

## 1 **STANDING UP TO EMERGING DISEASES**

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## 2 **EMERGING DISEASES**

- Disease transmission & Infection Control
- Drug resistance
- Bloodborne diseases
- Vector-borne diseases
- Airborne diseases
- Biofilm diseases
- Standard vs. transmission-based precautions
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## 3 **A BRIEF HISTORY**

- 1928 – Fleming discovered penicillin mold.
- By D-day, penicillin was mass-produced to fight staphylococcus (pneumonia, skin infections, food poisoning)
- > 100 antibiotics now used, but no new ab's since 1987
- Over-use of antibiotics & treating livestock has increased microbial resistance & drug allergies
- In U.S. >23,000 deaths / year caused by MDR pathogens
- Tetracycline, erythromycin, vancomycin = often ineffective

## 4 **A BRIEF HISTORY**

- Colistin = last resort antibiotic (toxic side-effects)
- Now colistin-resistant pathogens
- WHO:
  - Gonorrhea “may soon be untreatable” due to resistance to ceftriaxone (cephalosporin class)
  - Extensively drug-resistant TB is in 100 countries
  - World-wide resistance to carbapenem antibiotics prevents TX. of deadly intestinal enterobacteriaceae
- All surgeries; implants, transplants, cancer treatment..... Rely on antibiotics

## 5 **EMERGING DISEASES**

- Last 20 years: global pandemics
  - Influenza & SARS – Asia, Canada, Ebola – West Africa, Zika virus – Americas, Yellow fever – Angola, many MDR pathogens,
  - Superbug mcr-1 gene in microbes (in humans & pigs, 2016)
  - Polio – Nigeria, 2016
  - TB – Cambodia, 2017

## 6 **MICROBIAL EMERGENCE FACTORS**

- Increased urban populations
  - Rapid, unplanned city growth
  - Crowded, poor sanitation & healthcare

- Easy transmission
- Global demand for meat
  - Industrial farming: microbes become pathogens
  - Use of colistin in livestock in China    mcr-1 gene
  - Livestock near wild birds    largest influenza pandemic in history
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#### 7 **MICROBIAL EMERGENCE FACTORS**

- Thicker blanket of carbon dioxide allows insects and other vectors to enter new locations
  - Mosquitos & ticks, bats (vectors, reservoirs)

#### 8 **YOU ARE MICROBIAL!**

- Microbiome: "collection of bacteria, fungi & other single-celled organisms"
- You have 10 X more bacterial cells than human
- 400 X more microbial genes than human
- Most microbes are biofilm dwellers
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#### 9 **YOUR MICROBIAL SELF**

- Most are friendly & vital to:
  - Digest food
  - Metabolize drugs
  - Maintain health, balance
  - Protect against pathogens (imbalance)
- Disruptions in microbiota = related to:
  - Inflammatory bowel disease
  - Vaginal & bladder infections
  - Periodontal disease
  - Obesity (adenovirus-36 infection causes stem cells to become adipocytes)

#### 10 **VIROME**

- You have 10 X more viruses than bacteria?
- Viruses = genetic material + protein shell
- Need cells to live & replicate
- Become part of host, cause disease, protect
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#### 11 **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

## 12 **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

## 13 **RESOURCES**

- Join osap [www.osap.org](http://www.osap.org)
  - Organization for Safety, Asepsis and Prevention
- State Dental Board, ADA, NY Dental Assoc.
  - The New York State Dental Association: 518-465-0044
  - 20 Corporate Woods Blvd. #602
  - Albany, New York 12211
- OSHA
  - Albany Area Office: (518) 464-4338
  - 401 New Karner Road, Ste 300
  - Albany, New York 12205-3809

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## 14 **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

## 15 **NEW CDC RECOMMENDATIONS**

<http://www.cdc.gov/OralHealth/infectioncontrol/guidelines/index.htm>

Checklists!

To be used along with 2003 Infection Control Recommendations

## 16 **CHAIN OF**

**INFECTION**17  **BREAKING  
THE CHAIN**18  **IC 101**

- Isolate & separate
- Cleaning before disinfection / sterilization
- How do microbes die?
  - Heat (how hot? How cold?)
  - Chemicals (Which ones? What concentrations? How toxic?)
  - Is resistance likely?
- Is IC safe enough for you?
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19  **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

20  **STANDARD PRECAUTIONS**

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

21  **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
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22  **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
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MRSA enters open skin.

