

Postpandemic infection control: Is your team following best practices?

While infection control took front and center stage during and after the pandemic, it had always been and continues to be a huge part of daily operations in dental practices. Taking proper IC steps and wearing the right personal protective equipment keeps everyone safe and gives your patients peace of mind. *RDH* authors want to make sure everyone stays safe and healthy, and that the whole team is correctly and consistently following IC guidelines. Arm yourself with this knowledge about best infection control practices, and you'll feel confident every day.

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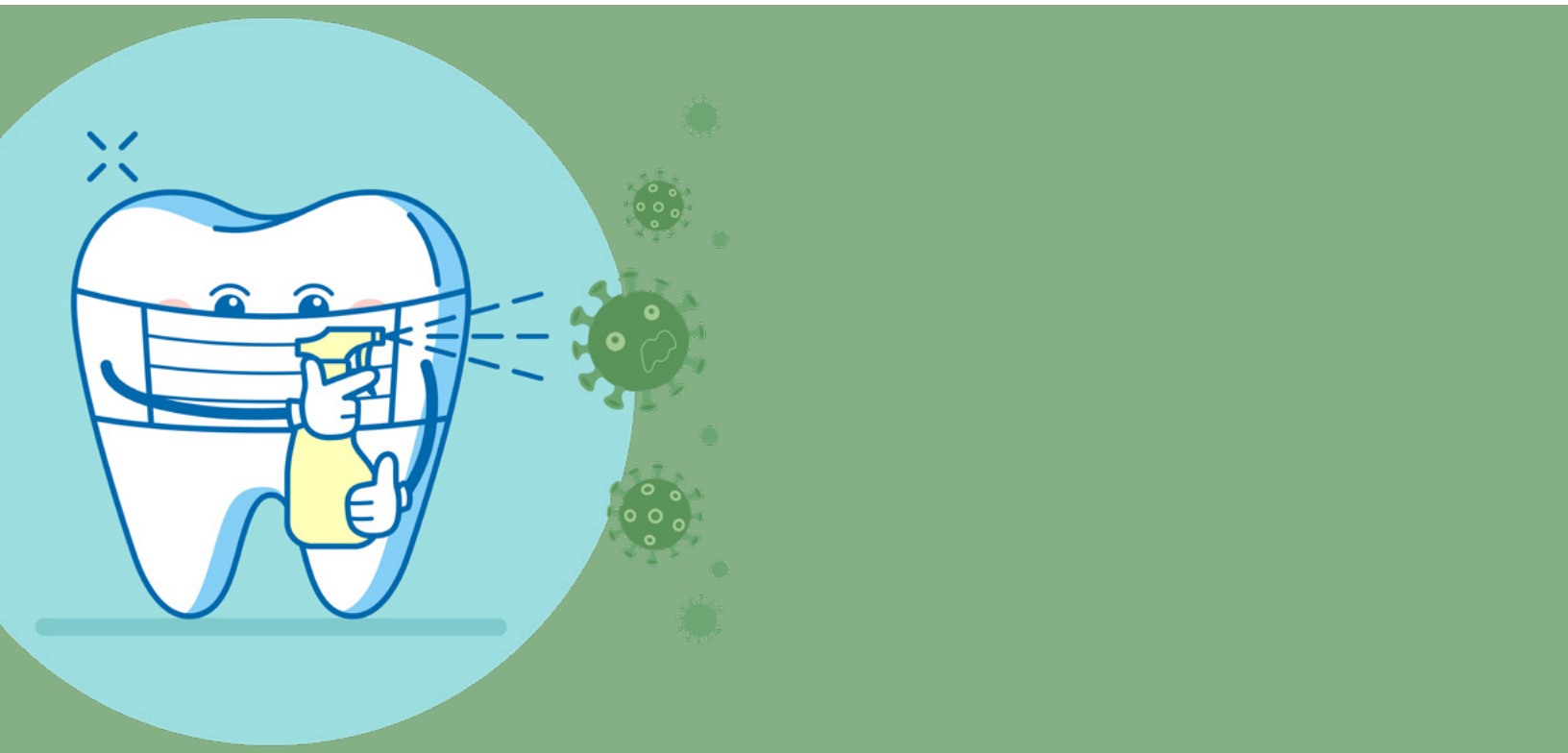
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10 INFECTION CONTROL TRENDS TO WATCH FOR

While the primary goal of infection control is to keep everyone safe and healthy, there are trends in the area that can make proper IC more effective and easier. What are they, and how can your office stay in the know about the latest trends?

BY AMANDA HILL, BSDH, RDH, CDIPC

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Dentistry is constantly evolving. There's new science, new products, and certainly new trends. Infection prevention and control are not immune from this evolution. Every year, infection control minds meet at the Association for Dental Safety (ADS) annual conference to discuss the issues and

research surrounding dental safety. The group met in Tucson in 2024. Here are 10 of the latest trends to keep an eye on.

SAFETY CULTURE

In 2012, the Joint Commission introduced the importance of a culture of safety in

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health-care facilities. A safety culture “describes a commitment to core values and principles by organizational leadership and health-care workers to recognize the inseparable integration of worker safety and patient safety.”¹ When an organization commits to this principle, there are better patient outcomes, improved quality of care, reduced costs, and fewer injuries.

The keys to a strong safety culture hinge on teamwork and leadership support. Standard operating procedures (SOPs) must be established and communicated so that all team members understand and successfully implement them. Errors need to be responded to nonpunitively. Instead of quickly seeking someone to blame, the system should be evaluated and viewed as an opportunity to learn and improve. Workers are far more likely to adhere to standard precautions when they feel there’s a strong commitment to safety.

