1 **OSHA & INFECTION CONTROL UPDATE**

6 Hours CE

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2 **LOOK BACK – LAST YEAR**

DID YOU……

- Have accidents or exposures?
- Start using any new technology?
- Have any staff changes?
- Move or remodel the office?
- Update your safety policies?
-

3 **TOP 5 SAFETY GOALS**

- Have a plan
  - Written Safety Program
- Assign a person
  - Safety Manager
- Identify the enemy
  - Recognize & Understand Risks
- Keep everyone safe
  - Implement Standard Precautions
- Plan B
  - Plan for exceptions and accidents

4 **THE RULES**

- CDC Recommendations
  - Based on research
  - Set standards, not "laws"
- OSHA: Occupational Safety & Health Administration
  - Based on CDC recs
  - Worker safety
  - Rules are laws
- State Board laws
  - Include CDC & OSHA & ADA standards
- Civil & Health Dept.... Laws
- Competition, marketing, reputation

5 **UPDATE & EDIT YOUR IC PLAN**

- Injury & Illness Prevention Program
  - OSHA manual
- Standard Operating Procedures (SOP's) = written step-by-step plans
- Location? Training?

- Must be specific & accurate
  - Surface disinfection
  - Hand hygiene
  - Instrument processing
  - Dental waterlines

6 **NEW CDC RECOMMENDATIONS**

https://www.cdc.gov/OralHealth/infectioncontrol/guidelines/index.htm

Checklists!

To be used along with 2003 Infection Control Recommendations

7 **NEW OSHA CHEMICAL CLASSIFICATIONS**
WWW.OSHA.GOV

- A: Health risks
- B: Chemical risks
- MSDS = SDS, now 16 sections, in specific format
- New labels: must have:
  - Name of product
  - Single word (warning or danger)
  - Statement of hazard

8 **UN'S GLOBALLY HARMONIZED SYSTEM**
HAZARD WARNING PICTOGRAMS

9 **2 TOP SAFETY GOALS**

- Written Safety Program
  - OSHA manual – personalize & update it
  - Enforce it
  - California IC laws
  - CDC recommendations
  - Instructions for use, operation manuals….
- Safety Manager
  - Qualified, trained, empowered, recognized leader
-

10 **CHAIN**
OF
INFECTION

11 **BREAKING**
THE CHAIN

12 **INFECTION TRANSMISSION ROUTES**

- Percutaneous exposure
  - Open tissue, lesions, injury, dental care (pt.)
- Mucosal, ocular tissue exposure
  - Absorption
  - Injury (fragile)
- Direct skin contact with source

- Indirect skin contact with contaminated item, surface
  - Instruments, counters, waste, lab case
- Ingestion
- Inhalation – aerosols, droplets

13 **STANDARD PRECAUTIONS**
MINIMUM STANDARDS FOR ALL PATIENTS

- Hand hygiene
- PPE
- Respiratory hygiene / cough etiquette
- Sharps safety
- Safe injections
- Instrument, device sterilization
- Environmental asepsis cleaning, disinfection, barriers

Witten protocol shall be developed, maintained, and periodically updated for proper instrument processing, operatory cleanliness, and management of injuries.

14 **STANDARD PRECAUTIONS**

- Proven effective for controlling
  - Bloodborne diseases
  - Contact diseases
  - Droplet diseases
- Not effective for airborne diseases

15 **BLOODBORNE DISEASES**

- Acute:
  - Symptomatic / asymptomatic
- Chronic: antibodies: ineffective
  - HBV: highly infective, → cirrhosis, liver failure, cancer, death. Vaccine & antiviral meds
  - HCV: less infective, often asymptomatic (20-30 years), undiagnosed → cirrhosis, liver failure, cancer, death. No vaccine, but antiviral meds,
  - HIV: variable infectivity, → CD4 cell destruction immunosuppression, cancer, death. No vaccine but antiretroviral meds (ART).

16 **BLOODBORNE DISEASE RISKS**

- Per-mucosal or percutaneous exposure
- Risky sexual activity
- IV drug use
- Body modification
- Household exposure
- Sharing personal sharps
- Immunocompromised
- Travel
-

17 **MOST LIKELY DENTAL EXPOSURES**

- Percutaneous
  - Needles

- Burs
- Instruments, files

- Compromised skin
- Mucosal exposure
- HBV = efficiently transmitted directly & indirectly (survives on surfaces – 7 days)

18 **RISK OF INFECTION AFTER NEEDLESTICK**

1 Source

HBV .....

HCV .....

HIV .....

2 Risk

6.0-30.0%

1.8%

0.3%

19 **VIRAL HEPATITIS**

- Infection with ≥ viruses that attack liver
- Most common in U.S.: Hepatitis A, B, C
- Hepatitis A
  - Fecal – oral: spread by food & water contaminated with feces
  - Lasts weeks to months, not chronic
  - Usually resolves spontaneously
  - Vaccine is available
- Other types: hepatitis D, E, G, & Transfusion Transmitted Virus (TTV)

20 **HEPATITIS B**

1 1980 - 2013

2 Incidence declined since 1991
(infant vaccinations)

3 2015 CDC Report

4
- At least 21% increase in acute HBV cases
- Due to injected drug use
- Grossly under-reported

-

- Chronic cases also under-reported
  - 850,000 – 2.2 mil cases???

21 **HBV BOOSTERS & TREATMENT**

Boosters?

- Vaccine gives immunologic memory ≥ 23 years
  - No boosters formally recommended
- Boosters may be needed sooner for immunocompromised pts & hemodialysis pts.
- Get tested. Know your status!