Pimples, boils, lesions; may lead to pneumonia, severe skin, bone, bloodstream infections, septic arthritis, endocarditis, deep abscesses, toxic shock

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- Transmitted on towels, clothes, surfaces, equipment, skin-to-skin contact
- Enters broken skin
- May Cause FEVER
- Often undiagnosed - allowed to progress
- TX may be IV AB's, high \$, side effects
- Follow CDC Recommendations – they work!
- Get a diagnosis!!!!
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25  **E. COLI & SALMONELLA OUTBREAKS –DISTANT DISTRIBUTION & RESTAURANTS**

- Fecal contamination from food handlers' hands?
- Fields – to - table
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- MDR organisms increase risk

26  **MDR ESCHERICHIA COLI**

- Contains mcr-1 gene, resists colistin (antibiotic of last resort)
- Mcr-1 = on mobile DNA, shared between many bacterial types
- Results of transient gut colonization:
  - If healthy: asymptomatic unless enter blood
  - Immunocompromised: diarrheal disease
- Mcr-1 gene spreading: Humans in Europe, Asia, Africa, S. America, U.S.
- Found in pig guts in U.S.

27  **MDR KLEBSIELLA**

- Klebsiella = normal intestinal flora
- May cause pneumonia, meningitis, blood infections
- Carbapenem resistant
- Risk for exposure: hospitalization
  - IV catheter
  - Ventilator
  - Long course antibiotics
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28  **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

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### 29 **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

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- Vaccines!

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### 30 **SALMONELLA TYPHI**

Worldwide:

- Typhoid fever affects 21 mil. / yr
- 222 K deaths / yr - mostly children

U.S.:

- 5 K cases/yr (ingested abroad: food, water)
- Developing resistance
- Vaccines!

### 31 **PSEUDOMONAS AERUGINOSA**

- 51,000 healthcare-assoc. Infections / yr
  - 6,000 cases = MDR
  - 400 deaths / yr
- Risks: breathing machines, catheters, wounds

### 32 **MDR-CAMPYLOBACTER**

Food poisoning diarrhea

### 33 **MDR STREPTOCOCCUS PNEUMONIAE**

- Pneumonia
- Meningitis

### 34 **MDR GONORRHEA**

#### **U.S. CASES RISING SINCE 2009**

- Highly resistant strains becoming more prevalent
- 63% increase last 5 yrs (Australia), higher in U.S. ~ 800K new cases/yr BUT ~ ½ are reported
- 75% cases = male
- Mostly 15 – 29 YO – but all ages
- Mostly urban trend

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### 35 **MDR GONORRHEA**

### U.S. CASES RISING SINCE 2009

- Reasons? lower condom usage or new strains?
- 80% females & 50% males = asymptomatic
- Left untreated: sterility, PID, ectopic pregnancies
- Need vaccine!
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### 36 VACCINE SURPRISE

- Vaccine vs. Bacterial meningitis (*Neisseria meningitidis* bacteria, New Zealand) protected vs. Gonorrhea (*Neisseria gonorrhoeae* bacteria).
  - Vaccine reduced Gonorrhea 31%
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### 37 WHAT'S THE POINT? DRUG RESISTANCE:

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

### 38 A SOLUTION! GENETIC RE-PROGRAMMING OF STAPHYLOCOCCUS AUREUS

- *S. aureus* turns on *fmtC* gene in biofilm
- *fmtC* causes resistance
- Chemicals & drugs can turn it off!
- Coming soon
- <http://www.msnbc.com/news/858649.asp#BODY>

### 39 TEIXOBACTIN (HUMAN TRIALS PENDING)

- Made by bacteria, kills wide range of resistant bacteria
- Prevents cell wall construction (holes in cell wall)
- Effective vs:
  - TB, Septicemia, *Clostridium difficile colitis* (*C. dif*)
  - *Staphylococcus aureus* (Staph infection) and *Streptococcus pneumoniae* (Strep throat) (no side effects! Useful for orthopedic surgeries)
  - MRSA (100 X more effective than Vancomycin)
- NOT effective for gm (-) bacteria: *Klebsiella*, *E. coli* and *Pseudomonas*
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### 40 MIXED BIOFILM ZONES (MICRO-ENVIRONMENTS)

- Commensal behavior
- Aerobic cells require O<sub>2</sub> & nutrients
  - Substrate
  - Flowing fluids

- Anaerobes - below aerobes
- Cells live off waste & byproducts of other biofilm species
- Many spp. = viable but non-culturable: undetectable by tests used

