



Breaking the Chain

- Mastering Infection Control Basics

Scan me

BTC Infection Control

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Disclosure

Relevant Financial Relationships:

- Consultant for ProEdge Dental Water Labs, Parkell, Dove Dental, DentalPost, PDT, Zirc, Perio Protect, WaterPik
- KOL for Midmark, Air Techniques, Kettenbach, Curaden, vVardis, Incisive Technologies

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O B E C T I V E S

Objectives

- 1 Define infection prevention principles and recommendations for dental health care settings
- 2 Recognize how to prevent transmission of infectious agents through standard precautions
- 3 Employ standard operating procedures to remain in compliance with regulations
- 4 Manage a successful infection control plan

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Amanda Hill, BSDH, RDH, CDI PC



- 30+ years of clinical hygiene, speaker, author, industry educator
- Old Dominion University School of Dental Hygiene
- ADHA, AADH, ADS, VDHA, DeW.
- ADS Emerging Infection Control Leader 2022

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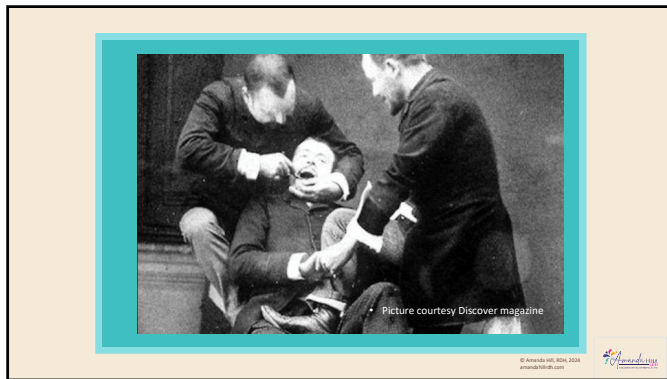
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Let's Get Real

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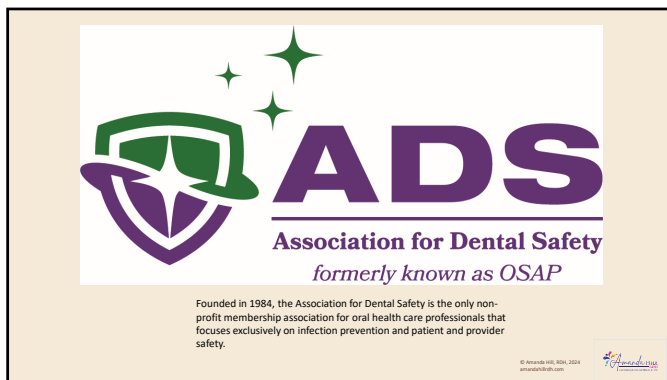
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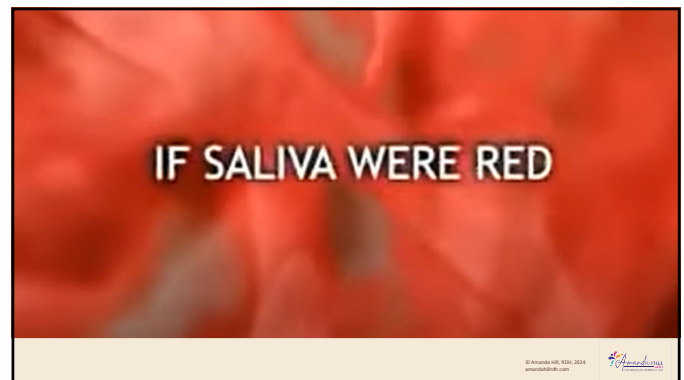
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Eye Wash Station

Weekly:

- Inspected for proper function
- Disinfect
- Keep a record



to flush for 15 minutes
• Hands free

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Ionizing Radiation

- ALADA Principles
- Radiation Survey and Inspection
- Radiation badges
 - Check your guidance
 - Recordkeeping
- Operator is 6 feet from source or behind wall
- Only person in room is patient



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Handheld X-ray devices



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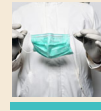
The Principles of Infection Control



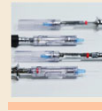
Take action to stay healthy



Limit the spread of contamination



Avoid contacting blood/body fluids



Make objects safe for use

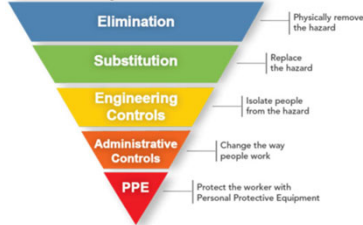
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Hierarchy of Controls

Most effective
Least effective



NIOSH (2015). Fundamentals of total worker health approaches: essential elements for advancing worker safety, health, and well-being. By Jon M. Hughes, H. Nicholas, & Cheng C. Choumanou. CC, 2015. Available at: <https://www.cdc.gov/niosh/publications/fundamentals-of-total-worker-health-approaches/>.
as part of the NIOSH Office for Total Worker Health. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. National Institute for Occupational Safety and Health. DHHS (NIOSH) Publication No. 2017-132.