Treatment:

- If exposed, TX = booster vaccine, maybe HBIG
- Vaccine MUST be offered, even to pre-vaccinated workers. Best within 24 hrs.)
- Antiviral drugs - IMPROVED

22 **HEPATITIS C (HCV)**

- Most common chronic bloodborne infection in U.S.
- 2.7 – 3.9 million Americans have chronic HCV
  - 4 X more than either HBV or HIV
- Most chronic HCV carriers are baby boomers
  - Born 1946 – 1964
  - ~75% = unaware of infection

23 **HEPATITIS C (HCV)**

- Some people clear infection
- 85% develop chronic HCV
- Can result in chronic liver disease, cirrhosis, liver cancer, death
- Subclinical, asymptomatic 10 – 20 years
- Some types of HCV can be cured
- No vaccine

HCV-related oral ulcerative lesions →

24 **TODAY'S TESTING REC'S**

- Test all high risk groups
- 1 time test for all baby boomers regardless of risk
  - 60% of DDS's = born 1945 – 1965
- New Rapid (40 min.) antibody tests
  - Venipuncture, finger-stick (less reliable)
  - OraQuick
  - Detect past or present HCV infection
  - Must be followed up with nucleic acid test (NAT) for viral RNA

25 **WHY SHOULD YOU GET TESTED FOR HEPATITIS C (HCV) ?**

- Antiviral drugs:
  - Eliminate virus or lower viral load
  - May reduce complications & progression
- Some types of HCV can be cured

26 **INSECT-BORNE DISEASES**

- Malaria, Dengue, Zika, Yellow fever, Lyme, West Nile, chikungunya
- Primarily vector transmitted
- Treat as bloodborne disease

27 **HIV UPDATE**

1 • Every 5- 7 sec. Someone = infected (worldwide)

- Virus attacks CD4 cells, weakens & destroys immune system
- Patient becomes susceptible to opportunistic infections
- Early TX before CD4 cells drop is vital
- Oral signs may be first clue

- 2 Infections are more severe & last longer
-

28 **HIV UPDATE**

- 34 years since CDC first identified HIV
- NO cases of patient to dental worker HIV transmission
- No vaccine, but vital antiretroviral meds cut transmission to partners by 96%
- 20% of infected = unaware of status
- Early TX saves lives!
- Education is the key!
-
-

29 **HIV / AIDS - CURRENT STRATEGIES**

- Rapid HIV type 1 + 2 Test: OraQuick:
  - Mouth swab or blood test
  - 99% accurate, 1 min. result
  - For source person testing or gen. Screening
  - Pre-arrange with Occupational Health M. D.

30 **IS YOUR TEAM SAFE?**

31 **SAFE RE-CAPPING**

- Only recap needles using:
  - Scoop technique or:
  - Mechanical devices designed to
    - hold needle sheath
    - eliminate need for 2 handed capping

32 **SHARPS & WASTE**

- Follow OSHA rules
- Dispose of <u>all sharp items</u> in puncture resistant containers
- Dispose of pharmaceutical waste as per EPA
- Dispose of contaminated solid waste as per EPA
  §1005 (b) (9, 22)
-

33 **POST EXPOSURE PROPHYLAXIS**

- Exposure packet
  - Phone numbers, forms, driving directions, payment arrangements
- Direct MD re: testing, disclosure, include HCV!
- Rapid HIV, HCV testing
- Response windows for maximum effect:
  - HIV - ART – 2 hours
  - HBV – 24 hours

- HCV – 24 hours
- PEP follow-up: after exposure test 3-6 weeks, 3-6 months, 9 months
- Counseling
  -
-

34 ☐ **ARE YOU SET UP?**

35 ☐ **4 SAFETY GOALS**

- Recognize & Understand Risks
- Vaccines
  - Educate staff (CDC.gov)
- Sharps safety
  - Handling & waste
- PEP
  - Exposure incident package
  - Records
  - Follow-up
-

36 ☐ **HAND HYGIENE**

- Hand hygiene is the single most important factor in transmission of disease
- 88% of dis. Trans. Is by hand contact
- 'Resident' skin flora is permanent (IN skin)
- 'Transient' flora is temporary (ON skin)

37 ☐ **HOW LONG SHOULD YOU LATHER FOR FIRST & LAST WASH OF THE DAY?**

A. 20 seconds
B. 40 seconds
C. 5 minutes
D. 1-2 minutes

38 ☐ **HOW LONG SHOULD YOU LATHER WHILE WASHING REPEATEDLY DURING DAY?**

A. 1 minute
B. 15 seconds
C. 20 seconds
D. 30 seconds

39 ☐ **SOAP DISPENSER CONTAMINATION**

- Microbial contamination of soap linked to infections & outbreaks in hospitals
- 25% of refillable containers had bacteria
- 16% had coliforms
- Some bacteria remains on hands after washing
- No bacteria found in sealed (1 use) dispensers

40 **MOST RECOMMENDED: COMBINED PROTOCOL**

1 Plain soap – routine handwashing

3 Antimicrobial / alcohol hand rub on unsoiled hands

41 **HOW LONG SHOULD THE ALCOHOL SANITIZER STAY WET ON YOUR HANDS?**

2 5 seconds

8 seconds

15 seconds

20 seconds

42 **WATERLESS HAND-RUB SAFETY**

- Should have ethanol, not isopropyl alcohol
  - Less drying to skin
  - More effective vs. Viruses
- Must have enough emollients for heavy clinical use
- FDA cleared for medical use
  - "Safe and effective"

43 **HAND ASEPSIS: DID YOU KNOW…**

- Inflamed, irritated skin retains more bacteria, (handwashing = less effective)

44 **1 SAFETY GOAL**

- Hand Hygiene
  - Calibrate staff: hand hygiene protocol
    - Technique
    - Hand care rules
      - Fingernails
      - Jewelry
  - Supplies & set-up
    - Products
    - Facility
  -
  -

45 **SKIN EXPOSURES**

- Non-intact skin may allow pathogens, irritants, allergens to enter
- Existing cuts / openings
- Dry, cracked skin

46 **HYPERSENSITIVITY / ALLERGY**

- Exaggerated immune response to an "enemy"
- Results in tissue destruction
- 4 types

47 **DERMATITIS VS. ALLERGIES**

- 30% of HCW's suffer

- Mostly irritant contact dermatitis
- Caused by
  - Detergents & water
  - Occlusive gloves (proteins, chemicals)
- Allergies are rare
-

48 **CONFUSING SYMPTOMS**

- Rash, welts,
- Urticaria (hives)
- Angioedema
- Puritis
-
-
-

49 **HAND HYGIENE**

- Why do we wash / sanitize every glove change?
  - Gloves fail
  - Organisms grow under gloves, doubling every 12 min.