#### 41 **MECHANISMS OF BIOFILM PROTECTION**

- Antimicrobial depletion / neutralization b4 reaching bacteria (outer layers absorb)
- Slow penetration of agent: cells have time to initiate stress response
- Stress response: cells change activity
- Cell groups inactivate, but viable  
persister cells (spore-like) survive

#### 42 **BIOFILM INFECTIONS**

- Dental caries, periodontitis Strep., gm (-) anaerobes
- Otitis Media H. Influenzae
- Musculoskeletal infections staph.
- Necrotizing fasciitis Gp. A strep.
- Biliary tract infections E. coli
- Osteomyelitis mixed bact., fungal species.
- Infective endocarditis previously: Viridans gp. Strep., now  
staph & candida
- Cystic fibrosis pneumonia P. Aeruginosa,  
`Burkholderia cepacia.

Science Vol 284 21 may 1999

#### 43 **PERIO - CARDIOVASCULAR DIS.**

- Inflammation is important in both
- Porphyromonas gingivalis & Strep. sanguis specifically ID'd
- Severe periodontitis = ~ 9 inches chronic open wound → Bacteremia
- P.D. = biofilm disease
- P.D. – source for implant infections

#### 44 **BIOFILM & INFLAMMATION WARS**

- PD = superficial disease, highly accessible
- Deeper tissue biofilms = hidden
- Inflammation: standoff between phagocytes & bacteria
  - Phagocytes can't engulf biofilm – shoot enzymes at it
  - Causes general destruction (collateral damage)
  - Fails to penetrate biofilm
  - Inflammatory response to biofilm infections = heightened

#### 45 **HEALTH CARE ASSOCIATED BIOFILM INFECTIONS**

- 1 • Hospital Pneumonia
- Sutures, exit sites
- Arteriovenous shunts
- Contact lenses



- Urinary catheter cystitis
- Peritonitis
- IUD's
- Endotracheal tubes
- 2 • Catheters
- Mechanical heart valves
- Vascular grafts
- Orthopedic devices
- Prostheses
- 0% success w. Anti-biotics alone (must remove)

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#### 46 **BIOFILM DISEASES**

- Cystic fibrosis: pseudomonas & mucus
- Native valve endocarditis
  - Biofilm "vegetation" (high concentrations of antibiotics can cure in 6 weeks)
- Osteomyelitis
- Toxic shock – vaginal biofilms, tampons (staph)
  - Diagnosis = difficult
  - Cultures only grow when biofilm sheds!
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#### 47 **OSTEONECROSIS OF THE JAW**

- Bisphosphonates change binding of bacteria to hydroxyapatite of bone
- Bone = replaced with biofilm
- \*\*\*If bacteria get access to bone & bone has bisphosphonate in it → necrosis

#### 48 **BIOFILMS IN CHRONIC WOUNDS**

- 60% chronic wounds have biofilms
- Poorly revealed with cultures
- 2 - 15 species present
  - Fusobacterium, bacillus, actinomyces, staph, strep, selenomonas, candida, 3 types of treponemes
  - No viruses addressed!
- Biofilms prevent healing
- Diabetic, venous, pressure ulcers

#### 49

- E. coli most common
- 75% of other infections = Pseudomonas aeruginosa
- 25% of other infections = Legionella
- Heat dissipates disinfectants

#### 50 **LYME DISEASE**

- Ticks carry Borrelia burgdorferi
- Chronic biofilm disease
- Borrelia forms:

- Cystic form
- Pleomorphic
- Granules
- Spirochetes
- Found in biofilms in joints, brain,
- Dementia, mental illness
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#### 51 **SIGNALING**

- Bacteria communicate chemically within biofilm (hormone-like signals)
- Allows biofilm to act collectively as a single force:
  - Aggregate
  - Swarm
  - Disperse
  - Secrete
  - Absorb
  - Replicate
  - Change cell phase (spore, dormant...)

#### 52 **SIGNALING**

- Signals in nature:
  - Some plants (marine) have biofilm inhibitors
    - Red algae
  - Orchids in jungle have 8 biofilm inhibitors
- Goal: manipulate signaling to:
  - Prevent formation
  - Slow growth
  - Trigger detachment (swim away)
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#### 53 **SIGNALING CHALLENGES**

- Preventing signaling to beneficial bacteria and biofilms
- Keeping signal localized on target
- Bacteria use electrical charges, along nano-wire network within biofilm
- Maybe: disrupt biofilm communication through power grid

#### 54 **BIOFILM RESEARCH**

- Probiotics: designing the "optimal" protective biofilms
  - May be different for different people
- Controlling inflammation