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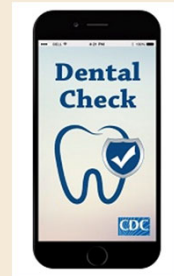
Summary of Infection Prevention Practices in Dental Settings



Basic Expectations for Safe Care



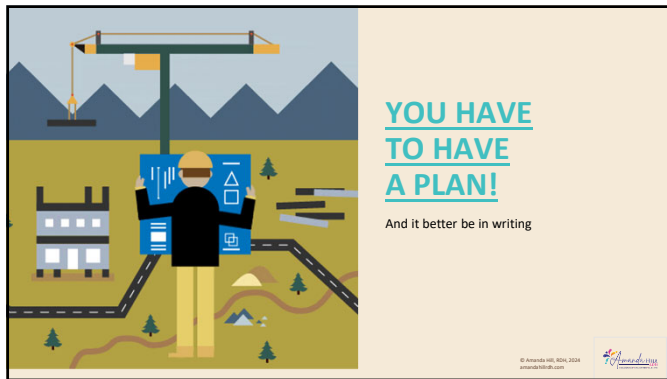
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention



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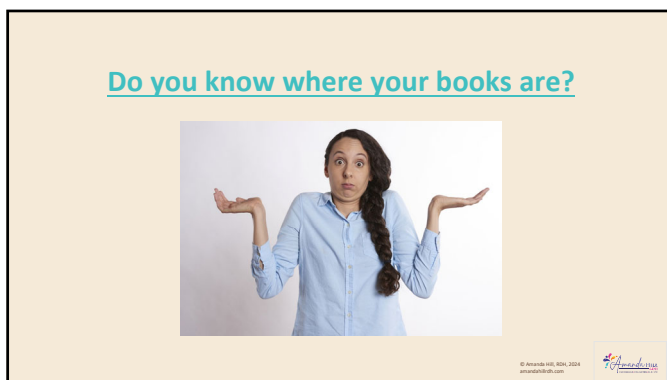
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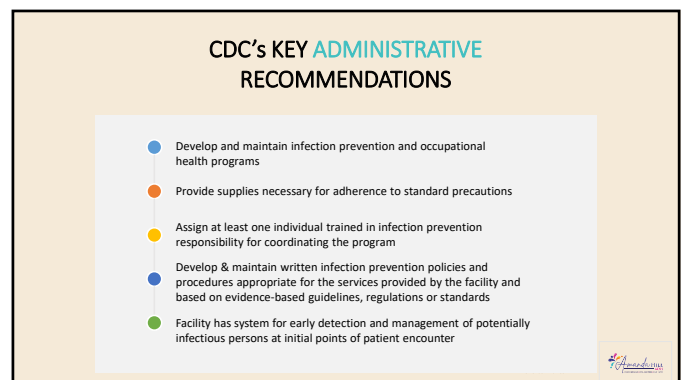
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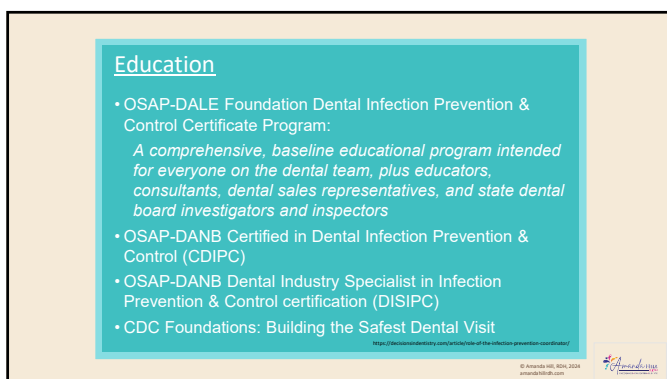
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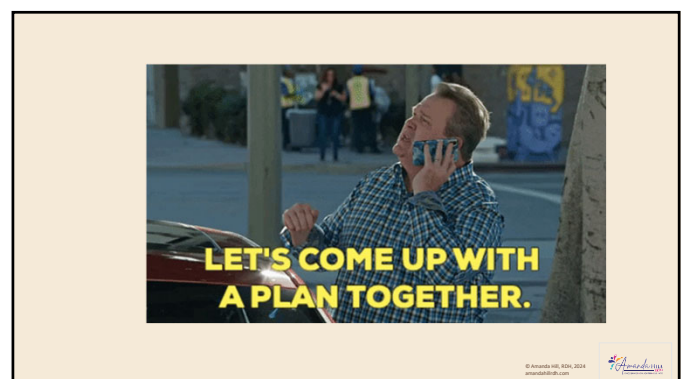
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Program Evaluation

A successful infection prevention program depends on

- Developing standard operating procedures 
- Routinely documenting adverse outcomes & work-related illnesses 
- Evaluating practices & providing feedback 
- Monitoring health care-associated infections in patients 

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Standard Precautions

Standard precautions are the **minimum** infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where health care is delivered.

Standard precautions include:

- Hand hygiene
- Use of Personal protective equipment
- Respiratory hygiene/cough etiquette
- Sharps Safety
- Safe Injection practices
- Sterilize instruments and devices
- Clean and disinfected environmental surfaces

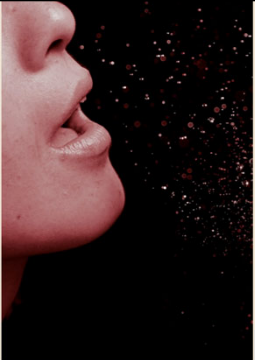


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Transmission-Based Precautions

Second Tier of Infection Control

- Patient Placement
- PPE
- Limit Movement
- Use Disposables
- Prioritize cleaning and disinfecting of rooms



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Hand Hygiene

is the most important measure to prevent the spread of infections among patients and DHCP.

