Rationale for Dental Infection Control
Dr. Raghunath Puttaiah, Texas A&M University
A Webber Training Teleclass

Objectives
- Provide a rationale for the practice of dental infection control.
- Address past & recent history of infection control, routes of disease transmission, rational application of universal/standard/additional precautions, biases towards care of infectious patients, common levels of decontamination and finally practical application of Spaulding's Classification.

Components of Dental Safety

Historical Impact of Infectious Diseases

Why are we doing all this?

Control of Bloodborne pathogens & Other Hazards—
• Dentistry is profoundly a surgical field.
• There is a constant risk of exposure to bloodborne pathogens.
• There is a risk of exposure to saliva and blood during patient care.
• There is a risk of cross contamination between patients.
• Employees may be exposed to sharps, chemicals, dust and aerosols.

Pioneers in Infection Control

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History of Dental Infection Control

- Developed during the 1960s due to Hepatitis B infections
- Only developed momentum after the HIV Pandemic in the mid-1980s
  - after 6 patients infected with HIV by Florida Dentist
  - Recommendations, regulations on standards of care & safety in the US and Europe by Federal Regulatory Agencies

Definition & Rationale

Definition:
- Control of iatrogenic, nosocomial and cross-infection in a dental office including control of occupational exposures to diseases during dental patient care
Control vs. Prevention:
- Control does not mean prevention, it is reduction in the risk of infection
  
We cannot prevent all diseases but can control them

Basic Concepts in Infection Control

Possible spread of a disease cluster

Possible areas of control to reduce risk of disease

Routes of Transmission

1. Percutaneous High
   - Microlites in Blood/Saliva
   - needle, sharp instruments
2. Contact High
   - Microlites in Blood/Saliva
   - splash/sputter of blood & body fluids
3. Inhalation Moderate
   - Suspended Microlites
   - droplet nuclei and aerosols
4. Indirect contact Low
   - Microlites on surfaces
   - Families/contaminated surfaces

Infectious Conditions among unprotected and non-immunized DHCWs, & Restriction of Clinical Duties

<table>
<thead>
<tr>
<th>Condition</th>
<th>Restr.</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conjunctivitis</td>
<td>Yes</td>
<td>Until discharge ceases</td>
</tr>
<tr>
<td>Staph. Active</td>
<td>Yes</td>
<td>Until lesions have healed</td>
</tr>
<tr>
<td>Strep. A</td>
<td>Yes</td>
<td>Until 24 hours after starting Tx</td>
</tr>
<tr>
<td>Viral respiratory</td>
<td>Yes</td>
<td>Until acute symptoms resolve</td>
</tr>
<tr>
<td>TB (active)</td>
<td>Yes</td>
<td>Until treated non-infectious</td>
</tr>
<tr>
<td>TB (+ve PPD)</td>
<td>No</td>
<td>Evaluate for infectious status (and care as needed)</td>
</tr>
<tr>
<td>Influenza</td>
<td>Yes</td>
<td>Until DHCW is asymptomatic</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Condition</th>
<th>Restr.</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediculosis (Lice)</td>
<td>Yes</td>
<td>Until treated and is with no lice</td>
</tr>
<tr>
<td>Herpetic whitlow</td>
<td>Yes</td>
<td>Until lesions heal</td>
</tr>
<tr>
<td>Herpes - Orofacial</td>
<td>Yes</td>
<td>Until clinical lesions are healed (need to be on regular anti-viral meds)</td>
</tr>
<tr>
<td>Varicella (Ch. Pox)</td>
<td>Yes</td>
<td>Until lesions dry and crust</td>
</tr>
<tr>
<td>Shingles (Zoster)</td>
<td>Yes</td>
<td>Until lesions dry and crust</td>
</tr>
<tr>
<td>Hep-B (HBe antigen)</td>
<td>Yes</td>
<td>Until Hepatitis-B e antigen is negative (UP, expert panel and care)</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>No</td>
<td>UP/SP, Aseptic techniques and care to reduce viral load</td>
</tr>
<tr>
<td>HIV</td>
<td>Yes</td>
<td>Expert panel, UP/SP, antiviral meds</td>
</tr>
</tbody>
</table>

Infectious Conditions among unprotected and non-immunized DHKWs, & Restriction of Clinical Duties

<table>
<thead>
<tr>
<th>Condition</th>
<th>Restr.</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>Yes</td>
<td>Until 7 days after rash appears</td>
</tr>
<tr>
<td>Mumps</td>
<td>Yes</td>
<td>Until 9 days after start of parotitis</td>
</tr>
<tr>
<td>Rubella</td>
<td>Yes</td>
<td>Until 5 days after rash appears</td>
</tr>
<tr>
<td>Pertussis</td>
<td>Yes</td>
<td>Until 5 days after start of effective antibiotic therapy</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>Yes</td>
<td>Until symptoms resolve</td>
</tr>
<tr>
<td>Enteroviral</td>
<td>Yes</td>
<td>Until symptoms resolve</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>Yes</td>
<td>Until 7 days from onset of Jaundice</td>
</tr>
</tbody>
</table>

Standard Precautions/Universal Precautions/ Routine Practices

Definition:
- To treat all patients as potentially infectious and not to base the level of infection control on the appearance or disease status of patient
- Level of control to be based on type of procedure and reasonably anticipated type of exposure