50 **COMMON MISTAKES**
(THAT HARBOR ORGANISMS &
MAY DAMAGE GLOVES)

- False nails, Nail polish & applications
- Un-manicured nails
- Jewelry
- Petroleum-based products
- Bar soap

51 **DRUG RESISTANCE: CHALLENGES PROTOCOL & TX**

- Incidence linked to exposure, susceptibility & over-use of antibiotics
- MRSA = resistant to methicillin, penicillin, amoxicillin, cephalosporins)
- Dr.'s now use Clindamycin & Bactrim, Zyvox, incision / drainage
- Vancomycin may cause thrombocytopenia, hearing & kidney damage
-

52 **MRSA**
MULTI-DRUG RESISTANT STAPH. AUREUS

- Staph = common in flora of skin, nose, throat
- MRSA colonizes 1/3 of pop.
  - 64% more likely to die than non-colonized
  - Usually non or mildly infective
  - Unless enters bloodstream
  -
-

53 **MRSA ENTERS OPEN SKIN.**

PIMPLES, BOILS, LESIONS; MAY LEAD TO PNEUMONIA, SEVERE SKIN, BONE, BLOODSTREAM INFECTIONS, SEPTIC ARTHRITIS, ENDOCARDITIS, DEEP ABSCESSES, TOXIC SHOCK

54 ☐ **MRSA DEFEATS HOST DEFENSES**

Get a lab diagnosis early

55 ☐ **RESISTANT SKIN INFECTIONS….**
WHAT SHOULD YOU LOOK FOR?

56 ☐ **STAPH INFECTIONS**
(TATTOOS)

57 ☐ **TATTOO, PIERCING RISKS**

- Skin not cleaned
- Needle not clean / sterile
- Ink "double-dipped"
- Unhealed tattoo, piercing = portal of transmission / exposure

58 ☐

- Transmitted on towels, clothes, surfaces, equipment, skin-to-skin contact
- Enters broken skin
- May Cause FEVER
- Often undiagnosed - allowed to progress
- TX <u>may</u> be IV AB's, high $, side effects
- Follow CDC Recommendations – they work!
- Get a diagnosis!!!!
-
-

59 ☐ **WHAT'S THE POINT?**
DRUG RESISTANCE:

- Makes treatment less successful
- Increases importance of prevention
- Creates need for other strategies

60 ☐

Protect skin openings
Watch for symptoms
Clean environmental surfaces

61 ☐ **OCULAR HERPES**

62 ☐ **WHEN CAN YOU WEAR A FACE SHIELD WITHOUT A MASK?**

63 ☐ **ONLY FOR <u>NON</u>-DUST OR AEROSOL WORK**

64 ☐ **WEAR MASK UNDER FACE SHIELD FOR LAB WORK & PATIENT CARE**

65 ☐ **WHAT DO YOU NEED TO KNOW ABOUT EYEWASH STATIONS?**

- Location: within 15' or 10 seconds

- No hot water
- How to activate
- Eyewashes are flushed weekly
- When to use and when NOT to use eyewash stations
-

66 **MYOPIA: URBAN VISION**

- N. Amer. & Eur.: 1/3 adults = myopic
- U.S. myopia:1970: 25% 2000: 42%
- (too fast for genetic change)
- Seoul & Shanghai myopia: 95% students
- Eye shape = determined by
  - Genetics
  - Growth in infancy, adolescence
  - ***Daily behavior = most important!
  -
-

67 **URBAN MYOPIA**

- Singapore young men: 80% myopic
  - 1980: 43%
  - now: "epidemic"
- Myopia is not increasing in rural areas
- Myopia increases risk of:
  - Cataracts
  - Glaucoma
  - Detached retina
- So…Increase outside light exposure

68 **COMPUTER VISION SYNDROME**

- 70% of adults suffer digital eye strain
- Artificial blue light increases cataracts & macular degeneration
- Gunnar lenses filter blue light
- Crystalline: 10%
- Amber: 65%
- Outdoor: UVA, UVB

69 **GLOVES**

- How do they fit?
- Are you allergic or sensitive?
  - Latex?
  - Accelerators?
    - Thiuram
    - Carbamate

- Do you trust your gloves?
- 4% may leak

- Buy quality
-

70 **HOW LONG DO GLOVES LAST?**

2
- No exact data
- Change per patient & when compromised
- No longer than 1 hour
-

71 **2016 FDA BAN ON POWDERED GLOVES**

- Rule applies to:
  - All glove types
  - Exam & surgical gloves
  - Absorbable powder for lubricating surgical gloves
- Powder risks:
  - Increased aerosolized allergens (with latex gloves)
  - Severe airway inflammation
  - Surgical & wound inflammation & post-surgical adhesions

72 **RESPECT GLOVE LIMITS**
WHAT DESTROYS GLOVES?