Guidelines for Hand Hygiene in health care settings: <https://www.cdc.gov/hand/hygiene/guidelines.html>

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Key Hand Hygiene Recommendations

Perform hand hygiene:

- When hands are visibly soiled
- After barehanded touching of instruments, equipment, materials and other objects likely to be contaminated by blood, saliva, or respiratory secretions
- Before and after treating each patient
- Before putting on gloves and again immediately after removing gloves

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Efficacy of Hand Hygiene Techniques

Alcohol-Based Hand Rubs are More Effective in killing bacteria than soap and water

If you use them correctly

- 60-95% Alcohol
- Rub hands together
- Cover all surfaces until dry
- About 20 seconds



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Hand Hygiene Considerations

- Use lotions to prevent skin dryness
- Consider compatibility of hand care products with gloves
 - Avoid Mineral oils
- Keep fingernails short
- Avoid artificial nails
- Ensure nail polish is not chipped
- Avoid jewelry that might tear gloves



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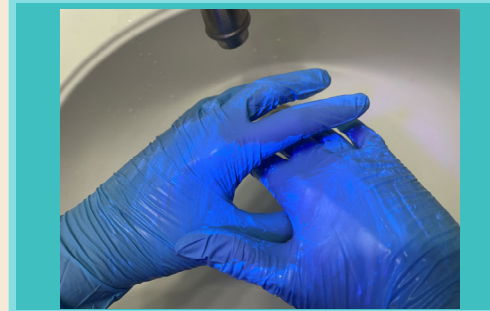
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Glo Germ



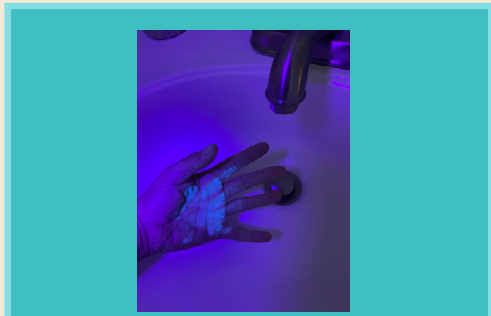
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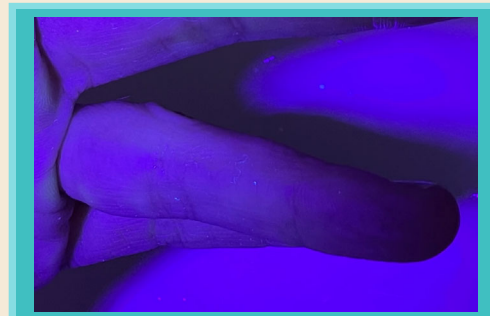
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Personal Protective Equipment

- Face Mask
- Eyewear/Face Shield
- Protective Clothing
- Gloves

- All PPE should be removed before DHCP leaves a patient-care area.
- Reusable PPE should be cleaned with soap and water, and when visibly soiled, changed.

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Masks

- Covers nose and mouth
- Check your levels
 - Level 1, 2 or 3
 - NIOSH approved N95
- Use the right mask for the task!
- Change between patients or when wet

Respiratory Protection Program should include training and fit testing to ensure an adequate seal between the edges of the respiratory and the wearers face.



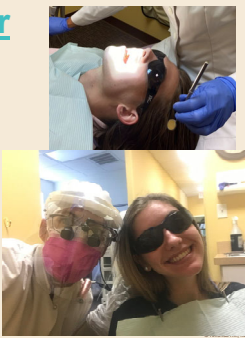
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Protective Eyewear

For both DHCP and Patient

- Side Shields
- Bottom Gap Protection*
- Or Face shield



* American National Standards Institute (ANSI) and International Safety Equipment Association (ISEA), ANSI/ISEA 187-10-2021

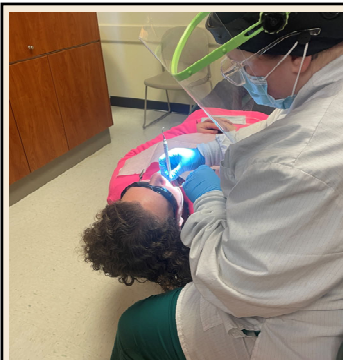
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Protective Clothing

Gowns and Lab Coats

- Only "appropriate" if it does not permit blood or OPIM to pass through
- Changed when visibly soiled
- Remove before leaving work area
- Sleeves cover forearms



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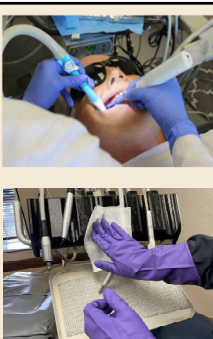


Gloves

- Prevent contamination of DHCP's hands
- Reduce the likelihood that microorganisms on DHCP will be transmitted to patient
- Wearing gloves does not eliminate the need for handwashing.
- Hand Hygiene should be performed immediately before donning gloves and after doffing gloves.

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Glove Types

Patient Exam Gloves

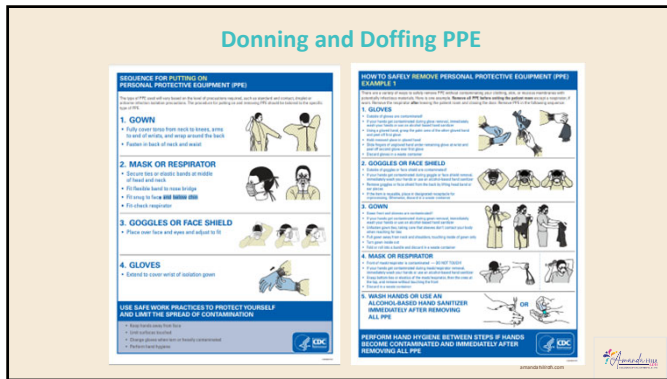
- For patient care
- One time use only
- Non-sterile

Non-Medical Gloves

- Utility gloves
- Housekeeping procedures
- Handling sharps and chemicals
- Not used in patient care
- Sanitize after use