ANTIBIOTIC STEWARDSHIP

The CDC issued “Antibiotic Resistance Threats in The United States” in 2019, which includes national death and infection estimates for 18 antimicrobial-resistant bacteria and fungi. This report stated more than 2.8 million antimicrobial-resistant infections occur in the US each year, and more than 35,000 people die as a result. When *C. diff* is added to these, the US toll of all the threats in the report exceeds three million infections and 48,000 deaths.²

Dentistry prescribes nearly 10% of out-patient antibiotics,³ and it’s estimated that 80% of those prescriptions are not within the guidelines for proper prescribing. It’s time for dentistry to reevaluate their prescribing

practices. New data suggests that treating all oral infections with antibiotics is unnecessary and that definitive treatment is the best way to treat an infection. The majority of patients with joint replacement do not require antibiotic prophylaxis. Due to the risk of *C. diff*, clindamycin is no longer recommended. Lastly, patients with a reported penicillin allergy should be assessed for potential delabeling. Refer to organizations such as the American Dental Association and the Michigan Antibiotic Resistance Reduction Coalition for up-to-date research and information.⁴

GO GREEN

There’s a growing trend in dentistry to evaluate one’s carbon footprint and its effect on the environment. New products and packaging are emerging to address these concerns. Companies are establishing sustainability initiatives. Some clinicians are seeking products that reduce single-use disposables in favor of reusable products or a more biodegradable version. However, they must still be cost-effective, have verified sterilization instructions, and be easy to implement.

Important considerations when choosing any product is that it still must meet the requirements established by federal, state, and local authorities. For instance, if a surface disinfectant claims to be “green,” it must be registered with the EPA and appear on List B for a TB claim and List S for a bloodborne pathogens claim.

VENTILATION

The COVID-19 pandemic alerted dentistry to the aerosols produced in the operator. Many looked to the American Society of Heating,

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Refrigerating, and Air-Conditioning Engineers (ASHRAE) for help implementing engineering controls to address airflow and ventilation to ensure safety for patients and clinicians. Since nano-sized particle viruses can stay airborne for up to 40 hours,⁵ airflow and filtration should be evaluated to determine the air exchange rate.

Recommendations for airflow and ventilation include running an air purifier during working hours and up to two hours at the end of the day, switching the HVAC thermostat from “auto” to “on” when the office is occupied, using a HEPA filter if the HVAC can support it, and conducting a risk assessment with an HVAC professional.⁶

DEVICE LABELING

The Food and Drug Administration (FDA) regulates medical devices such as sterilizers, dental chairs, and x-ray equipment. On August 22, 2024, the FDA issued its final guidance on using the electronic submission template (eSTAR)⁷ to submit new requests for medical devices. While this mainly affects manufacturers, this new transmission system helps ensure that submitters provide quality, comprehensive data for premarket review. The standardized format allows products to be reviewed more efficiently to bring safe, effective, high-quality medical devices to market.

The FDA also encourages health professionals to use its MedWatch platform to report product safety issues or discrepancies in instructions for use (IFUs).⁸ In today’s global market, it’s easy to find products that might not have passed through the FDA. It’s important to look for validated IFUs, but if using older equipment, look for IFUs that have been

updated with today’s infection control standards, or stop using the device.

MOBILE DENTISTRY

Bringing dentistry to those in need is a growing trend to address access-to-care issues. Whether it’s an office on wheels or setting up a clinic in a multiuse space, mobile dentistry brings infection control challenges that brick-and-mortar offices don’t face. Finding a private space with adequate airflow, running water, and space for instrument decontamination can be challenging. If instruments are not sterilized on-site, they must be transported in a closed, locked container with a pretreatment gel or spray to prevent the bioburden from drying on the instruments. If possible, remove debris with a wet 2X2 immediately after use to avoid the need to scrub instruments before processing. Equipment maintenance, while always important, is especially crucial if equipment sits unused for a period of time.

RADIATION SAFETY

As x-ray technology advances, the requirements around inspection and shielding are changing. Shielding patients with lead aprons is often no longer recommended. However, in many states, providers must wear a lead apron when using a portable x-ray device. It’s important to check with your state and local authorities.

STAFF SAFETY

While more of an OSHA requirement than infection prevention, active shooter and inclement weather training is becoming a requirement and offices should have a plan for either scenario.⁹ Drills establishing a safe place to

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shelter in the unlikely event of a tornado or a plan for who will call the authorities in the case of a hostile patient should be performed.

DENTAL UNIT WATERLINES

While this one might not be new, it's still new to many clinicians, and cases of patients affected by contaminated dental unit waterlines continue to grow. New tests and treatment products are being introduced to the market. Practices must have a waterline protocol in place that involves at minimum quarterly testing to determine that their procedural water meets the EPA standard of <500 cfu/ml.

DOCUMENTATION

We all know that if we don't write it down, it didn't happen. This is true when it comes to infection control protocols and maintenance. Emerging technology can help with the required documentation, from sterilizers that record time, temperature, and pressure on each load to dashboards to keep all the maintenance straight and accountable. This technology is a welcome trend as the to-dos around infection control increase and staffing is stretched thin.

Staying current on recommendations and guidelines in dental infection control and prevention is critical for patient and team safety. ADS does an excellent job of sifting through all the organizations that have a role in safety and bringing the most current information to dental professionals, ensuring that "every dental visit is a safe dental visit."