73 **WHAT KILLS GLOVES?**

- Soap
- Water
- Oils – all types
  - Petroleum
  - Emollients in products
  - Make-up
- Sweat, dental materials
- Stretching, donning, removing
- Use!!!-

CDC MMWR 2003

74 **1 SAFETY GOAL**

- PPE: Gloves
  - Select for fit, reliability
  - Consider allergies
  - Know limits!
  -
  -

75 **AEROSOL-TRANSMITTED-DISEASES (ATD)**

3
- Inhalation of suspended particles
- Small fluid droplets dry in nano-seconds, float
- Particles remain indefinitely
- Require special building design & PPE for safety

- ATD patients must be screened and referred

76 **RESPIRATORS NEEDED TO TREAT ACTIVE CASES**

77 **AIRBORNE <u>DISEASES</u>**

- Measles, mumps
- Varicella (including disseminated zoster) ¥
- Tuberculosis ¥£ , Flu
-
-
-
-
-
-

¥ requires >1 precaution £ See CDC TB Guidelines

78 **SCREENING FOR ACTIVE CASES**
LOOK FOR SYMPTOMS

- Goals = reduce transmission by:
  - Early detection @ check-in
  - Prompt isolation
  - Implement respiratory hygiene / cough etiquette
  - Defer elective TX
  - Refer emergency / acute cases
    - For dental emergencies
    - For medical care
  - Implement appropriate precautions

79 **INFLUENZA**

- Highly infectious respiratory disease
- Epidemics since 1510
- Mild to severe, usually targets very young, elderly, weak
- All flu viruses originate in birds most stay there
-
-

80 **INFLUENZA**

Worldwide:

- 3-5 mil cases yearly
- 250 K – 500 K deaths/year
- Most resistant to oseltamivir & zanamivir
- Some resistant to Tamiflu
- Evolve resistance rapidly
-
- Vaccines!

•

81 **TODAY'S H3N2 INFLUENZA EPIDEMIC**

- Flu season = usually Oct. to May (early peak?)
- 42 deaths this season
- Children, elderly & pregnant women = highest risk
- Healthy getting seriously ill
- LLU seeing 60 more pts. / day than usual
- H3N2 = most virulent, other strains also seen
-

82 **LOMA LINDA UNIVERSITY FLU TENTS**

- Hospitals overflowing, setting up tents
- Canceling surgeries to handle crisis
- Flu vaccine ~ 30% effective, but it helps!

83 **FIND THE 1 INCORRECT SIGN OF INFLUENZA**

A. Abrupt onset
B. Extreme fatigue
C. Body aches
D. Subnormal temp.
E. Fever

84 **INFLUENZA SIGNS & SYMPTOMS**

- Fever & chills – sudden onset
- Cough
- Sore throat
- Intense body aches, skin sensitivity
- Headache
- Diarrhea, vomiting

85 **WHO SHOULD BE VACCINATED?**

- Everyone over 6 months old (CDC)
- Even those who had flu!
  - Confirmed previous cases: vaccine improves immunity
  - Suspected previous H1N1 cases: vaccinate
- HIGHLY recommended if:
  - have existing health problems
  - have contact with children under 5
  - healthcare professionals
  -

86

87 **MEASLES – STILL KILLING KIDS**

- Leading cause of death in children (worldwide)
- 10-12 day incubation

- High fever (1 wk), runny nose, cough, white spots in mouth: precede rash

88 **VIOLENT "PAROXYSMS"**

- Uncontrollable "100 day cough"
- Breaks ribs, causes vomiting, urination....
- Etiology: bacterium *Bordetella pertussis*
- Strips cilia, mucus stagnates, airways = raw, sensitive to touch, air, water...
- Confused with cold, symptoms build
- light fever

89 **SCARLET FEVER (SCARLATINA)**

- Caused by Gp A Streptococcus pyogenes (strep throat)
- Mostly children 5 – 15
- Antibiotics
- Untreated: may cause serious illness, rheumatic fever, kidney damage
- # of cases & deaths decreased since early 1900's
- Recent increase in cases. Cause unknown
- East Asia, England - @ 50 year high
- Droplet & contact transmission

90 **SCARLET FEVER**

- Red rash: looks like sunburn, feels like sandpaper
  - Begins on face, neck, spreads everywhere
  - Redness blanches
  - Later skin peels

91 **SCARLET FEVER**

- Red lines at skin folds
-

92 **SCARLET FEVER**

- Flushed face, pale ring around mouth

93 **SCARLET FEVER**

Strawberry tongue or coated

94 **SCARLET FEVER**

- Fever $\geq$ 101 degrees
- Lymphadenopathy
- Difficulty swallowing
- Nausea, vomiting
- Headache

95 **MAKE SURE YOU ARE PROTECTED!**

1 • HBV
- Influenza
- Measles
- Mumps

- Rubella
- Varicella-Zoster
- Pertussis
-
- www.CDC.gov: new adult vaccine recs
- OSHA policies:
  - New hires & employees
-
- Tetanus
- Polio
- Pneumonia
- Meningitis
- HPV

SEATING

- Automatic seat tilt:
  - Better circulation to legs
  - < back strain
  - Get close to patient
- Back support
  - Up & down
  - In & out
  - < back strain
  - Better posture
- 5 Casters
  -

TUBERCULOSIS POLICY

- MDR TB = worldwide risk
- Develop TB program appropriate to risk
- Tuberculin skin test (TST) when hired & per risk
- Ask all pts:
  - History of TB?
  - Symptoms of TB?

MYCOBACTERIUM TUBERCULOSIS

- Well controlled in U.S.
- World-wide: 9.6 mil. New cases - 2015
  - 1.5 mil. = fatal
  - 480,000 MDR TB cases
  - 100 countries reported XTR TB (extensively resistant)
  - India reported totally resistant cases
-

SCREEN FOR ACTIVE TB:

- Productive cough (> 3 weeks)
  - Bloody sputum

- Night sweats
- Fatigue
- Malaise
- Fever
- Unexplained weight loss
- If yes: medical referral, (reportable)

100 ☐ ***MYCOBACTERIUM TUBERCULOSIS***

- Mtb infection is NOT synonymous with ACTIVE TB!
- Positive skin test does NOT mean ACTIVE TB!