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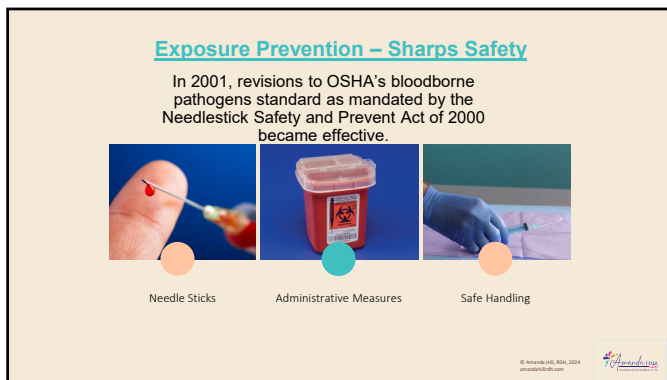
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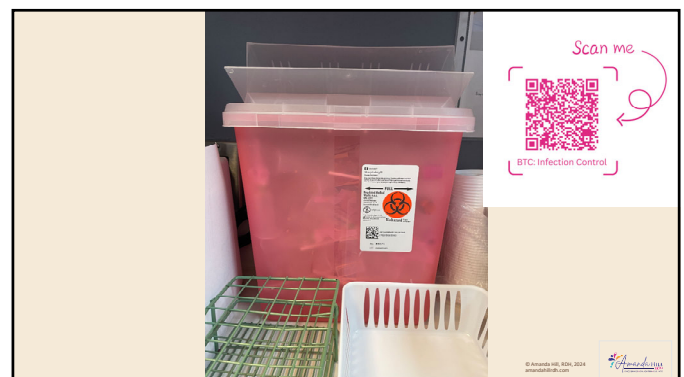
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Post-Exposure – Sharps Safety

Post Exposure Protocol

- Describe the contact possible
- Describe procedure for prompt reporting and evaluating
- Identify a referring doctor

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First Aid

Puncture Wound

- Wash area with soap and water
- Don't squeeze

Mucous Membrane

- Grab person closest to you to get SDS Sheet
- Rinse for allotted time or 15 minutes



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Document



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Follow-up

- Go to preferred provider
- Don't wait!!



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Safe Injection Practices

Prevent transmission of infectious diseases between one patient or clinician and another

- 1 Use single use disposable items when possible, used only once
- 2 Use an aseptic technique, date multiuse vial and discard after 28 days
- 3 Sterilize syringes between each use



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Sterilization & Disinfection of Patient Care Items



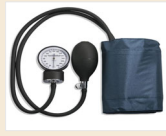
Critical Items

Used to penetrate soft tissue or bone have the greatest risk of transmitting infection
Should be heat sterilized



Semi-Critical Items

Contact with mucous membranes or nonintact skin and have a lower risk of transmission
Should be heat sterilized*



Non-Critical Items

Items that pose the least risk of transmission of infection, contacting only intact skin
Disinfect

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*Digital X-Ray Sensors, Scanners, and more

- Semicritical but heat-sensitive
- Cover with an FDA cleared barrier
- Disinfect after barrier removal



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One time Use Only



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Instrument Reprocessing

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Proper Instrument Transport

The OSHA states instruments should be:

- Transported in a hard walled plastic container with a lid



Safe-Lok Cover by Zirc



Biohazard labels by emedcor

The container should be:

- Puncture resistant
- Leak proof with solid sides and bottom
- Be labeled as a biohazard

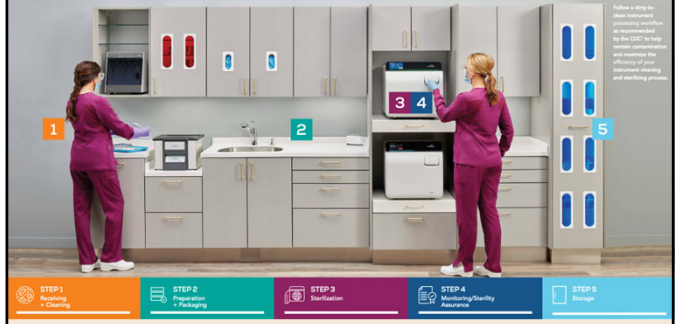
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Start with Workflow

9-STEP INSTRUMENT PROCESSING WORKFLOW



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Clean & Decontaminate

Completed **BEFORE** disinfection
and sterilization

Instrument Cleaning

- Ultrasonic units
- Instrument washer
- Thermal disinfectant
- Manual removal with brush (heavy duty gloves!!!)

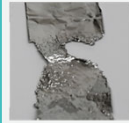


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But Does it Work??

Good Foil Test



This shows a properly functioning bath. The foil has consistent pitting (small holes) from the ultrasonic cavitation of the transducers.

Bad Foil Test



This shows a bath that may NOT be properly functioning. The foil has either inconsistent or no pitting (small holes) from the ultrasonic cavitation of the transducers.

