



Module G

APPLYING PRINCIPALS OF STERILIZATION AND DISINFECTION DENTAL SETTING

Statewide Program for Infection Control and Epidemiology
(SPICE)

UNC School of Medicine



OBJECTIVES



- Review Management of:
 - Housekeeping/Clinical Contact Surfaces
 - Medical Waste
 - Dental Unit/Waterlines
 - Radiology/Laser/Electrosurgery



ROLE OF THE ENVIRONMENT

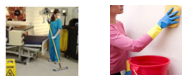


Clinical



- High potential for direct contamination
- Spray or splatter
- Frequent contact with healthcare personnel's hands

Housekeeping



- No direct contact with patients or devices
- Little risk of transmitting infections



MANAGEMENT OF HOUSEKEEPING SURFACES

No blood/body fluids present (non-clinical areas):

- Water, detergent, mop/cloth
- Clean and dry OR use disposable mop

Presence of blood/body fluids (patient care areas):

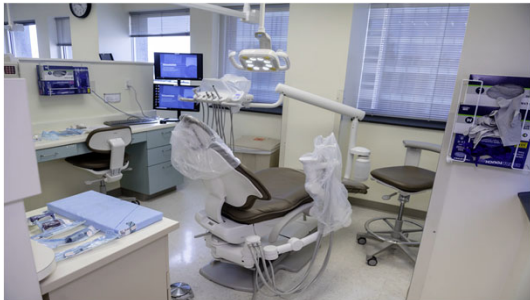
- Wipe/mop surface with an EPA-registered disinfectant
- Do not re-dip contaminated wipes into disinfectant solution
- Cloth mops and disinfectant solution should be changed every 3 rooms or 60 minutes
- Mico-fiber mops should be changed every room

Walls, blinds, drapes cleaned when dusty



MANAGEMENT OF CLINICAL CONTACT SURFACES

Video Clip: To start the video click on the image.



MANAGEMENT OF CLINICAL CONTACT SURFACES

- Clinical contact surfaces have a high potential for direct contamination:
 - From patient materials either by direct spray or splatter
 - From contact with gloved hands during patient care
- Clinical contact surfaces need to be disinfected:
 - Before they become involved in the care of the next patient
- Examples include:
 - Light handle
 - Countertop
 - Bracket tray
 - Dental chair



SOURCES OF CONTAMINATION



- Contaminated gloves and hands of dental healthcare personnel



- Contaminated instruments or other inanimate objects



- Aerosol/splatter



MANAGEMENT OF CLINICAL CONTACT SURFACES

Surface protection

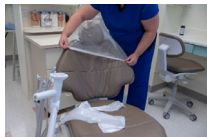


Surface Disinfection



SURFACE PROTECTION OF CLINICAL CONTACT SURFACES

- Surface covers should be impervious to fluids
- Examples- clean plastic wrap, bags, tubes, and plastic backed paper
- Covers for some specific items are available
 - Single use
 - Changed between patients
 - If a barrier fails, disinfect the underlying surface



SURFACE CLEANING/DISINFECTION OF CLINICAL CONTACT SURFACES

- Use an EPA-registered disinfectant with a HIV/HBV or TB claim.
- Required for exposed clinical surfaces after treating an individual patient.
- Required at the end of the day.
- Pre-clean and disinfect the surface after contamination and before each use.
 - Spray-wipe-spray: using a liquid disinfectant/cleaner
 - Wipe-discard-wipe: using a disinfectant towelette



CLEANING RECOMMENDATIONS

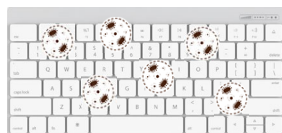
Clean and disinfect surfaces using correct technique

- Physical removal of soil (elbow grease)
- Contact time
- Correct type of cleaning materials
- Wear appropriate PPE (gloves, gown, mask, eye protection)






DISINFECTION OF COMPUTER KEYBOARDS


- Keyboards can be effectively disinfected using most EPA registered disinfectants *(for example):*
 - Quaternary ammonium compounds
 - 70% isopropyl alcohol
 - Phenolic
- Current recommendations are to disinfect keyboards daily and when visible soiled



MEDICAL WASTE EXTRACTED TEETH


- Without amalgam:
 - Not considered regulated medical waste
 - Can be discarded in regular trash
- With amalgam:
 - No incineration for final disposal
 - Consult state and local regulation.
- Shade comparison:
 - Disinfect with intermediate level EPA-registered hospital grade disinfectant before sending to the laboratory



MEDICAL WASTE EXTRACTED TEETH


- Handling extracted teeth in educational setting
 - Remove visible blood and debris
 - Maintain hydration
 - Autoclave (teeth with NO amalgam)
 - If tooth has amalgam, do not heat sterilize, alternatively immerse in 10% formalin for two weeks
 - Use Standard Precautions




KNOWLEDGE CHECK

True or False:
Strategies for cleaning and disinfection of dental surfaces should consider all of the following:


1. Potential for patient contact
2. Degree/frequency for hand contact
3. Potential for contamination of surface



True



False



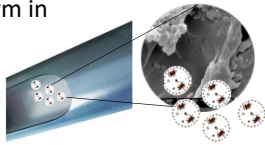
DENTAL UNIT WATERLINES

- Colony counts in water from untreated systems can exceed 1,000,000 CFU/mL
CFU=colony forming unit
- Untreated dental units cannot reliably produce water that meets drinking water standards
- Limited pathogen potential
- Few reports of waterborne infections
- Exposing patients to water of uncertain microbiological quality is inconsistent with infection control principles