101 ☐ **HAVE YOU BEEN VACCINATED AGAINST TB?:**

- TB blood tests (interferon-gamma release assays or IGRAs), unlike the TB skin test are not affected by prior BCG vaccination
- Symptom tests
- ATD screening form
- Chest X-ray?

102 ☐ **TB, FLU & OTHER ATD'S**
ASK: DO YOU HAVE….

1 • TB
  - Fever, cough….
- Flu
  - Fever?
  - Body aches?
  - Runny nose?
  - Sore throat?
  - Headache?
  - Nausea?
  - Vomiting or diarrhea?
-

If yes, re-appoint, refer

-

2 • Pertussis, measles, mumps, rubella, chicken pox, meningitis
  - Fever, respiratory symptoms +
  - Severe coughing spasms
  - Painful, swollen glands
  - Skin rash, blisters
  - Stiff neck, mental changes

103 ☐ **CHRONIC RESPIRATORY DISEASES**
(NOT ATD'S, NO FEVER)

- Asthma
- Allergies
- Chronic upper airway cough syndrome "postnasal drip"
- Gastroesophageal reflux disease (GERD)

- Chronic obstructive pulmonary disease (COPD)
- Emphysema
- Bronchitis
- Dry cough from ACE inhibitors

104 ☐ **RESPIRATORY HYGIENE, COUGH ETIQUETTE POST SIGNS**

- Cover your cough (lists symptoms patients should report to staff)
- http://www.cdc.gov/ncidod/dhqp/pdf/Infdis/RespiratoryPoster.pdf
- Cover your cough instructions and fliers in several languages
- http://www.cdc.gov/flu/protect/covercough.htm

105 ☐ **DENTAL WORKER HEALTH**

- Symptomatic workers must be evaluated promptly
- No work until:
  - MD rules out ATD or
  - Worker is on therapy & is noninfectious

106 ☐ **5 SAFETY GOALS**

- Screen patients for active ATD's
  - Take temperatures
  - Know symptoms
- Notify patients & staff about ATD policy
- TB policy: test staff
- Respiratory hygiene, cough etiquette
- Vaccines

-

107 ☐ **PPE: SURGICAL MASKS**

- Designed to protect patient from:
  - Oral, nasal, respiratory tract flora
  - (Breathing, speaking 1-3 cfu / min)
- Masks are bi-directional barriers

108 ☐ **MASKS "SINGLE-USE, DISPOSABLE" CHANGE BETWEEN PATIENTS OR SOONER §1005 (B) (4)**

109 ☐ **IDENTIFY THE MASK YOU USE**

- ASTM level 1
- ASTM level 2
- ASTM level 3
- Don't know

110 ☐ **ASTM LEVELS**

111 ☐ **KNOW MASK LIMITS**

- Mask degrades from;
  - Perspiration

- Talking
- Sneezing
- Length of time mask is worn
- Dust, spray

- Shield may lengthen use-life
- Position mask to "stand out" from face
- 20 min - 1 hour!
-

112 ☐ **LASER RESPIRATORY PROTECTION**

- N95 / N100 respirators
- Or: full face shield & level 3 mask
- Facial fit = vital
- Fluid resistance
- Suction / filtration placed 1" from site
- Eye protection

113 ☐ **CLINIC ATTIRE**

- Protective attire
- Comply with OSHA regs
-

114 ☐ **2 SAFETY GOALS**

- PPE: Masks
  - Select appropriate ASTM levels
  - Use correctly
  - Avoid cross-contamination
  - Know limits!
- PPE = outer garment
- OSHA rules
  -
  -

115 ☐ **COVER OR REMOVE EXTRA ITEMS**

116 ☐ **SIMPLIFY SURFACES**

Environmental disinfection = cardinal feature in dentistry

117 ☐ **LOAD TRAYS OUTSIDE OPERATORY**

118 ☐ **WHAT IS YOUR PROTOCOL FOR RETRIEVING ITEMS DURING PROCEDURES?**

119 ☐ **BARRIERS PREVENT CONTAMINATION OF HARD-TO-CLEAN SURFACES**

120 ☐ **USE FDA CLEARED MEDICAL GRADE BARRIERS (TESTED FOR VIRAL & BACTERIAL PENETRATION)**

121 ☐ **DISINFECT WHEN CHANGE BARRIERS?**

122 **INTERMEDIATE LEVEL DISINFECTANTS KILL ALL BELOW:**

- Mycobacteria - *Mycobacterium tuberculosis*
- Nonlipid or small viruses (Non enveloped) - *Polio virus, enteroviruses*
- Fungi - *Trichophyton spp.*

(Low level hospital disinfectants kill only):

- Vegetative bacteria - *Pseudomonas aeruginosa, Staphylococcus aureus*
- Lipid (enveloped) or medium-sized viruses - *Herpes simplex virus, hepatitis A, B & C virus, HIV, Ebola* (CDC)

123 **FOLLOW LABEL DIRECTIONS**

- Clean before disinfecting
- Proteins neutralize disinfectants
- Wear Utility gloves

124 **ARE YOU CLEANING BEFORE DISINFECTING???**

It depends on technique
And product selection

125 **EFFECTS OF ALCOHOL CONCENTRATION**

126 **LEAVE FOR STATED TIME**

127 **DENTAL LAB ASEPSIS**

- Splash shields
- Fresh pumice
- Sterilized / new rag-wheels for EACH pt.
- Sterilize / discard equipment used on contaminated dental devices
- Clean & disinfect lab cases with intermediate-level disinfectant & rinse B4 placement in pt.