#### 55 **WILL BIOFILMS SAVE EARTH?**

- "Slime curtains" can isolate & separate toxic areas; protect ground water, streams, rivers
- Biofilm layer can prevent penetration of acid water drainage into under ground aquifers
- Engineered biofilms can metabolize toxins, accelerate bio-degradation of wastes
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#### 56 **BIOFILM GENETIC ENGINEERING**

- Drugs & drug delivery
- Environmental clean-up
- Toxic containment
- Bio-degradation
- Antimicrobial surfaces
- Pro-biotics
- Alternative fuels
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57  **BIOFILM PROPERTY      CLINICAL IMPLICATIONS**

- 1 • Behaves as primitive multi-cellular organism

- Formation is orderly
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- Cell- to - cell communication required
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- 2 • Target weak links

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- Target early steps
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- Find antagonists to intercept, or control signals

58  **BIOFILM PROPERTY      CLINICAL IMPLICATIONS**

- 1 • Biofilms resist host immune responses & antimicrobials

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- Biofilm phenotype different from planktonic
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- Biofilms use & respond to electrical signals
- 
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- No one method found successful

- 2 • Target and remove protective matrix + symbiotic species

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- Target correct phenotypes
- 
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- Use electric currents to weaken / disrupt microbes in biofilms, then use antibiotics, antimicrobials
-

- Combine physical, chemical and signaling strategies

#### 59 **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.)

#### 60 **ASSOCIATED ILLNESSES**

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

#### 61 **LEGIONELLA PROTECTED INSIDE ACANTHAMOEBA: TWO FORMS**

#### 62 **DUWL – RELATED DEATH (2011) LANCET**

- 82-yr old Italian Woman
- Legionnaires' dis (*L. pneumophila*)
- Proven from dentist's waterlines
- No other exposures
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#### 63 **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

64  **2016 MYCOBACTERIUM ABSCESSUS INFECTIONS - CALIFORNIA**

- 57 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
- Health Dept. ordered office to cease use of & replace on-site water system
- Office closed, opened, problem returned – closed again
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65  **N. A. MORALES, AFTER 1 MO. HOSPITALIZATION**

66  **2016 MYCOBACTERIUM ABSCESSUS INFECTIONS - CALIFORNIA**

- Pulpotomies must include pulp area “sterilization”
- Potable/or sterile standard
- Structural, plumbing, equipment, antimicrobial & protocol revisions required. Must maintain @ 500 CFU/mL (CDB, CDA, CDC)
- All DUWL should be tested to validate
  - [www.ochealthinfo.com/dentaloutbreak](http://www.ochealthinfo.com/dentaloutbreak)
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67  **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

68  **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

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

Sterile water & sterile separate delivery device?

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

- A. Flush lines in AM for 2 min./line (handpieces off)
- B. Flush lines between patients for 20 sec.
- C. Shock/Purge lines @ 1 – 2 months if using disinfecting product in dental water
- D.
- D. Shock/Purge lines weekly if using only water in bottles.
- E. Follow Manufacturer's directions (dental unit & DUW product)
- F.

71  **SIMPLE FLUSHING OF WATERLINES**

\* Flushing is important: flushing removes planktonic contaminants  
BUT: flushing alone is NOT a reliable way to control DUWL biofilms.

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72  **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

73  **DENTISTRY AFTER  
BOIL-WATER ADVISORIES**

- Do not deliver public water to patients through dental unit, ultrasonic scaler, or any dental equipment.
- Do not use public water for dental treatment, patient rinsing, or handwashing
- Use antimicrobial waterless hand sanitizers (alcohol rubs)
- Wash soiled hands with bottled water or antiseptic towelette

CDC

74  **AFTER BOIL-WATER ADVISORIES**

- Follow local water utility guidance re: flushing all waterlines
- If no guidance is given: flush waterlines and faucets for 1 - 5 minutes prior to patient care
- Disinfect dental waterlines as recommended by unit manufacturer

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

- Loma Linda University Waterline Testing
- ProEdge Waterline Testing

76  **TREATING PATIENTS:  
MOST LIKELY DENTAL EXPOSURES**

- Percutaneous
  - Needles
  - Burs
  - Instruments, files
- Compromised skin
- Mucosal exposure
- HBV = efficiently transmitted directly & indirectly (survives on surfaces – 7 days)

77  **RISK OF INFECTION AFTER NEEDLESTICK**

1 Source

HBV (+) .....  
HCV (+) .....  
HIV (+) .....