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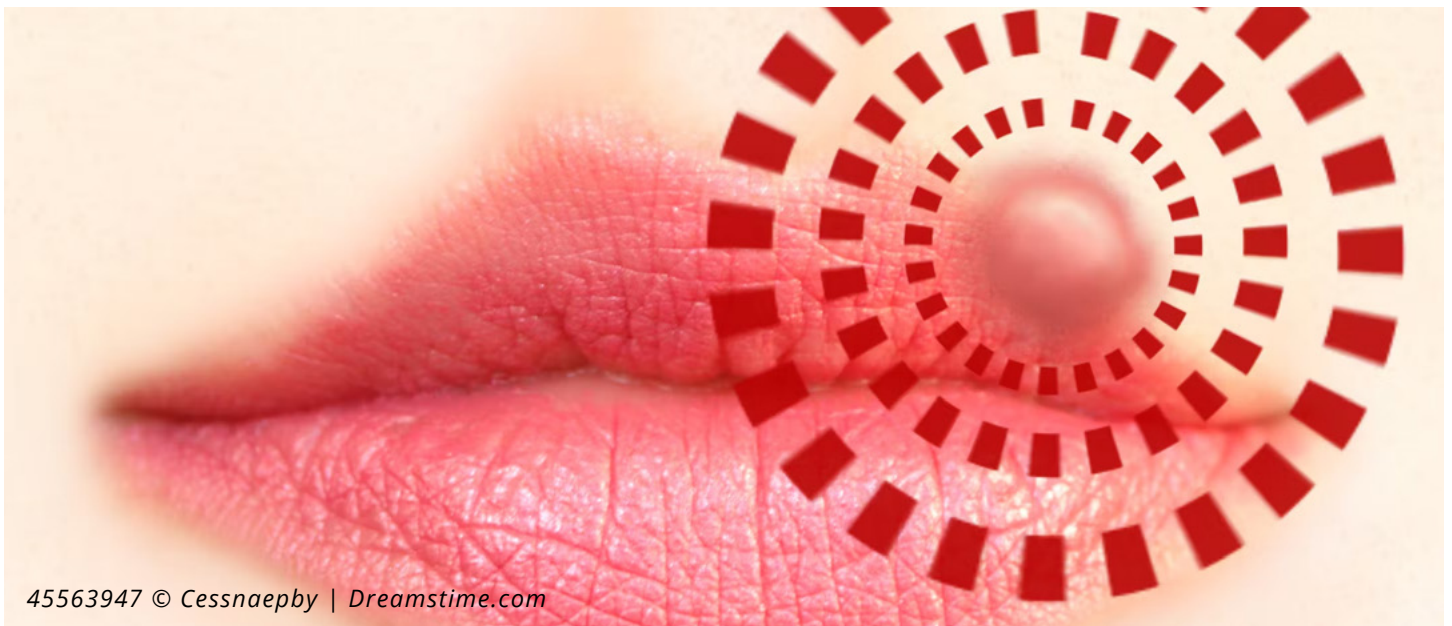
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RISKY BUSINESS: MANAGING PATIENTS WITH ACTIVE HERPES LABIALIS IN THE DENTAL SETTING

Treat patients with cold sores? This presents a unique situation and balancing act for dental hygienists. Here's information that can help you handle patients with active cold sores. Here's how to make the most of this year's remarkable opportunities.

BY [ANDREINA SUCRE, MSc, RDH](#)



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Encountering patients with active cold sores presents unique challenges for dental professionals. While the primary concern is preventing transmission, additional factors like patient safety, legal implications, and ethical considerations must also be carefully navigated.

TRANSMISSION ROUTES AND PATIENT RISKS

Herpes simplex type 1 (HSV-1), the virus responsible for cold sores, is highly contagious. Transmission can occur directly with infected lesions, contaminated instruments, or airborne droplets from sneezing or coughing.¹ Dental procedures involving close contact with

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the oral cavity and potential exposure to saliva heighten the risk of transmission to patients and dental professionals.

If a patient acquires HSV-1 during their dental appointment, the consequences can vary; for example, those experiencing a primary infection can experience a more severe initial infection with fever, malaise, and widespread oral lesions. For those with existing HSV-1, exposure can trigger another outbreak, potentially exacerbating existing oral health concerns. Moreover, HSV-1 infections can lead to severe complications in people with weakened immune systems.

ETHICAL DILEMMAS AND LEGAL CONSIDERATIONS

Seeing patients with active cold sores involves ethical and legal complexities. While the American Academy of Oral Medicine recommends delaying care for infection control, it emphasizes balancing a patient’s dental needs with transmission risks. If deemed necessary, managing patients with active herpes labialis lesions requires stringent safety measures² requiring these careful considerations.

- Reschedule nonurgent appointments: Postpone elective procedures until the lesions heal completely.
- Open communication: Explain the transmission risks to the patient and seek informed consent.
- Enhanced infection control: Implement meticulous hand hygiene, wear appropriate PPE like masks and gloves, and thoroughly disinfect instruments and surfaces.
- Minimize aerosol-generating procedures: Avoid ultrasonic scaling or high-speed

drilling that could aerosolize the virus.

- Consider antiviral therapy: In some instances, short-term antiviral medication for the patient might be warranted to reduce viral shedding.

WHAT IF IT’S NOT THE PATIENT, BUT ONE OF US?

Dental professionals with active cold sores are generally advised to avoid treating patients, especially for nonemergency procedures.^{3,4} The Occupational Safety and Health Administration (OSHA) guidelines and published literature highlight the importance of minimizing transmission risk, ensuring patient comfort and safety while allowing the professional to focus on recovery.