Source: www.dentalhygiene.com



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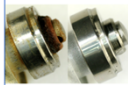
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RiteWipe®

"Preserving Your Equipment, Protecting Your Investment"

NOT A Disinfectant

HANDPIECES & ATTACHMENTS



- Air Driven & Electric Handpieces
- Motors & Attachments
- Endo, Surgical & Implant

UPHOLSTERY



- Chairs
- Stools
- Waiting Room Furniture

MORE! (ALL OTHER SURFACES)



- Dental Unit & Tubing's
- Plastics
- Sensors & Scanners

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Rinse & Dry

Follow manufacturers recommendations on rinsing instruments

- May suggest deionized water or demineralized water

Let dry completely before packaging

- Helps to reduce corrosion

Open hinged items before processing



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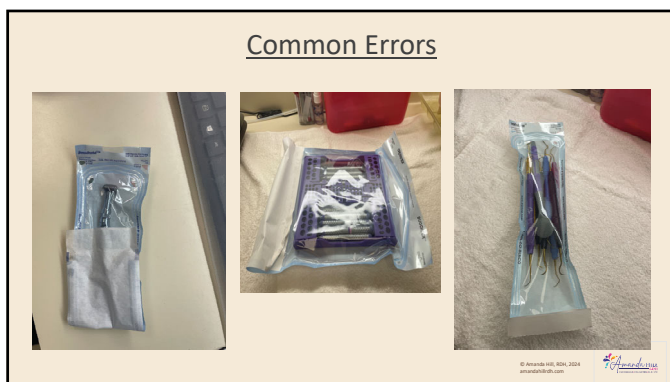
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Ready to Package

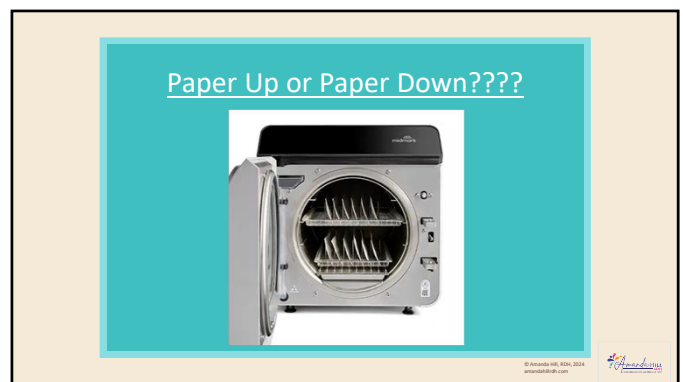
- Plastic and Paper Peel Pouch
- Wrap & Tape

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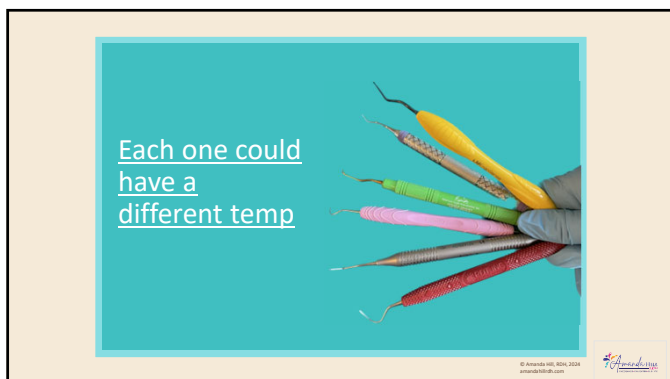
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Cycle Options

Select from 4 unique preset cycle options—including a new wrapped cycle—to help ensure compliance with both CDC and AAMI guidance.

	WRAPPED 270°F, 4 MIN		DELICATE 250°F, 30 MIN
	WRAPPED 275°F, 3 MIN		UNWRAPPED 270°F, 3 MIN

5 CUSTOM CYCLES*
250°F–275°F, 3 MIN–45 MIN

AND Preheat + Bowie Dick test cycles are available

*Custom cycles are not FDA cleared, and validation of the safety of items processed using a custom cycle is the responsibility of the user.

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What if there's a failure?

- Written Policy
 - Recall
 - Risk assessment

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Maintenance

Routine Maintenance

- Performed
- Documented

Repair

- Records Kept

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Storage

- Store in dry, closed, or covered cabinet
- Use date shelf life practices
- Examine wrapped items before use
- Do not open until ready to use
- When packaging is damaged, reprocess

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Treatment Room Disinfection

Clinical Contact Surfaces

Housekeeping Surfaces

Hazards can be reduced through a clean and organized operator

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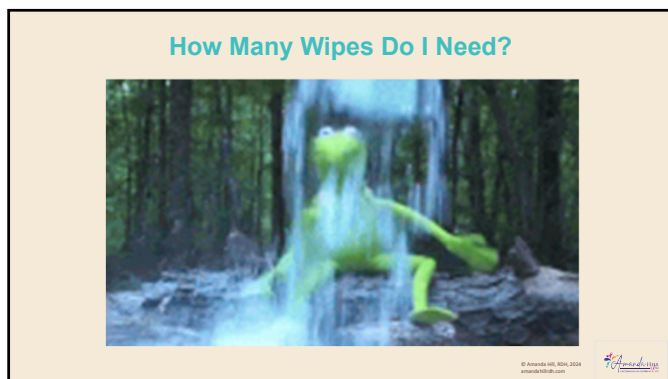
Low Have HIV and Hep B claims	Intermediate Have Mycobacterium Tuberculosis (TB) claims as well as HIV and Hep B	High Should not be used on environmental surfaces or non-critical items; glutaraldehyde
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Must appear on EPA List B and S