2 Risk

6.0-30.0%  
1.8%  
0.3%

78  **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

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

79  **HBV BOOSTERS & TREATMENT**

Boosters?

- Vaccine gives immunologic memory  $\geq$  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

80  **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

### 81 **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 →

### 82 **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

### 83 **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% (lower viral load)
- 20% of infected = unaware of status
- Early TX saves lives!
- Education is the key!
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### 84 **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.

### 85 **HTLV-1 HUMAN T-CELL LEUKEMIA VIRUS**

- "cousin of HIV"



- Ancient virus (found in 1500 YO Andean mummies)
- Causes leukemia, lymphoma, diseases of NS, bronchiectasis (lung disease) weakens immune system
- Global virus,
- large cluster in central Australia (> 40% of indigenous pop.)
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#### 86 HTLV-1

##### **HUMAN T-CELL LEUKEMIA VIRUS**

- ID'd 1979 ~ same time as HIV
- Transmission:
  - Sex
  - Birth, breastfeeding
  - Blood, transfusions, organ transplants
- Only Japan tests babies for HTLV-1
- Donated tissues & blood often tested in U.S., Australia, few other countries
- No vaccine, little research
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#### 87 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
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#### 88 ARE YOU SET UP?

- National Clinicians' PEP Hotline
- 1-888-448-4911
- Call 24/7

#### 89 VECTOR-BORNE DISEASES

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

#### 90 MOSQUITO – WATER LINKS

- Emergence of year around biting mosquitoes
- West Nile - Spread to 47 states in 5 yrs
  - ~20% - flu-like symptoms

- ~1% encephalitis or neurological symptoms
- Spread by ticks and mosquitos
- Dengue (Bone-Break Fever) rivals Malaria
  - Endemic in tropical destinations
  - Outbreaks in Puerto Rico, S. Amer.

#### 91 **AEDES AEGYPTI MOSQUITOS**

- Aedes aegypti mosquito
- City dweller, loves humans
- Can breed in a capful of water
- Serial biter - rapid spread of pathogens if infected
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#### 92 **MALARIA (PLASMODIUM PARASITE)**

- Rampant in US until WW 2
- Globally: 1.5 - 3 mil deaths / year ,
  - 80% in Africa, > 1 mil/yr are children
- Present vaccine = 33% effective & costly
- New vaccines being tested
- Asian Tiger mosquito                      invading U. S. (tires)
- Bloodborne disease

#### 93 **DENGUE "BONE-BREAK FEVER"**

- Leading cause of illness / death in tropics
- Over 400 mil infected yearly
- Increasing since 1950's
- Endemic in Puerto Rico, Latin America, Southeast Asia, Pacific Islands
- 2010: reached Florida
- Eradication has failed
- Vaccinations – only hope

#### 94 **DENGUE SYMPTOMS**

- Headache, eye pain
- Muscle, joint or bone pain
- Rash, nausea / vomiting
- Unusual bleeding, bruising (nose, gingiva, skin)
- Severe cases: 24-48 hrs. after fever ends, shock, internal bleeding, death
- Preventable but not curable. Avoid aspirin & ibuprofen

#### 95 **DENGUE DANGERS**

- 4 viral types
- Infection with one type confers permanent immunity
- Infection with another type may activate immune system, but enhance viral growth
- 95% of severe cases are repeated infections with different types

- Need vaccine for all 4 types, or may cause severe hemorrhagic disease

96  **CHIKUNGUNYA**

- Worldwide dissemination of *Aedes* mosquitos
- Arbovirus first isolated – 1950s in Tanzania & Mozambique
- Resembles dengue fever – more arthralgia
- Confined to sub-Saharan Africa, SE Asia for 50 yrs
- 

97  **CHIKUNGUNYA**

- “Emerging” in 1992
- Mutated, abruptly exploded - 2005-2006
- 2014, Caribbean: 35K cases, 6 fatalities
- Since 2013 - 1.7 mil. cases in Americas
- Worldwide spread = much greater risk than Ebola or MERS-CoV
- ~700 U.S. Cases in 2015, 175 in 2016

- Charrel RN, et.al. Chikungunya outbreaks – the globalization of vectorborne diseases. N Engl J Med 2007; 356: 769=771.

- [www.CDC.gov](http://www.CDC.gov)

- 
- 

98  **ZIKA VIRUS**

- Spread by *Aedes* mosquitos (also spread dengue, yellow fever, malaria)
  - Aggressive daytime biters (also night)
- Sexual transmission
- Symptoms:
  - fever, rash, headache, Myalgia, conjunctivitis (or asymptomatic), Guillain-Barré syndrome: immune cells attack nerves

- In dentistry - Standard Precautions!