As Harrel and Molinari suggest, practitioners should assume that all patients have infectious diseases potentially spread by aerosol.⁵ This concept should be included in the profession’s understanding of universal precautions. While PPE eliminates much of the danger from spatter or large particles, aerosols still have the potential to be inhaled via leaks in the mask and to travel around safety glasses. They suggest a layered approach to protection, including high-volume evacuators—which can capture up to 95% of aerosols—safety glasses with side shields, and goggles.

WHEN ALL OUR SAFETY MEASURES FAIL: HERPETIC WHITLOW

Compared to other professions, dental professionals are at higher risk for developing herpetic whitlow, an HSV-1 infection characterized by painful, swollen fingers with blisters and a tingling or

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burning sensation. We should prevent infection by following strict hygiene, using PPE, avoiding contact with active cold sore lesions (if possible), and wearing gloves while performing dental procedures.⁵⁻⁷

Active herpes labialis in a dental setting signifies a delicate balance between patient needs and risk mitigation. We must be well-versed in the potential transmission risks, understand the ethical and legal implications, and implement meticulous infection control practices to ensure our and our patients' safety. Open communication, informed consent, and a patient-centered approach remain crucial in navigating this delicate situation effectively.

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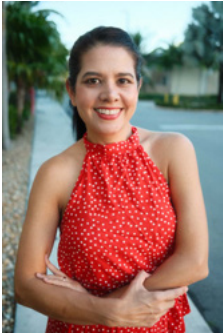
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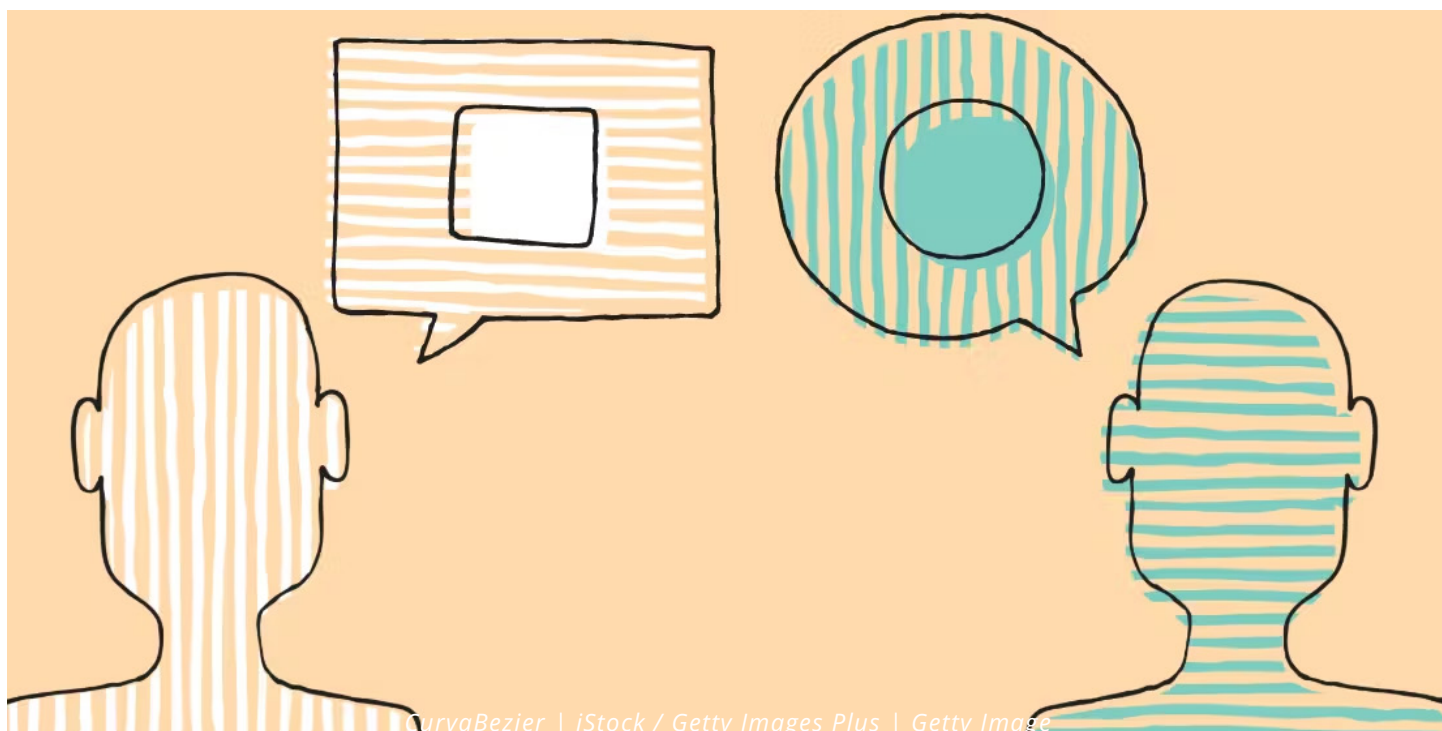
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PAPER UP OR PAPER DOWN? CLARIFYING INSTRUMENT REPROCESSING STANDARDS

Details, details. Does the autoclave paper go up or down? Amanda Hill answers this question and more as she shares some evidence-based SOPs for instrument sterilization that you can implement in your practice.

BY [AMANDA HILL, BSDH, RDH, CDIPC](#)



We recently hired a new dental assistant who is questioning how we sterilize instruments. We had a team meeting about it, and no one agreed on how we should do it. We can't even agree on whether our pouches should go in the autoclave paper up or paper down. Please clarify what is right.

Oh, the great debate—paper up or paper down? An excellent resource to help calibrate your standard operating procedures (SOP) is the Centers for Disease Control (CDC) Summary of Infection Prevention Practices in Dental Settings Basic Expectations for Safe Care.¹ This document provides an easy

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checklist to ensure you follow the basic infection prevention recommendations. Equally important are the instructions for use (IFU) of all your equipment, instruments, and devices.