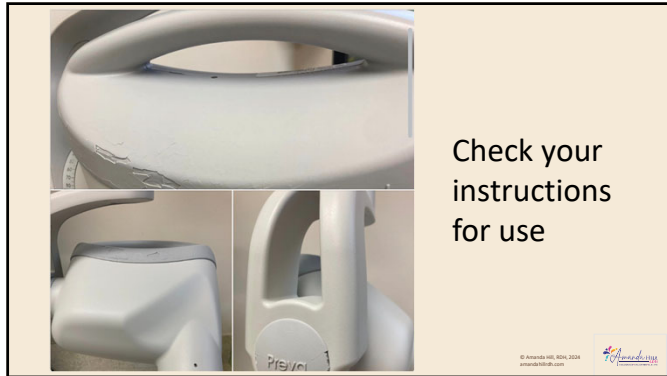
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- ## Clinical Contact Surfaces
- Use surface barriers to protect clinical contact surfaces
 - Switches on dental chairs, computer equipment
 - **CHANGE** barriers between patients
 - Clean **AND** Disinfect clinical contact surfaces that are not barrier protected
 - Use Intermediate level disinfectant (TB claim) is visibly contaminated with blood
 - Spray wipe spray or wipe discard wipe
- 
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[illegible]

- 
- ## Dos and Don'ts
- If you change products—wash
 - Don't mix products
 - No DIY
 - One Step – Two step
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- 7th Avenue Ink



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Housekeeping Surfaces



Evidence does not support that housekeeping surfaces pose a risk for disease transmission in dental health care settings.

The majority of housekeeping surfaces need to be cleaned only with a detergent and water

✓ Floors should be cleaned regularly

✓ Unless contamination is occurring; disinfecting walls, windows, drapes & other vertical surfaces is unnecessary

✓ Mops and cloths should be cleaned after use and allowed to dry before reuse, or single use disposable should be utilized when possible

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Regulated Medical Waste Management

Requires special storage, handling, neutralization, and disposal
Regulations vary by state and local authority

- Sharps waste
 - Needles, scalpels, scalers, sometimes ortho wires
- Biohazardous waste
 - Blood saturated gauze, teeth
- Hazardous waste
 - Amalgam including chairside traps, teeth with amalgam, x-ray film, certain disinfectants, adhesives and processing chemicals



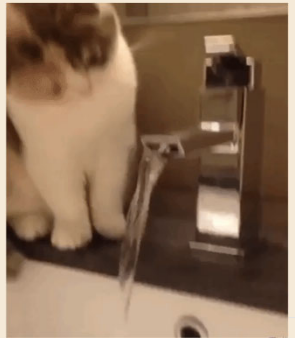
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Dental Unit Waterlines

Must meet EPA standards for safe drinking water

<500 CFUs/ mL



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Safety Game

GOOD TO GO

0-200 CFU/mL

TIME TO SHOCK

201-500 CFU/mL

SHOCK & RETEST

501 or Above CFU/mL

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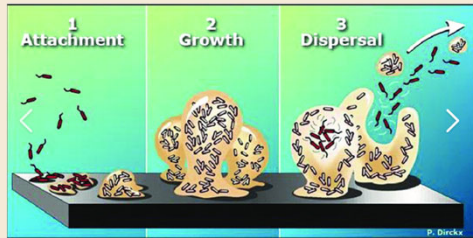
Pedicure water

501+ CFU/mL

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Dental water delivery system perfect environment for biofilm formation.....

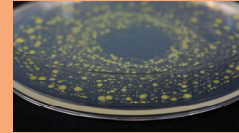


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What's in that stuff?



- *Pseudomonas aeruginosa*
- Non-tuberculous mycobacteria (NTM)
- *Legionella* species

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Patient Health

Rome, Italy, elderly woman died of Legionnaires 2012

Jonesboro, Georgia, affected 30 children 2015

Anaheim, California, 71-202 children 2016

Sweden 2017, man died from exposure to *Legionella* via contaminated cup filler

Caracas, Venezuela, 3 patients with severe infections 2020

Virginia, 1 child 2020



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Outbreaks of Nontuberculous *Mycobacteria* Infections Highlight Importance of Maintaining and Monitoring Dental Waterlines

Print



Distributed via the CDC Health Alert Network
October 31, 2022, 1:00 PM ET
CDCHAN-00478

Summary

The Centers for Disease Control and Prevention (CDC) is issuing this Health Alert Network (HAN) Health Advisory to emphasize the importance of following existing recommendations for maintaining and monitoring dental waterlines. Multiple outbreaks of nontuberculous *Mycobacteria* (NTM) infections have occurred in children who received pulpotomies in pediatric dental clinics where the dental treatment water contained high levels of bacteria. CDC provides guidelines on infection control in dental settings which contain recommendations to treat dental unit waterlines and monitor water quality. Dental providers should be familiar with these recommendations on how to properly maintain and monitor their dental equipment to ensure that dental treatment water is safe for patient care.

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Adult NTM odontogenic post operative infections (Venezuela 2020)

- Three patients with a facial cutaneous sinus tract of dental origin, due to NTM infection (*Mycobacterium fortuitum*, *M. abscessus* and *M. peregrinum*).
- The infection source was the dental unit waterlines colonized with NTM.



Fig. 1 a-e The three patients from Caracas, Venezuela, showing the sinus tract for a diagnosis of a dental sinus tract caused by respectively a *M. fortuitum* and *M. abscessus* infection. a and b Patient 1 and patient 2 with the diagnosis of a dental sinus tract caused by respectively a *M. fortuitum* and *M. abscessus* infection. c and d Patient 3 with an infection due to *M. peregrinum*. Shown are the cutaneous facial sinus tract and an affected lymph node draining in the neck. The affected lymph node in the neck was removed with surgery. e A panoramic radiograph of the patient 1 showing a radiolucent lesion of the periapical area of a mandibular molar (white arrow).