DENTAL UNIT WATERLINES AND BIOFILM

- Microbial biofilms form in small bore tubing of dental units
- Biofilms serve as a microbial reservoir



DENTAL WATER QUALITY

For routine dental treatment, meet regulatory standards for drinking water.*



* <500 CFU/mL of heterotrophic water bacteria



AVAILABLE DUWL TECHNOLOGY

- Independent reservoirs
- Chemical treatment
- Filtration
- Combination



MONITORING OPTIONS



- Water testing laboratory (UNC School of Dentistry)
- In-office testing with self-contained kits
- Follow recommendations provided by the manufacturer of the dental unit or waterline treatment product for monitoring water quality (weekly or monthly)
- Discharge water and air for a minimum of 20-30 seconds after each patient



STERILE IRRIGATING SOLUTIONS

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



DISEASE TRANSMISSION (DUWL)

2011	82 year old female, diagnosed with legionellosis and died two day later;	Only known risk was two dental appointments; Molecular testing identified DUWL as source
2015	<i>Mycobacterium abscessus</i> odontogenic infections in children undergoing pulpotomy	Suspected source of the <i>Mycobacterium</i> was contaminated water from dental unit waterlines

SPECIAL CONSIDERATIONS

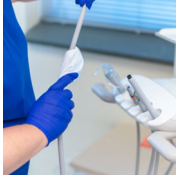
- Dental handpieces and other devices attached to air and waterlines
- Saliva ejectors
- Single-use (disposable) Devices
- Pre-procedural mouth rinses

DENTAL HAND PIECES AND OTHER DEVICES

- Dental handpieces and other devices attached to air and waterlines:
 - Clean and heat sterilize intraoral devices that can be removed from air and waterlines
 - Follow manufacturer's instructions for cleaning, lubrication, and sterilization
 - Do not use liquid germicides or ethylene oxide



DEVICES PERMANENTLY ATTACHED TO WATERLINES



- Do not enter patient's mouth but may become contaminated
- Use barriers and change between uses
- Clean and intermediate-level disinfect the surface of devices if visibly contaminated

SALIVA EJECTORS

- Previously suctioned fluids might be retracted into the patient's mouth when a seal is created
- Do not advise patients to close their lips tightly around the tip of the saliva ejector



SINGLE-USE (DISPOSABLE) DEVICES

- Intended for use on one patient during a single procedure
- Usually not heat-tolerant
- Cannot be reliably cleaned
- Examples: Syringe needles, prophylaxis cups, and plastic orthodontic brackets, sterile irrigation water
- FDA Law prevents reuse or reprocessing of "labeled" single use patient products or devices



PREPROCEDURAL MOUTH RINSES

- Antimicrobial mouth rinses prior to a dental procedure
 - Reduce number of microorganisms in aerosols/spatter
 - Decrease the number of microorganisms introduced into the bloodstream
- Unresolved issue—no evidence that infections are prevented



KNOWLEDGE CHECK

Which statement about single use devices is true?

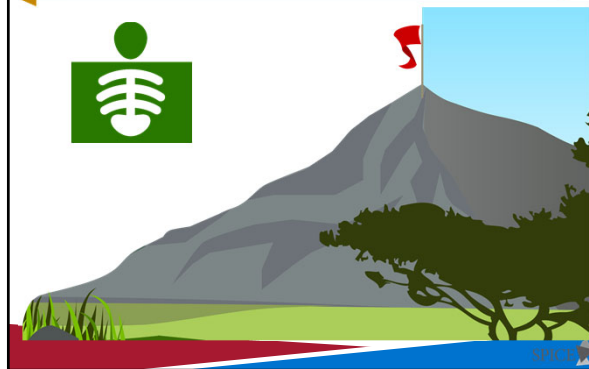
1. They can be cleaned and disinfected and reused
2. If they are not visible contaminated, they can be reused



They are intended for use on one patient during a single procedure



RADIOLOGY/LASER/ELECTROSURGERY



DENTAL RADIOLOGY

- Gloves should be worn when taking radiographs and handling contaminated film packets
- Other PPE should be used if spattering of blood or other body fluids is anticipated
- Heat tolerant versions of intraoral radiograph accessories are available and should be heat sterilized before patient use
- Semicritical items that cannot be sterilized or high level disinfected should:
 - Be barrier protected by using an FDA-cleared barrier
 - Cleaned with EPA registered hospital disinfectant after barrier removed



LASER/ELECTROSURGERY PLUMES AND SURGICAL SMOKE

- Destruction of tissue creates smoke that may contain harmful by-products
- Infectious materials (HSV, HPV) may contact mucous membranes of nose
- No evidence of HIV/HBV transmission
- Need further studies
- Follow NIOSH recommendations
- Use standard precautions



REFERENCES

- CDC. Guidelines for infection control in dental health-care settings, 2003. MMWR 2003;52 (RR-17):1-68
- CDC. Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care, 2016
- Rutala WA, Weber DJ, HICPAC. CDC guideline for disinfection and sterilization in healthcare facilities, 2008