When sterilizing patient care items and devices, you need to have everyone on the same page. And if you're like most offices, reprocessing instruments is a team effort. I love that you had a team meeting to try to figure out what to do. Now, let's get the facts so you can create some evidence-based SOPs.

CLASSIFICATION

You first need to understand what items require sterilization. Patient care items are categorized depending on their potential risk for disease transmission. Critical items penetrate soft tissue (e.g., scalers), semicritical touch mucous membranes (e.g., hygiene handpieces), and noncritical only contact skin (e.g., blood pressure cuff). Both critical and semicritical items should be heat sterilized. If they are not heat tolerant, such x-ray sensors, they should be covered with an FDA-approved barrier and disinfected after removal according to the instructions for use. And it should go without saying that all single-use items are just that, single-use, and put in the trash after use.

CLEAN AND DECONTAMINATE

Once you figure out what needs to be reprocessed, don the proper PPE. This includes puncture and chemical-resistant utility gloves, eye protection, and a long-sleeved fluid-resistant gown to protect you from splashes and sticks.

All the bio-burden must be removed from the instruments before sterilization. If the instruments can't be cleaned immediately,

consider a pre-enzymatic spray or soak to prevent debris from sticking to the instruments. Then, use an FDA-approved ultrasonic cleaner, instrument washer, or washer disinfectant to remove debris and decrease opportunities for an instrument stick. If debris remains, use proper PPE and scrub with a long-handled brush. Rinse the instruments and allow them to dry before packaging.

PACKAGE PROPERLY

Before packaging, ensure instruments are dry. Water droplets impede sterilization and can compromise packaging. Open up all hinged instruments and be sure not to overstuff bags.

Unless an instrument is going to be used immediately, all instruments must be packaged so they remain sterile. Most bags come with both an internal and external indicator. If the indicator isn't visible from the outside, such as when using sterilization wrap, place a chemical indicator inside the cassette and use tape with an indicator on the outside.

Packages should be labeled on the folds of the bags or the sterilization tape so as not to affect the package. Label them with the sterilizer used (if more than one), cycle load number, and date. This way, you can recall the affected instruments if there is a sterilization failure.

PAPER UP OR PAPER DOWN?

The paper up/paper down debate is settled here: Pouch orientation can be different in different sterilizers. Paper up, paper down, and even pouches stacked sideways are all options you may find in your IFUs, so you have to read them. When loading the sterilizer, be sure not to overlap the packages to leave room for the

air/steam to penetrate all the packaging. When the load is finished, let the instruments cool and dry before unloading—no playing hot potato with packages. Wet packs are not considered sterile because excessive moisture can act as a pathway for microorganisms and should be repackaged and resterilized.

Biological indicators (e.g., spore tests) must be used at least weekly to ensure the sterilizer works properly. Those can be done in-office or mailed in. Be sure to keep records that comply with your state and local regulations.

STORAGE

Prior to storing sterilized instruments, check to see if the external and internal (if visible) indicators have changed color and that the packages haven't been compromised with instruments poking through. Store in closed cabinets or drawers to prevent contamination.

ROUTINE MAINTENANCE

Last, pull back out those IFUs for your sterilizer and read the daily, weekly, and monthly

maintenance. Performing the recommended maintenance will decrease the chances of having a sterilizer emergency and elongate the life of your machine.

Good luck at your next team meeting, and I hope you all get on the same page when it comes to instrument sterilization.

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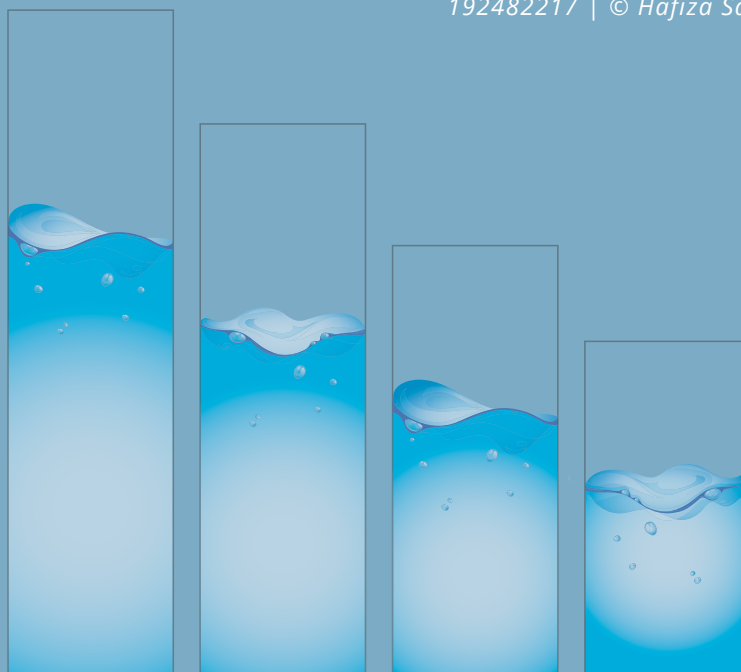


DENTAL UNIT WATERLINE SAFETY: WHAT IS (AND ISN'T) GOING WELL

Dental unit waterlines are a perfect environment for bacterial growth and have to be properly maintained for safety. But a new survey reveals that isn't happening, for a lot of reasons.

BY [AMELIA WILLIAMSON DESTEFANO, MA](#)

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Waterline treatment and testing is a vital pillar of infection control in dentistry, and yet it still remains a huge point of confusion—even apathy—for many clinicians.