Pérez-Alfonzo et al. BMC Infectious Diseases (2020) 20:295
<https://doi.org/10.1186/s12879-020-05015-5>

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Anaheim Outbreak

Infections with Lifelong Impact

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Patient Infections
Ages 2-11

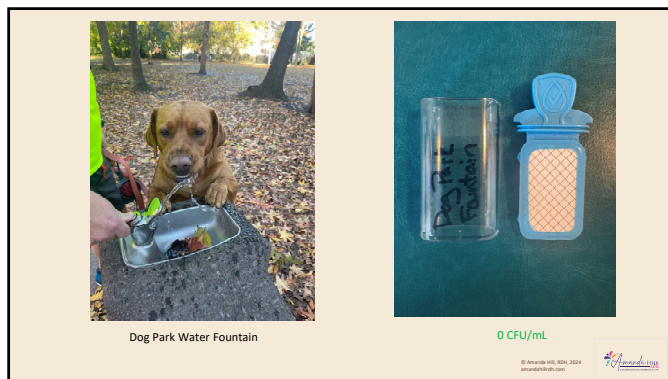
99%
Were Hospitalized
& Required
Surgical Debridement

85
Median # of Days Before
Symptoms Presented
(Range: 1 – 409 days)

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Clinician's Health

- Aerosol-o-phobia

.....dental unit water lines, as a major basis of aerosol bacteria in the dental environment.



Kumar, R and Subramanian, K., 2020. Demystifying the mist: sources of microbial biobload in dental aerosols. *Journal of Periodontology*.
Meethil, AP, Sarinawat, S, Chaudhary, PP, Dabdouh, SM, Kumar, PS. 2021. Sources of SARS-CoV-2 and other microorganisms in dental aerosols. *J Dent Res* July 2023
Rafiee A, Carvalho R, Lunsford D, Flores-Mir C, Meyer R, Quemeraiis R, Altahboubi K. Particle Size, Mass Concentration, and Microbiota in Dental Aerosols. *J Dent Res*. 2022 Jul;101(7):785-792. doi: 10.1177/00220345221087880. Epub 2022 Apr 6. PMID: 35384778; PMCID: PMC9220116.

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Waterline Protocol

Shock

- Before any new treatment
- Regularly (every 90 days to start)
- When DUWL test reveals 200CFUs/ml or more

Treat

- Continuous waterline treatment helps control bacteria growth
- Follow the IFUs
- New untreated lines can reach up to 200,000 CFUs in 5 days
- Flush lines-daily and in between patients

Test

- Test ALL lines monthly
 - <500 CFUs/ml
- Once passing consistently, test quarterly (and document)



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Ice on Delta Flight



0 CFU/mL

106

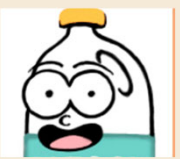
Shock



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How to shock

- Airflush line
- Choose your solution and READ the instructions
- Mix product and pay attention to use life
- Add recommended amount to your Dental Unit Water bottle (make sure you have a dummy straw in place, if needed)
- Re-Attach the Bottle to the Unit
- Run shock into EACH line-run each line until you see, smell, or feel it (your ultrasonic scaler will take forever)



Disclaimer! Always check your manufactures IFUs

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How to shock continued.....

- Leave it for recommended time. That could at 10 minutes to overnight
- MORE ISN'T BETTER
- Place Shock In Progress sign
- Disconnect the bottle and dump it in the sink (do not use your suction!) or run the rest of the product through.
- Refill Bottles with warm water and flush the line for 1-3 minutes or until entire bottle.



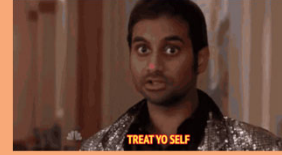
Disclaimer!- Always check your manufactures IFUs

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Treat



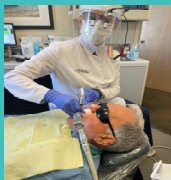
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You Want Both!

Shocking =
Perio Maintenance Visit



Treating=
Homecare



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Tablets

- Determine the size of your bottle and how many tablets you need
- Place tablet(s) in empty dental unit waterline bottle or gallon jug
- Let the tablet effervesce before re-attaching the bottle or closing the lid



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Tablets



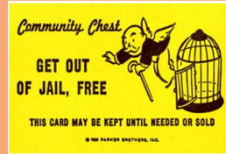
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Straws/Cartridges

- Remove bottle and attach straw per the instructions for use
- Set a note in your appointment book for when you are due to replace your straw



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Straws



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BluTube® Dental Unit Water Purification Cartridge



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Liquids



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118



Toilet water



0 CFU/mL

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In-Office Testing

- 100% Confidential
- Imprecise CFU/mL
- More economical
- ADS recommends higher frequency
- Results in 15 minutes -7 Days



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Mail-In Lab Testing

- 3rd Party Verification
- More precise results
- Overnight Shipping
- Report Emailed
- Results in 1-7 Days

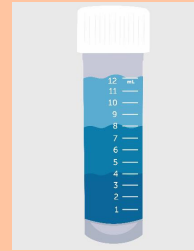


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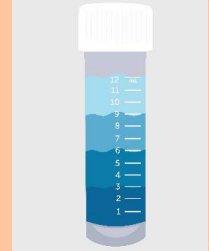
Pooled or combined samples



3 or 4 samples from the same operatory or bottle can be combined in a single sample

Pass = all lines pass

Fail = shock all lines and retest



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What if I fail?

