, sales representatives, customer service personnel, and service technicians who do not provide clinical care. Earning DISIPC demonstrates knowledge related to infection control guidelines and standards.

Developed by OSAP and DANB

Certified in Dental Infection Prevention and Control® (CDIPC®)

Intended for the dental team, educators, consultants, and others with a clinical background. Earning CDIPC certification demonstrates an advanced level of infection control guidelines and standards knowledge and the analytical and critical-thinking skills to apply them in various scenarios.

Developed by OSAP and DANB

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