On October 31, 2022, the Centers for Disease Control and Prevention's Division of Oral Health issued a Health Alert Network (HAN) Health Advisory, a very unusual event.

The report was triggered by a March 2022 outbreak of nontuberculous *Mycobacteria* at an unidentified pediatric office; outbreaks also occurred in 2015 and 2016.

There are four levels of Health Alert Network messages, and a Health Advisory is the second most urgent. The CDC states that Health Advisories "require immediate action"

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and “provide important information about a public health event.”¹

While the CDC did not state specifically what procedures were involved in the 2022 outbreak, the children harmed in the 2015 and 2016 outbreaks had all undergone pulpotomies.

Writing about the alert at the time, [Amanda Hill, BSDH, RDH](#), said, “This makes the third such cluster of infections since 2015 where multiple children have been affected. And when I say affected, I don’t mean these kids had to take an antibiotic for 10 days and all was well. These patients have had multiple surgeries and lost permanent teeth and parts of their jaw. Many are permanently disfigured and/or disabled because of these infections.”²

There is clearly still confusion about how to test, treat, and maintain dental unit waterlines properly.

IF IT’S IN YOUR WATERLINES, IT’S IN YOUR AIR

Known disease outbreaks from dental unit waterlines are rare, but the consequences can clearly be severe and life-altering. Another aspect worth considering: while aerosols have been a known problem in dentistry for decades, the coronavirus pandemic brought a new level of concern about what clinicians are breathing all day. While concern about respiratory virus transmission in dental aerosols turned out to be overblown,³ aerosols from waterlines continue to be a concern. If it’s in your waterlines, you’re breathing it.

CURRENT TRENDS IN WATERLINE MAINTENANCE

To get a better idea of how waterline maintenance and safety is going for our audience, we conducted a short survey of dental professionals in September and October. There was a total of 186 respondents. While there were many encouraging signs in the results, some of the data shows that dentistry still has a ways to go.

THE FULL REPORT, INCLUDING GRAPHS, IS AVAILABLE TO DOWNLOAD AT THE END OF THE ARTICLE

Seventy-seven percent of our respondents were dental hygienists, 13% were dentists, with the other 10% distributed in other roles such as assistants, office managers, and educators. About half strongly agreed that their office was following accepted industry recommendations to maintain waterlines, and 83% overall strongly agreed that waterline maintenance is important to patient and provider safety.

Our survey also included a question asking respondents how many disease outbreaks had been caused by dental water in the United States. Interestingly, dental professionals tended to either underestimate or overestimate this. 41% responded that there had been no outbreaks, while 35% selected 5 or more. (The correct answer was 3.)

“I wish there was an organization that checks waterlines and OSHA standards of private practices. Most times when I try to bring up such standards, it gets dismissed.”

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COMPARING DENTAL HYGIENISTS AND DENTISTS

When asked to rate their agreement with the statement “maintaining dental unit waterlines is important to patient and provider safety,” hygienists were more likely than dentists to strongly agree. Eighty-eight percent of hygienists “strongly agreed” that it was important, while only 63% of dentists did. Twelve percent of RDHs selected “agree” compared to 38% of dentists. However, no one in either group selected “disagree” or “strongly disagree.”

Hygienists were also more likely to indicate discomfort with how waterlines were being handled in their practices. All dentist respondents agreed or strongly agreed that the dentist and/or practice owner where they worked is committed to waterline safety. Among hygienists, 75% agreed or strongly agreed, but the remaining 25% were not convinced.

TESTING CONFUSION

Surprisingly, nearly a quarter (24%) of all respondents were not testing waterlines at all. This meant that even among those who saw themselves as working at a practice supportive of waterline safety, routine testing was not being performed. For example, 15% of respondents who “strongly” agreed or agreed their practice was following waterline safety also indicated that their practices were not ever testing.

The Organization for Safety, Asepsis, and Prevention (OSAP) recommends practices test monthly until they have passed for two consecutive months, to verify their maintenance is working.⁴ Afterward,

quarterly testing is sufficient. In our results, 23% were testing quarterly—but 24% overall were not testing at all!

“There is clearly still confusion about how to test, treat, and maintain dental unit waterlines properly,” said Hill, a key opinion leader on waterline safety. “However, this knowledge is essential for both the safety of the patient and the clinician. The only way to know if your water is safe is to test.”

WHAT’S GOING WELL

Among respondents who said they were not facing challenges, some common themes emerged: supportive teams (especially practice owners), rigorous systems, and easy-to-use equipment. A single staff member having responsibility for testing was mentioned many times. A few respondents said they worked for the government and had very strict rules about waterline quality.

WHAT RESPONDENTS WISH WAS DIFFERENT

At the end of the survey, we asked respondents if they had any questions or experiences they’d like to share. A very common theme was the wish for greater oversight of waterlines.

- “There should be a required test with results recorded outside of the office. Same as autoclaves. Regular office inspections in person should also be part of our standard of care.”
- “I wish there was an organization that checks waterlines and OSHA standards of private practices. Most times when I try to bring up such standards, it gets dismissed.”

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- “Frustrating that hygienists want to follow protocol and there is no support from the DDS. Only way to get change is to turn them in to OSHA and then they may not fire you but they will make your life miserable. The system is terrible.”

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Other clinicians emphasized the importance of buy-in from staff, especially the practice leader. Some respondents said they didn't really know how or if maintenance was being performed, as it wasn't their direct responsibility. Having a single staff member handle a particular aspect of infection control is a common and recommended practice. This also raises the point that other staff should be aware of office procedures so they can be confident the environment is safe and can answer any patient questions.