99  **ZIKA VIRUS**

- Zika kills brain cells
- Microcephaly
- Long term neurological problems = unknown
  - Science News, Jan. 21, 2017

- 

100  **CONTROL EFFORTS**

- Spray malathion (concern)
- Reduce mosquito breeding areas
- Chemically treated mosquito netting (night) & clothing (day)
- Education
- Genetically engineered male mosquitos

- 101  **LARVA OF Aedes Aegypti MOSQUITOS GENETICALLY MODIFIED TO DIE (OXITEC, BRITISH CO.)**
- Tests show release of GMO mosquitos reduces wild Aedes mosquitos 85-90%
- 102  **LYME DISEASE**
- Ticks carry *Borrelia burgdorferi*
  - Headaches
  - Fever
  - Fatigue
  - Rash
  - Chronic biofilm disease
- 103  **LYME DISEASE**
- *Borrelia* forms:
  - Cystic form
  - Pleomorphic
  - Granules
  - Spirochetes
  - Found in biofilms in joints, brain,
  - Dementia, mental illness
- 104  **EBOLA VIRUS**  
**5 ENVELOPED VIRUSES**  
**4 INFECT HUMANS**
- 105  **EBOLA VIRUS TRANSMISSION**
- Direct contact with all body fluids / substances of a symptomatic person or animal (bats, bush meat)
    - Blood, urine, feces, vomit, sweat (CDC)
- 106  **EBOLA TRANSMISSION**
- Exposure to contaminated objects (sharps: needles = highest risk...)
  - Sexually transmitted, > 1 year after male recovers
- 107  **UPDATED PPE TO TREAT SUSPECTED / KNOWN EBOLA PATIENTS**
- Full body suit, no skin exposed
  - Double gloves
  - Fit-tested respirator
  - Training to safely don, remove, use PPE
  - Trained helper to don & remove PPE
  -
- 108  **EBOLA SURVIVORS' AILMENTS**
- Neurological symptoms (~75% of pts.)
    - Memory loss, cognitive disorders

- Headaches, Parkinson's-like symptoms
- Extreme fatigue, anxiety, depression, sleep disorders
- Eyes (~60% of pts):
  - Cataracts, blurred vision, redness, pain, light sensitivity, detached retina, blindness, light flashes
- Muscles: pain, weakness
- Joints & cartilage: pain
- Ears: ringing (tinnitus), deafness / hearing loss

#### 109 **EBOLA (LIKE HIV) HIDES IN RESERVOIRS & RECURS IN EPISODES**

- Virus hides in reservoirs with "immune privilege"
  - Eyes
  - Testes (> 1 year after recovery, even with (-) blood test)
  - Joints, joint cartilage
  - Brain
  - Uterus?
- Immune (macrophage) response to Ebola virus may set off cytokine storm in brain, joints (like HIV) fatigue, pain.
- 
- 
- 

#### 110 **EBOLA VACCINE TRIALS**

- STRIVE = rVSV-ZEBOV (recombinant Vesicular Stomatitis Virus *Zaire ebolavirus* vaccine.
- Protects against *Zaire ebolavirus*
- Vaccine cannot cause Ebola because it does not contain the whole Ebola virus
- "As of April 28, 2016, no Ebola cases and no vaccine-related serious adverse events.." But limited study due to control of epidemic (CDC)

#### 111 **EDUCATION NEEDED**

- > ½ of polled Africans have mis-conceptions:
  - "mosquitos or ambient air spread ebola"
- Majority improved handwashing & touching suspected ebola victims
- 

#### 112 **ENVIRONMENTAL PRECAUTIONS** **EBOLA = CATEGORY A INFECTIOUS SUBSTANCE**

- No products specifically list Ebola
- Use high potency EPA-registered disinfectant with label claim vs. Non-enveloped virus (norovirus, toravirus, adenovirus, poliovirus)
  - Ebola = enveloped virus
  - Margin of safety: will inactivate both classes of viruses (U.S. DOT Haz. Mat. Reg 49 D.F.R, Parts 171-180)

#### 113 **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)

114  **ARE YOU CLEANING BEFORE DISINFECTING???**

It depends on technique  
And product selection

115  **WHICH PRODUCTS CLEAN?**

116  **EFFECTS OF ALCOHOL CONCENTRATION**

117  **WHAT IS THE ACTIVE INGREDIENT?  
WHICH PRODUCTS CLEAN?**

118  **LEAVE FOR STATED TIME**

- Factors:
  - Wipe material
  - Wipe saturation
  - Alcohol content

119  **SIMPLIFY SURFACES**

Environmental disinfection = cardinal feature in dentistry

120  **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)