128 **1 SAFETY GOAL**

- Surface asepsis
  - Select product
  - Follow directions
  - Clean & disinfect
  - Barriers
  -
  -

129 **INSTRUMENT PROCESSING:**
HIGHEST LEVEL OF ASEPSIS

130 **INSTRUMENT PROCESSING**
"TRAFFIC FLOW"

131 **PRE-CLEANING / HOLDING**

132 **ENZYME PREVENTS DEBRIS ADHERENCE – AVOID SCRUBBING**

133 **ULTRASONIC CLEANING**
ALLOW BUBBLES TO WORK

134

135 **INSTRUMENT WASHERS**

-
- More efficient:
  - Space management
  - Instrument cleaning
  - Instrument management
-
-

136 **COMMON CLEANING ERRORS**

1 Ultrasonic

2
- Insufficient time
- Detergent concentration
- Ineffective cavitation
- Inappropriate temperature
- Overloading

3 Washer-Disinfector

4
- Wrong cycle ("rinse-hold")
- Inadequate water spray: spray impingement
- Clogged spray arms
- Pump/line clog or malfunction
- Overloading

137 **MONITORS HELP VISUALIZE SOIL REMOVAL**

NON-TOXIC <u>SYNTHETIC</u> BLOOD/DEBRIS

HOLDER ↓

138 **IF YOU DON'T CLEAN IT**
- You can't disinfect it
- You can't sterilize it

139 **DENTAL ADVISOR STUDY**
J. A. MOLINARI, P. NELSON (DENTAL ADVISOR, 2012)
- ~10% of used & sterilized metal tips showed microbial contamination
- Visual debris was found

140 **1 TOP SAFETY GOAL**
- Use single-use items correctly
-

141 **DOES YOUR OFFICE STERILIZE ALL MOTOR HANDPIECES AFTER EACH USE?**
A. Yes

B. No

142 **CDC:**

- Must heat sterilize ALL removable handpieces, even slow speeds
  - *electric handpieces: housing / sleeves = sterilizable, but micromotors may not be!

143 **WET WRAPS WICK & TEAR**

144 **VACUUM STERILIZER**

Single use water
Pre & post vacuum
Dry to dry time: 35-38 min.
Eliminates rust

145 **CASSETTES MUST BE WRAPPED UNLESS USED IMMEDIATELY**

146 **HOW FAST DO YOU NEED TO USE A FLASH-STERILIZED INSTRUMENT?**

147 **STERILIZER MONITORING**

- Old: Indicators: per package
  - Heat
- New: Class 5 indicators: per load / package
  - Time, temperature, pressure
- Biological Monitors: weekly
  - Non - pathogenic spores
- Keep logs & written reports

148 **2 STERILIZATION LOGS**

- 1: Log of each cycle for each sterilizer
  - Class 5 Indicator strip results
    - Sterilizer
    - Date
    - Indicator pass/fail
    - Initial
  - Machine print-out
    -
- 2: Biological test results

149 **CHEMICAL INDICATORS**

CLASS 5 **CLASS 4**

150 **ARE YOU LABELING STERILIZATION PACKAGES?**

A. Yes
B. No
C. Only surgical packages
D. Only implantable devices
E.
E.

* Sharpee industrial permanent markers withstand 500 degrees

151 **WHY LABEL PACKAGES?**

A. To re-sterilize after 3 months
B. To identify date of sterilization in case of (+) growth spore test
C. To identify person sterilizing items

152 **5 TOP SAFETY GOALS**

- Organize sterilization pathway
- Instrument cassettes
- Instrument washer
- Monitor cleaning
- Use class V indicators
- Keep logs
  -
  -

153

154 **DUWL MICROBES**

1
- Pseudomonas sp.
- Pasteurella sp.
- Micrococcus sp.
- Klebsiella
- Legionella sp.
- Mycobacterium sp.
- Enterococcus sp.

2
- Actinomyces
- Salmonella
- Strep. ,Staph.
- Bacteroides
- E. coli
- Nematodes
- Protozoa, amoebas
- Fungi (Candida, Aspergillus sp.

155 **ASSOCIATED ILLNESSES**

- Head, neck, dental infections
- Septicemia
- HCA surgical infections
- Pneumonia, Bronchitis
- Legionellosis
- Abscesses
- Appendicitis
- Salmonella poisoning
- Cryptosporidiosis

156 **DUWL – RELATED DEATH (2011)**

LANCET

- 82-yr old Italian Woman
- Legionnaires' dis (*L. pneumophila*)
- Proven from dentist's waterlines
- No other exposures
-

157 **2015 *MYCOBACTERIUM ABSCESSUS***
INFECTIONS - GEORGIA

- 9 pediatric infections confirmed after pulpotomies
- All pts were immunocompetent
- No deaths; hospitalizations, IV antibiotics, surgeries
- Dept. of Health notified Atlanta Dentists:
  - Follow DUWL disinfection protocol
  - Meet DUWL potable & surgical standards
  - Monitor DUWL
  - Promptly report suspected outbreaks

158 **2016 *MYCOBACTERIUM ABSCESSUS***
INFECTIONS - CALIFORNIA

- 30 pediatric infections confirmed after pulpotomies, children hospitalized
  - Symptoms start 15 – 85 days after TX.
  - TX = long term hospitalization, IV antibiotics
  - >500 patients notified
  - May – Sept, 2016, Children's Dental Clinic, OC
- *M. abscessus* = waterborne
- Dentist ordered to stop using water (9/15/16)
  -
-

159 **N. A. MORALES, AFTER 1 MO. HOSPITALIZATION**

160 **2016 *MYCOBACTERIUM ABSCESSUS***
INFECTIONS - CALIFORNIA

- Pulpotomies must include pulp area "sterilization"
- And/or sterile standard
- Health Dept. ordered office to cease use of & replace on-site water system
- All DUWL must be tested
  - www.ochealthinfo.com/dentaloutbreak
-

161 **2 STANDARDS FOR WATER SAFETY**

- Sterile - for surgery, (cutting bone, normally sterile tissue)
  - 0 CFU/mL of heterotrophic water bacteria
  - CDC special update, OSAP, Dental Board law
- Potable - for non- surgical procedures -
  - 500 CFU/mL of heterotrophic water bacteria (meets EPA safe drinking water standards)

- CDC, OSAP, EPA, Dental Board

162 **2 STANDARDS FOR DENTAL TREATMENT WATER**

- Surgical Standard: USP sterile water & sterile delivery system
  - Bulb or other syringe
  - Peristaltic pump, sterile lines
  - Aqua-Sept
- Non-surgical dentistry: Potable (500 CFU/mL)
  - Chemical treatment
    - Reservoirs
    - Cartridges
  -

163 **WHEN DOING SURGICAL PROCEDURES, DO YOU USE .....**

Sterile water & sterile separate delivery device?