If you are confused about waterline safety, looking to build a program from scratch, or just want to update your knowledge, *RDH* has a [wealth of resources](#). [OSAP also has an exhaustive resource](#).

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THE GAME CHANGER: BIOFILM REMOVAL FOR SYSTEMIC HEALTH

According to recent scientific studies, it may be possible to reduce the risk of developing some cancers by addressing oral biofilms. Here's a deep dive into how the oral microbiome impacts systemic health.

BY ALISA COOPER, DC & JANIS SPILIADIS, CRDH



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This statistic would break most hygienists' hearts: periodontal disease increased 57% from 1990 to 2010, a number expected to upsurge in the coming years.¹ The sobering article published in *Scientific World Journal* in 2020¹ may prompt

dental hygiene professionals to take a long, hard look at the profession and the clinical techniques currently being used. Recognizing that insanity is doing the same thing over and over and expecting different results, it is clearly time for a change.

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Precipitating the change is a plethora of research on how the oral microbiome impacts systemic health. Pathogenic bacteria originating in the oral cavity can enter the systemic circulation to cause inflammation of tissues and organs throughout the body, setting the stage for chronic, degenerative disease.² Periodontopathic bacteria are implicated in many common diseases such as diabetes, cardiovascular disease, pneumonia, low-birth-weight babies, and Alzheimer’s disease.^{3,4} With compelling scientific data and new advances in dental technology at the forefront, is the dental hygiene profession continuing to use yesterday’s methods to address today’s health issues?

Protocols in dental hygiene have progressed little in nearly 100 years. Hygienists have been taught to assess, scale, and polish. Yet, there is a new way—one that focuses on *bio-film removal*. Oral pathogens do not exist in a free-floating, vulnerable, planktonic state as once thought. Instead, they reside in protective communities called biofilms bound to teeth, mucosal surfaces, and dental materials.⁵ Biofilms are everywhere—in nature and all through the body—some advantageous and others dangerous.

**UNDERSTANDING DENTAL BIOFILM
AND GUIDED BIOFILM THERAPY**

Plaque is a dangerous biofilm. Nestled within the sticky, fluid matrix of oral biofilms, pathogenic bacteria communicate, cooperate, and even exchange genetic information.⁶ They derive abundant nutrition, protection, and a way to escape detection by the host’s immune system. Over time, biofilms become more complex with

some bacteria breaking free to seed biofilms in distant locations, sabotaging systemic health.^{6,7}

The treatment of biofilms is difficult. With time and repeated exposure, the bacteria become resistant to the effects of antibiotics. In fact, bacteria in a mature oral biofilm can be as much as 1,000 times more resistant to antibiotics than the same bacteria living planktonically.⁷ Antibiotic resistance found in biofilms is creating superbugs not easily eradicated by antibiotics. While antibiotics continue to play a role in biofilm treatment, they must be used judiciously.

Bill Costerton, director of the Center for Biofilm Engineering at Montana State University, says antibiotic treatment offers only short-term benefits and is the least effective approach to treating biofilms.⁸ There is another way to effectively disrupt biofilms, but only after their impact on systemic health is known will the majority of dental practices take action and alter their standard of care.

Medicine and dentistry now widely recognize several of the many links between the oral cavity and systemic disease. Less well-known is the link between pathogenic bacteria and the development and recurrence of cancer. Research reveals those with *P. gingivalis* demonstrate a 59% increased risk of pancreatic cancer, while *P. gingivalis*, *T. forsythensis*, and *T. denticola* are linked to cancers of the oral cavity and the esophagus. Individuals with elevated levels of pathogenic oral bacteria *A. actinomycetemcomitans* and *P. gingivalis* have a greater chance of failed response to cancer treatment and are at greater risk for recurrence.⁹⁻¹⁵

According to recent scientific studies, it may be possible to reduce the risk of developing

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some cancers by addressing oral biofilms.¹⁰ While ongoing research is essential, preliminary findings have not been lost on the “Father of Biofilms,” Bill Costerton. He states, “You don’t want a bunch of bacteria hanging around in tissue for long periods of time producing strange chemicals and carcinogens.” It is important for clinicians and patients to know *why* change is necessary. Learning about cancer research begins to foster a shift in thinking, surely a step in the right direction for bringing about the change needed in dental hygiene today.

Another timely and compelling area of research fueling the change is the potential effect of biofilms on COVID-19. According to a recent study published in the *Journal of Clinical Periodontology*, patients with periodontitis are three times more likely to suffer severe complications related to COVID-19. They are also four times more likely to be admitted to the intensive care unit (ICU) and be put on assisted ventilation.¹¹

A paper published by Dr. Victoria Sampson, winner of three national dental prizes for her published works, examined the link between oral hygiene and the severity of SARS-CoV-2 infections. She considered the impact of high bacterial loads in the mouth on postviral complications and emphasized improving oral health to reduce the risk of COVID-19 complications.^{12,13}

Echoing those sentiments, *The New York Post* quoted Lior Shapira of Israel’s Hebrew University as saying, “Oral care should be part of the health recommendations to reduce the risk for severe COVID-19 outcomes.”¹⁴ Nicola West, secretary-general of the European Federation of Periodontology, emphasized the association between periodontal disease and systemic

health and reiterated the need for taking a strong preventive approach to periodontitis.¹⁵

THE NEW WAY THE GAME IS PLAYED

The act of polishing teeth is moving beyond the esthetic value of removing stain. It is going in a new direction—one focusing on biofilm removal and providing a therapeutic value for overall health. Low-abrasive air polishing systems using glycine or erythritol powders are becoming the gold standard for modern biofilm treatment and prophylaxis. These systems combine air, water, pressure, and powder to remove the biofilm efficiently and effectively—a painless, quiet process most patients say feels good.