- Shock 3 times
- Try another shock product
- Check for dead legs
- Test your source water
- Check your filters



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Flushing vs Purging

- Flush in the morning and between each patient for 20-30 seconds
- Purging is only recommended for extended absences



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Dental Waterlines and Surgery

- Use sterile saline or sterile water as a coolant/irrigator when performing surgical procedures
- Use devices specifically designed for the delivery of sterile irrigating fluids



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Surgery Definition – 2003 Guideline

- The incision, excision, or reflection of tissue that exposes the normally sterile areas of the oral cavity”
- Examples:
 - Biopsy
 - Periodontal surgery
 - Apical surgery
 - Implant surgery
 - Surgical extractions requiring flap reflection, manipulation of bone or sectioning
 - Endo/pulpotomies



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Suction



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To close or not to close



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Backflow

According to the CDC, Backflow occurs when previously suctioned fluids present in the suction tubing flow back into the patient's mouth. Backflow can occur when:

- There is pressure in a patient's mouth (a result of closing their lips and forming a seal around the tip of the ejector) that is less than in the saliva ejector (similar to how liquid flows back into a cup after drinking through a straw).
- The suction tubing attached to the ejector is positioned above the patient's mouth.
- A saliva ejector is used at the same time as other evacuation (high-volume equipment)

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Do you want that in your mouth?



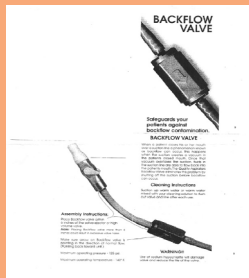
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In-line Backflow Valves



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Backflow Preventers



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Run Suction Every day

- And sometimes between patients.....



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Side-by-side Comparison

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What's in a good suction product

- pH between 6-8
- Non foaming
- NO Chlorine
- Compliant with EPA 2020 Rule
- Safe for staff and patients
- Cost effective
- Chelating agents
 - Works with all types of water
 - Loosens calcifications to improve pump flow



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Suction Line Protocol

Daily

- Run suction lines with EPA approved cleaner
- end of day and between surgery patients
- Use atomizer dispenser
- Farthest from vacuum to closest

Weekly

- Change chair traps
(more if necessary)

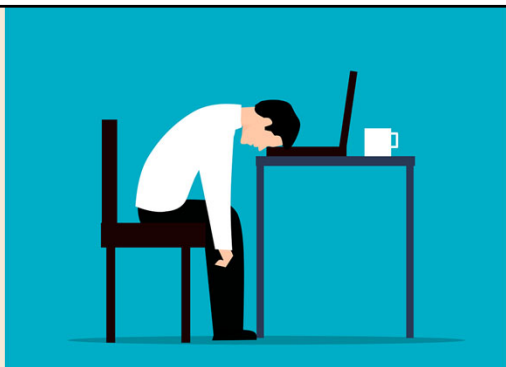
Monthly

- Change trap on vacuum
- Check amalgam separator with UV flashlight (change when at fill line)

NEVER put bleach in your suction lines



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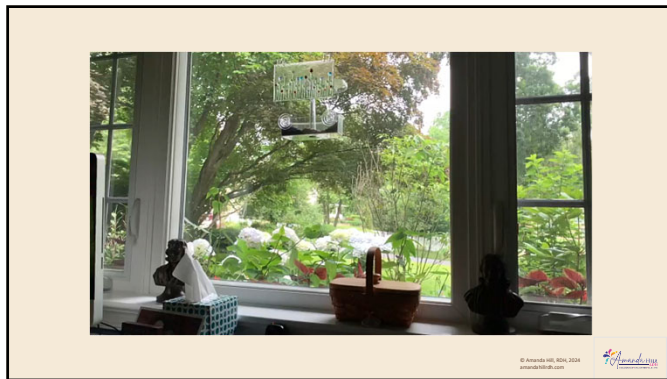
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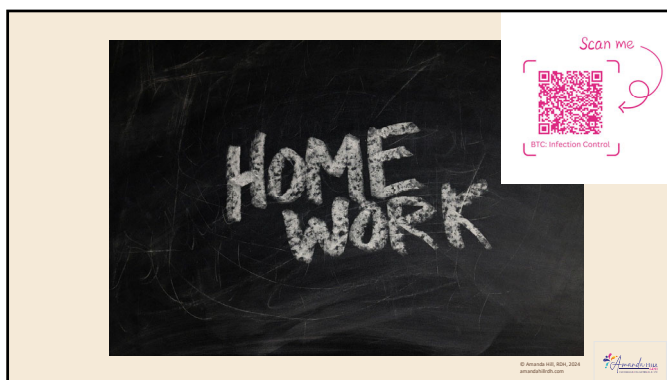


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Pre-Mortem Activity

1. Find a partner – someone you don't work with
2. Each person identify 3 Infection Control practices where you see a breakdown *could* occur
3. Discuss how you can strengthen training and protocols PRIOR to a breach

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Want a **FREE** waterline test?

ProEdge
DENTAL WATER LABS

1 FREE QUICKPASS® WATER TEST
<https://proedgedental.com/amanda-hill>

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Resources:

Model plans and programs for the OSHA Bloodborne Pathogens and Hazard Communications standards
<https://www.osha.gov/sites/default/files/publications/osha3186.pdf>
 OSHA Medical and Dental Office- A guide to Comply
<https://www.osha.gov/sites/default/files/publications/osha3187.pdf>
 OSHA Poster
<https://www.osha.gov/publications/poster>
 Hierarchy of controls
 NIOSH [2016]. Fundamentals of total worker health approaches: essential elements for advancing worker safety, health, and well-being. By Lee MP, Hudson H, Richards R, Chang CC, Chosewood LC, Schill AL, on behalf of the NIOSH Office for Total Worker Health, Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2017-112.
 Device Screening form:
<https://www.cdc.gov/oralhealth/infectioncontrol/pdf/screening-update.pdf>
 Device Evaluation Form
<https://www.cdc.gov/oralhealth/infectioncontrol/pdf/device-update.pdf>

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