Biases towards Care of Infectious Patients

- Skewed approach towards analysis
- Systematic error
- Error in judgment
- Not understanding the true picture
- Precedes the act of discrimination
- Inequality
- Commonly seen biases in life
- Need to take a more scientific approach
- Action = Avoid Discrimination

Not scientific, could be hurtful and simply wrong

Bias

Mother & Child

Judgmental Approach

Foreword

-Dental Infection Control & Safety has been in the forefront of efforts all over the world
-Both practicing dentists and dental faculty have shown varying degrees of biases towards Infectious Disease Patients
-Evidence from recent and past studies has shown— “in spite of regulations and education, there exists a gap in understanding Standard Precautions”
-Many may be influenced by stigma towards ID patients
-Efforts in education on stigma, ethical issues and finally laws regulating equality need to be the mainstay

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Evidence – UP & SP 1998-2004

<table>
<thead>
<tr>
<th>HBV &amp; HIV status of patients is always known (NO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind</td>
</tr>
<tr>
<td>% 15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>All Patients to be treated alike irrespective of ID (YES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind</td>
</tr>
<tr>
<td>% 67</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medical History/appearance dictates level of IC (NO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ind</td>
</tr>
<tr>
<td>% 51</td>
</tr>
</tbody>
</table>

Evidence – “2010-India”

<table>
<thead>
<tr>
<th>Respondent—</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Comfortable treating patients with ID</td>
</tr>
<tr>
<td>- Use Additional Precautions for (ID) patients</td>
</tr>
<tr>
<td>- Double-glove for patient with Bloodborne Disease/STD</td>
</tr>
<tr>
<td>- Use Full PPE for ID patient irrespective of Procedure</td>
</tr>
<tr>
<td>- Schedule ID patients at a “separate time or day”</td>
</tr>
<tr>
<td>- Refused care for patients with Bloodborne Diseases/STDs</td>
</tr>
<tr>
<td>- Have the right to refuse care for patients with IDs</td>
</tr>
<tr>
<td>- Refused care for ID patients—others feel uncomfortable</td>
</tr>
<tr>
<td>- Others will not come if ID patients treated in clinic</td>
</tr>
<tr>
<td>- Infectious disease status is always known</td>
</tr>
<tr>
<td>- Treat patient from abroad at my clinic</td>
</tr>
<tr>
<td>- Patients from abroad more demanding of Dental Safety</td>
</tr>
</tbody>
</table>

Conclusions and Actions

- Bias exists
- More knowledge of IC should reduce Bias
- Spread the word .... Educate
- Standardized Curriculum for all Dental Schools
- Bring in a little Infection Control while teaching other subjects
- Speak to students, faculty and practitioners on UP/SP in relation to “Biases towards ID Patients”

Basic Measures of Control

- There are three basic measures of control in Dental Infection Control—
  - Sanitization
  - Disinfection
  - Sterilization
- What is decontamination?
  - “Public health Use of physical or chemical means to remove, inactivate, or destroy bloodborne or other pathogens on a surface or item, to the point where they are no longer capable of transmitting infectious particles, and the surface or item is rendered safe for handling, use, or disposal” (McGraw Hill Concise Dictionary of Modern Medicine).

Sanitize

“A process of physical cleaning to reduce the quantity of microbes and bioburden”
- Use of disinfectant/cleaning solution and paper towels (surfaces)
- Use of soap and brush (instruments)
- Use of ultrasonic methods (dito)
To be done before disinfection & sterilization
- Critical, semi-critical, non-critical items & environmental surfaces

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Disinfection
“A process to kill all vegetative organisms but not necessarily spores”
• Use of a germicide or disinfectant
• Use of X-rays
• Use of Ultraviolet rays
To disinfect impressions, counter-surfaces, equipment between patient use, we do not disinfect instrument used intra-ally
- Non-critical items & environmental surfaces

Sterilization
“A process to kill all bacterial and viral contaminants including bacterial endospores”
• Chemical sterilants
  – Chemi-ettes, ETO, Gas Plasma, Liquid Sterilants
• Physical methods
  – Autoclaves, Dry Heat, Rapid-Heat-transfer, Radiation
- All critical and semi-critical items

Spaulding’s Classification of Surfaces
1. Critical:
   • Items that pierce skin or mucosa
     – Explorers, scalpels, scalers, burs & other sharps
2. Semi-Critical:
   • Non-sharp items that enter the oral cavity
     – Amalgam condensers, mirrors, handpiece
3. Non-Critical:
   • Items not entering the oral cavity
     – Bracket table, face-bow, chair controls
4. Environmental:
   • Walls, floors and environmental surfaces

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Spaulding’s Classification of Surfaces

1. Critical: STERILIZATION
   - Items that pierce skin or mucosa
     - Explorers, scalpels, scalers, burs & other sharps

2. Semi-Critical: STERILIZATION
   - Non-sharp items that enter the oral cavity
     - Amalgam condensers, mirrors, handpiece

3. Non-Critical: DISINFECTION
   - Items not entering the oral cavity
     - Bracket table, face-bow, chair controls

4. Environmental: HOUSEKEEPING
   - Walls, floors and environmental surfaces

Environmental Surfaces

Do’s and Don'ts

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Do's and Don'ts

Dress Code and Appearance

Length of Nails
Acceptable
Length of nails (dorsal)

Cannot see the nails (palmar)

Acceptable

Questionable
May cause damage to gloves

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Questions?

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