164 **FOR POTABLE WATER YOUR OFFICE SHOULD:**

A. Flush lines in AM & PM for 2 min./line
B. Flush lines between patients for 20 sec.
C. Purge lines weekly if using only water in bottles.
D. Purge lines @ 1 – 2 months if using disinfecting product in dental water

165 **WATERLINE TREATMENT OPTIONS**

- Chemical "Shock" - removes biofilm
  - Sterilex, bleach
  - Caustic, may injure tissue. Rinse !
- Continuous chemical "maintenance" - prevents biofilm, keeps CFU's low.
  - DentaPure 1 /year (dry bottle at night)
  - BluTab (Silver ions) – ProEdge (keep bottle on)
  - ICX (Silver ions) – Adec
  - Team Vista - HuFriedy

166 **HOW DO YOU KNOW YOUR WATERLINES ARE SAFE?**

167 **YOU CAN DO IT!**

168 **TREAT, SHOCK, AND TEST ALL WATERLINES**

169 **4 TOP SAFETY GOALS**

- Insure sterile water for surgeries
- Insure potable standard for non-surgeries
- Control waterline contamination
- Monitor waterline safety
-

170 **MEASURING RISK: DOSIMETERS**

171 **X-RAY DOSIMETERS – FIXED EQUIPMENT**

- Dosimeters not required with mounted units, BUT:
- Must prove each employee has $\leq$ 10% of 5 rems annual exposure.
- Use dosimeters periodically (1 year on, 2 years off…)
- Monitor with ANY new equipment
- Pregnant employees must wear dosimeters - entire pregnancy (as long as employer knows)

172 **X-RAY DOSIMETERS – PORTABLE EQUIPMENT**

- MUST wear dosimeters with portable x-ray systems
- Evaluate dosimeters monthly
- Records must be available to Dept. of Public Health
-
-
-

173 **PROBLEM AREAS – THEY'RE ALL CONNECTED!**

- Hands, arms
- Shoulders
- Necks
- Backs
  -

174 **HANDS & ARMS**

175 **CUMULATIVE TRAUMA DISORDERS (CTD'S)**

- Musculoskeletal disorders
- Repetitive use injuries to:
  - Tendons, tendon sheaths
  - Bones
  - Muscles
  - Nerves
- Dentistry: upper extremity CTD's = most common

176 **CAUSES OF MEDIAN NERVE SYMPTOMS**

- Cervical alignment, pathology
- Median nerve impingement, compression, entrapment along length of nerve
- Thoracic outlet syndrome
- Carpal tunnel syndrome

177 **CARPAL TUNNEL SYNDROME**

178 **WHO HAS SYMPTOMS OF CARPAL TUNNEL SYNDROME?**

179 **THE NATURE OF CARPAL TUNNEL SYNDROME**

- Anatomy
  - Narrow, unyielding carpal tunnel contains:
    - Median nerve
    - 9 flexor tendons
    - Blood vessels

- Swelling, inflammation causes compression within tunnel

180 **CARPAL TUNNEL SYMPTOMS**

- Hand, wrist numbness, first noticed at night
- Thumb, forefinger, part of middle finger (NOT little finger!)
- Progresses to weakness, pain, swelling – may manifest in forearm
- IF prolonged: loss of motor control of areas innervated by median nerve: clumsiness, burning
- Nerve compression progresses from outer (sensory) to inner (motor) nerve fibers

181 **TENOSYNOVIUM THICKENING**

Irritation or inflammation → ischemia,
> Time > permanent damage

182 **THENAR MUSCLE LOSS**

Weakness, atrophy

183 **CTS IS MORE LIKELY WITH:**

- Wrist injury
- Arthritis
- Pregnancy
- Diabetic neuropathy
- Hypothyroidism
- Smoking
- Obesity
- Caffeine intake

184 **CTS WORK RISKS**

- Force
- Posture
- Wrist alignment
- Repetition
- Temperature
- Vibration

185 **NON- SURGICAL TREATMENT**

1
- Anti-inflammatory meds
- Oral steroids
- Vit. B-6
- Exercises

2
- Remove traumatic activity
- Alter habits
- Treat medical conditions

186 **CTS SURGERY**

- Open release
- Endoscopic release

187 **HOW RHEUMATOID ARTHRITIS DIFFERS FROM OSTEOARTHRITIS**

- RA = autoimmune disease, can start at any age (juvenile RA if earlier than 16 years)
- OA = age related

188 **OSTEOARTHRITIS**

189 **THE PAIN**

- OA: over time cartilage wears away (bone - on – bone)
-
- RA: immune cells target (attack) synovium (joint's lining)

190 **RA SYSTEMIC CASCADE**

- Immune process causes fever, swelling, & other symptoms not seen in osteoarthritis.
- RA inflammation can cause heart, lung, eye damage.
- 3 X more likely in women

191 **JOINT DEFORMITIES**

2 • RA: severe joint deformities = more common, eventually lead to joint erosion, displacement
  - Hands: ulnar finger deviation

3 • OA: Joint enlargement
- Painful bony lumps & spurs in joints:
  - fingers, shoulders, elbows, hips, knees, ankles
-

192 **NODULES**

RA **OA**

1 • ~20 – 30% of RA pts: firm nodules under skin (often elbows)
- Sign of more severe disease