Hand instrumentation can be time-consuming, cause potential tissue damage, and produce maximum root surface roughness. Scientific evidence suggests, on average, 47%–50% of the biofilm is left behind using conventional prophylactic methods. By employing a low-abrasive air polishing system using antimicrobial powders, 99% biofilm removal is possible.¹⁶ These air polishing systems (devices and powders) are recommended for use on dental implants because they are safe and cause no surface damage. They can also be used on the tongue and palate where biofilms often thrive.

Erythritol and glycine are fine, water-soluble powders used to increase the efficacy of air polishing. One way they do this is by decreasing pathogenic oral bacteria and increasing the population of beneficial species. Erythritol, a sugar alcohol used in many food-based products, is effective in suppressing *P. gingivalis*, the primary bacterial strain found in periodontal disease.¹⁷ Glycine, a naturally sweet, nonessential amino acid, has been shown to

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suppress inflammatory cytokines that interfere with collagen production.¹⁸

The powders also enhance air polishing systems by virtue of their particle size. Glycine particles are only 25 microns in size, and erythritol particles are a minuscule 14 microns. Small particle size makes these powders less aggressive than traditional polishing paste and gentle enough to use on supra- and subgingival tissue without harming natural or restorative oral structures.¹⁹ It is important to note that the powders must be used with compatible polishing devices. For more details, see ems-dental.com.

One cannot overemphasize the importance of a healthy oral microbiome in preventing biofilms. Daily home care is essential to biofilm management and improvement of systemic health. While much is being done to help patients maintain oral health, we must remember this is not a war on bad bugs. The goal is a balance of various strains of bacteria—both “good” and “bad”—existing in harmony.

An effective home-care strategy to maintain microbial balance is incorporating the use of oral probiotics. While many are familiar with using probiotics to establish a healthy gut microbiome, few realize their importance in balancing oral ecology and preventing oral biofilms.²⁰ Oral probiotics enhance oral and systemic health.²¹ In the process, they neutralize pH and reduce oral malodor and the feeling of a dry mouth. When tablets or melts of freeze-dried bacteria are allowed to dissolve in the mouth, they become activated by contact with saliva and enter the sulcus. There, they compete for space and resources, crowding out pathogenic bacteria and reestablishing

microbial balance. In turn, a healthy oral microbiome makes it difficult for dangerous biofilms to set up residence in the oral cavity.²²

In addition to oral probiotics, xylitol is known to inhibit the growth of pathogenic oral bacteria. Xylitol, a natural sugar alcohol, is a prebiotic or food source for beneficial bacteria with a long history of safely reducing oral pathogens such as *P. gingivalis*.²³ It is important to inform patients about this anticariogenic, antiperiodontopathic ingredient so they can switch out their gum, mints, and candy for those containing xylitol.

To keep biofilms at bay between treatments, it is important to recommend a vigorous home-care regimen. In addition to proper brushing, flossing, and tongue scraping, a water flosser is a beneficial adjunct. Since oral irrigation requires less coordination, strength, and dexterity, it can make oral home care easier for patients, which leads to increased compliance and positive results.

Additional recommendations for conquering biofilms include an effective mouthrinse and toothpaste. One such rinse is Clo⁻SYS Oral Rinse from Rowpar Pharmaceuticals. With a patented formula of chlorine dioxide, the product disrupts biofilms and the anerobic bacteria residing within. As an antimicrobial, chlorine dioxide has proven to be as effective as chlorhexidine but without side effects such as facilitation of calculus formation, discoloration of teeth, and unpleasant aftertaste. Using the toothpaste together with the mouth rinse amplifies anticariogenic action, biofilm reduction, and remineralization. The Clo⁻SYS products have a long history of safety and efficacy and are alcohol free with a neutral pH.^{24,25}

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Studies of the mouth rinse conducted by two independent, accredited laboratories showed a viral load reduction up to 98.4% within 30 seconds. Studies also showed a 99.9% reduction in viral load due to influenza A, a comorbidity often associated with deaths from COVID-19.²⁶ While lab tests alone cannot tell what happens in the mouth, essential clinical studies are underway to elucidate these findings.

CloSYS Oral Rinse is also effective as a pre-procedural rinse. It protects the patient and dental team by reducing viral loads in the aerosols generated by dental procedures, and it tastes great. Hygienists embracing positive change will want to make this preprocedural step an integral part of their appointments, while educating patients about the benefits of using the rinse and toothpaste in their daily home-care routines.

CONCLUSION

Considering the abundance of research linking biofilms to systemic health, one must pose the question: Is 50% biofilm removal acceptable in 2021? Using time-consuming, ineffective tools and technology is no longer an option, especially when they result in physical stress and fatigue for the hygienist and potential health risks for the patient.

For years, hygienists have wanted to change the public's perception of them as mere "teeth cleaners." By offering treatments using updated technology and sharing exciting information dictated by research, hygienists can change their public persona and impact lives. When patients understand why their treatments have changed, and they can see and feel the positive results of effective biofilm

removal, they may not only embrace the change but advocate for it.

While research is important, what matters most is seeing favorable outcomes. One thing seems certain: there has never been a greater need or better time for hygienists to impact the lives of their patients. With supportive scientific evidence and new technology in hand, it's time to change the game!

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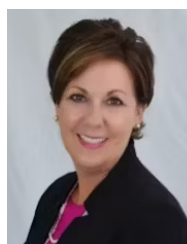
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