121  **1 MINUTE  
FIRST WASH OF THE DAY**

- Start with clean hands
- Subsequent hand hygiene will be more effective

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

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

123  **MOST RECOMMENDED:  
COMBINED PROTOCOL**

- 1 Plain soap – routine handwashing

- 2 Antimicrobial / alcohol hand rub on unsoiled hands

124  **IS WATERLESS HAND-RUB EFFECTIVE?**

- 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"
- Contact time: 15 sec.

125  **IF YOU DON'T USE ALCOHOL SANITIZER**

- 1 Plain soap – routine handwashing  
2 Antimicrobial soap periodically

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

- False nails, Nail polish & applications
- Un-manicured nails
- Jewelry
- Petroleum-based products
- Have written policy

127

Broken skin management:

- Protect skin openings
- Finger cots, double glove
- Change dressings often.
- Illegal to treat patients with infection or weeping dermatitis

128  **WHAT'S YOUR WEAKEST LINK?**

129  **SHE RUBBED HER EYE**

- Ocular herpes is usually unilateral
- May migrate up nerve from oral infection.
- Recurs, leading to blindness
- 90% of U.S. adults carry herpes
- Neonates contract type 2 at birth

130  **GLOVES**

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

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

131  **HOW LONG DO GLOVES LAST?**

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

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

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

CDC MMWR 2003

133  **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

134  **DONNING & REMOVAL  
TECHNIQUE & SEQUENCE  
DON IMMEDIATELY B4 USE  
REMOVE IMMEDIATELY AFTER**

135  **WHAT'S YOUR WEAKEST LINK?**

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

- 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



137  **AIRBORNE DISEASES**

- Measles, mumps
- Varicella (including disseminated zoster) Tuberculosis , Flu, SARS, Pertussis
- 

138  **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
  - 
  - Cal OSHA Title 8, Ch 4
  - Section 5199 Aerosol Transmissible Diseases.
  - California-only regulation.

139  **INFLUENZA SIGNS & SYMPTOMS**

- Fever & chills – sudden onset (102 – 106 degrees)
- Cough (loose, then dry)
- Breathing difficulty
- Sore throat
- Intense body aches, skin sensitivity
- Headache, sinus / nasal pain
- Diarrhea, vomiting

140 141  **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

142  **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

143  **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

144  **SCARLET FEVER**

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

145  **SCARLET FEVER**

- Red lines at skin folds
- 

146  **SCARLET FEVER**

- Flushed face, pale ring around mouth

147  **SCARLET FEVER**

Strawberry tongue or coated

148  **SCARLET FEVER**

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

149  **MAKE SURE YOU ARE PROTECTED!**

- 1 • HBV
  - Influenza
  - Measles
  - Mumps
  - Rubella
  - Varicella-Zoster
  - Pertussis
  - 
  - [www.CDC.gov](http://www.CDC.gov): new adult vaccine recs
  - OSHA policies:
    - New hires & employees
  -

- 2 • Tetanus
- Polio
- Pneumonia
- Meningitis
- HPV

150  **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?

151  **SCREEN FOR ACTIVE TB:**

- Productive cough (> 3 weeks)
  - Bloody sputum
- Night sweats
- Fatigue
- Malaise
- Fever
- Unexplained weight loss
- If yes: medical referral, (reportable)

152  **MYCOBACTERIUM TUBERCULOSIS**

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

153  **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?

154  **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

#### 155 **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

#### 156 **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>

#### 157 **DENTAL WORKER HEALTH**

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

#### 158 **WHAT'S YOUR WEAKEST LINK?**

#### 159 **PPE: SURGICAL MASKS**

- Masks are bi-directional barriers
- You & patients depend on them for:
  - Coverage (mouth & nose)
  - Filtration (particles, germs)
  - Fluid protection
- 
- 

#### 160 **ASTM LEVELS**

161  **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!
- 

162  **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

163  **WHAT’S YOUR WEAKEST LINK?**164  **IF YOU DON’T CLEAN IT**

- You can’t disinfect it
- You can’t sterilize it

165  **INSTRUMENT PROCESSING:  
HIGHEST LEVEL OF ASEPSIS**166  **INSTRUMENT PROCESSING  
“TRAFFIC FLOW”**167  **CASSETTES, TUBS, TRAYS WITH LIDS**168  **PRE-CLEANING / HOLDING**169  **ENZYME PREVENTS DEBRIS ADHERENCE – AVOID SCRUBBING**170  **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