2 • OA: Heberden's nodules
- Hard, bony

193 **RA & YOUR WRISTS**

- Joint Inflammation causes pressure neuropathy
- Numbness
- Tingling
- Weakness
- Sharp arm pain

194 **RA: NUMBNESS / TINGLING IN HANDS**

- Carpal tunnel syndrome
- Ulnar nerve neuropathy
- RA may be the cause, or present with CTS

195 **WHAT HELPS JOINT PAIN?**

- EARLY treatment with meds to quiet immune system;
  - chemotherapy
  - anti-rheumatic,
  - anti-inflammatory

196 **SHOULDER ANATOMY**

- Improper scapular movement leads to shoulder pathology
  - Muscles hold bones in alignment

(normal scapular plane shown)

197 **SHOULDER LIGAMENTS**

- Connect bones to bones
- Main source of shoulder stability
  - Prevent dislocation
- Joint capsule is watertight sac around joint formed by capsular ligaments

198 **BURSA**

Fluid-filled sacs (lubricant)

•

199 **ROTATOR CUFF**

- Capsule where head of humerus sits
- 4 major muscles stabilize rotator cuff, hold humerus in glenoid fossa
- Tendons attach muscles to bones
•

200 **CROSSOVER SYMMETRY**
HTTPS://CROSSOVERSYMMETRY.COM/TRAINING-ZONE/

201 **NERVES**

- All hand and arm nerves travel through axilla (armpit)
  - Radial, Ulnar, Median
- Sensory: pain, temperature, proprioception
- Motor: movement, muscle stimulation
- Blood vessels follow nerves

202 **BRACHIAL PLEXUS IMPINGEMENT**

- Neurovascular bundle:
  - Brachial plexus (network of motor & sensory nerves innervating arm, hand, shoulder
  - C8 & T1 nerve roots
  - Subclavian artery & vein
•

203 **THORACIC OUTLET SYNDROME (TOS)**

- Group of disorders
- Nerve & vascular compression

204 **TOS SIGNS**

- Anterior scalene (tightness, pain)
- Costoclavicular approximation
  - Clavical changes position
- Pectoralis minor tightness

205 ☐ **TOS SYMPTOMS**

- Pain, numbness, weakness, tingling in neck, shoulder, face, head
  - Clavicle, shoulder, inside arm, hand: ring & pinky
  - Symptoms worsen with use, arms lifted
- TMD, migraines
- Vascular symptoms = serious!
  - Arm, shoulder = heavy, cold, blue, swollen
-

206 ☐ **CAUSES OF TOS**

- Sustained static postures
- Drooping shoulders / forward head posture
  - Osteoporosis
- Carrying heavy loads
  - Luggage, briefcases, shoulder bags
- Repetitive over-head arm movement
- Extra rib
- Car accidents
  - Seat belts

207 ☐ **TOS IS DIFFICULT TO DIAGNOSE**

- Confused with: (other disorders)
  - CTS (hand), cervical spine dis. (neck), nerve root compression (spine), tumors, bursitis (shoulder)
-

208 ☐ **ULNAR NERVE NEUROPATHY**

- Dysfunction affects distal 21/2 fingers
- Caused by: injury, entrapment, compression
- Symptoms: pain, weakness

209 ☐ **TOP (GENERAL) SAFETY GOALS**

- Written Safety Program
- Safety Manager
- Recognize & Understand Risks
- Implement Standard Precautions
- Plan for exceptions and accidents
-

210 ☐ **TOP 13 SAFETY GOALS**

1. Written Safety Program
   - OSHA manual – personalize & update it
   - Enforce it
   - IC laws
   - Download CDC recommendations!
   - Instructions for use, operation manuals….
2. Safety Manager

3. Recognize & Understand Risks

211 **TOP 13 SAFETY GOALS**

4. Hand Hygiene
   - Calibrate staff
     - Technique
     - Hand care rules
   - Supplies & set-up
     - Products
     - Facility
- 5. Surface asepsis
   - Follow directions
   - Clean & disinfect
   - Barriers
   -

212 **TOP 13 SAFETY GOAL**

6. PPE – Use correctly & respect their limits
- Gloves
   - Select for fit, reliability
   - Change 20 min – 1 hr.
- Masks
   - Select appropriate ASTM levels
   - Avoid cross-contamination
   - Change 20 min – 1 hr.
   -
   -

213 **TOP 13 SAFETY GOALS**

7. Vaccines
   - Educate staff (CDC.gov)
8. Sharps safety
   - Handling & waste
9. Instrument sterilization
   - Organize sterilization pathway
   - Instrument cassettes
   - Instrument washer
   - Monitor cleaning
   - Use class 5 indicators
   - Keep logs
   -
   -

214 **TOP 13 SAFETY GOALS**

10. Dental waterline management

- Insure sterile water for surgeries
- Insure potable standard for non-surgeries
- Control waterline contamination
- Monitor waterline safety
-

215 **TOP 13 SAFETY GOALS**

11. Screen patients for active ATD's
    - Take temperatures
    - Know symptoms
- Notify patients & staff about ATD policy
- TB policy: test staff
- Respiratory hygiene, cough etiquette

    -

216 **TOP 13 SAFETY GOALS**

12. PEP "Plan B"
    - Exposure incident package
    - Records
    - Follow-up
    - Stay alert for extraordinary cases
    -
-

217 **TOP 13 SAFETY GOALS**

13.Ergonomics
- Hands & wrists; gloves & positioning
- Sitting & chairs
- Arms & shoulders
- Breaks & stretching
- Be aware
    -
-

218 **IS THERE A CULTURE OF SAFETY WHERE YOU WORK?**

- Action list?
- Is your team know what you know?
- How do patients view your office?
- Make every patient visit the safest visit!

219 **WHAT YOU DO OVER & OVER**

220 **TEAMWORK!**