171  **ONLY SCRUB IF DEBRIS REMAINS AFTER CLEANING....**

172  **MONITORS HELP VISUALIZE SOIL REMOVAL**

### **NON-TOXIC SYNTHETIC BLOOD/DEBRIS**

**HOLDER ↓**

173  **CDC, ADA, OSAP REC:**

Must heat sterilize ALL removable handpieces, even slow speeds

174  **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

175  **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

176  **WHY LABEL PACKAGES?**

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

177  **TRANSMISSION-BASED PRECAUTIONS  
CONTACT, DROPLET, AIRBORNE**

- Additional to Standard precautions
- Based on -
  - Disease Infectivity
  - How transmitted
- Used in controlled settings when –
  - Infective patients must be treated
  - In hospital, institutional settings
  - HCW becomes infected

- Exceptional

178  **PATHOGENS DISTINGUISHED BY:**

- Infectivity
- Reservoir
- How transmitted
- Route of entry
- Strategies to kill / neutralize

179  **CONTACT DISEASE TRANSMISSION**

- 1 Direct
- 2 • Touching the source
- 3 Indirect
- 4 • Touching and transferring pathogens from surfaces

180  **CONTACT DISEASES**

- GI, respiratory, skin, wound: infections or colonization with resistant pathogens
- Enteric infections
  - Clostridium difficile
  - E coli 0157:H7, Shigella, HAV, rotavirus (diapered pts.)
- Influenza
- Conjunctivitis

181  **CONTACT DISEASES**

- Highly contagious skin inf. on dry or wet skin
    - Herpes simplex virus (neonatal, mucocutaneous)
    - Impetigo
    - Major abscesses, cellulitis
    - Lice
    - Scabies
    - Staph., MRSA
    - Zoster\* (disseminated or in immunocompromised)
- May require >1 precaution

182  **HEPATITIS A & E**

- Fecal – oral transmission
- Poor hand hygiene
- Caring for children & diapered people
- Survives outside body for months

183  **CONTACT PRECAUTIONS**

- Private room
- Glove when entering room
- Remove gloves before leaving room
- Immediate hand hyg.
  - Antimicrobial or alcohol agent
- No bare handed contact w/ pt., items

184  **CONTACT PRECAUTIONS**

- Gown when entering room, remove before leaving room
- Isolate used gown
- Limit pt. Transport
- Maintain precautions if pt. = moved, transported
- Dedicate non-critical equip. to pt., disinfect & barrier if re-used

185  **DROPLET TRANSMISSION**

- 3 • Spray, spatter, coughs, sneezes propel droplets
- Droplets absorbed by mucosa in nose, mouth & ocular tissue
- Most risk = within 3 feet

186  **DROPLET DISEASES**

- Meningitis, pneumonia, sepsis from:
  - Invasive Haemophilus influenzae b
  - Neisseria meningitidis
- Serious bacterial respiratory inf.'s:
  - Diphtheria (pharyngeal)
  - Mycoplasma pneumonia
  - Pertussis
  - Strept. Gp A pharyngitis, pneumonia or scarlet fever in children
  - 
  -

187  **DROPLET DISEASES**

- Serious viral inf.
  - Adenovirus<sup>‡</sup>
  - Influenza
  - Mumps
  - Parvovirus B19
  - Rubella

<sup>‡</sup> requires >1 precaution

188  **DROPLET PRECAUTIONS**

- Private room / cohort, open door =OK
- Maintain  $\geq$  3 ft. Between pts.
- No special air handling
- Mask to enter room, &  $\leq$  3 ft. of pt.
- Move pt out of room only if essential, mask on pt.

189  **TOP (GENERAL) SAFETY GOALS**

- Written Safety Program
- Safety Manager



- Recognize & Understand Risks
- Implement Standard Precautions
- Plan for exceptions and accidents
- 

190  **TOP 3 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

191  **TOP SAFETY GOALS**

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

•

192  **TOP 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.

•

•

193  **TOP 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
  - 
  -

194  **TOP SAFETY GOALS**

- 10. Dental waterline management
  - Insure sterile water for surgeries
  - Insure potable standard for non-surgeries
  - Control waterline contamination
  - Monitor waterline safety
  -

195  **TOP 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
- 

196  **TOP SAFETY GOALS**

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

197  **WHAT YOU DO OVER & OVER**