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

Rationale for dental infection control

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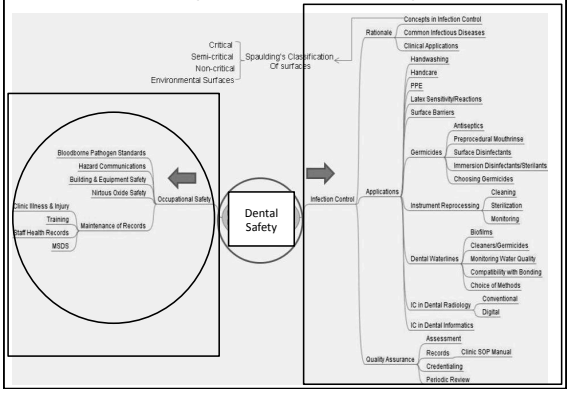
Hosted by Jim Gauthier
Providence Care
Kingston, Ontario

Objectives

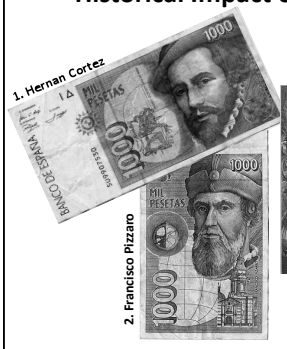
- Provide a rationale for the practice of dental infection control.

- 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



3. Cortez and Montezuma in Tenochtitlan

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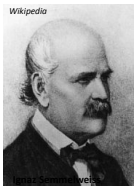
Why are we doing all this?

Control of Bloodborne pathogens & Other Hazards—

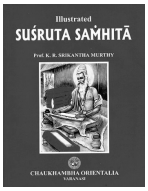
- Dentistry is predominantly a surgical field
- There is a constant risk of exposure to bloodborne pathogens
- There is a risk of exposure to saliva and blood during patient care
- There is a risk of cross contamination (between patients)
- Employees may be exposed to sharps, chemicals, dust and aerosols

Pioneers in Infection Control



•Childbed fever caused by physicians & medical students
•Washing hands reduced rates from 18% to <2%
•Findings not accepted by peers

•Using carbolic acid reduced nosocomial infections in the Glasgow General Hospital
•Findings well accepted



Sushrutha
•Considered the father of surgery
•400-800BC
•Wrote a treatise on surgery
•Used fumigation techniques
•Clip nails and hair, clean and flame surgical instruments

1. Benedek, István (1983) *Ignaz Phillip Semmelweis 1818-1865*, Gyomaendrőd, Hungary: Corvina Kiadó ISBN: 9631314596. plate 15
2. Joseph Lister source: http://history.amedd.army.mil/booksdocs/misc/evprev/flg23.jpg

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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

-Dentistry is predominantly a surgical field
-Great potential for disease transmission

Definition & Rationale

Definition:

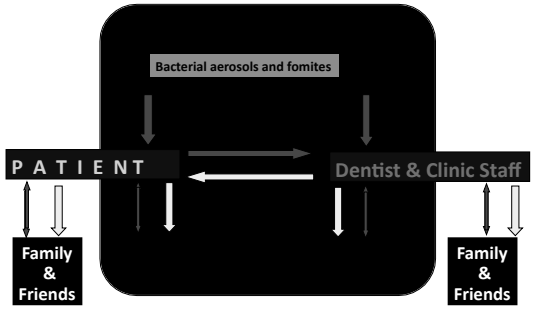
–Control of iatrogenic, nosocomial and cross-infection in a dental office including control of occupational exposures to diseases during dental patient care

Control *vs.* Prevention:

–Control does not mean prevention, it is reduction in the risk of infection

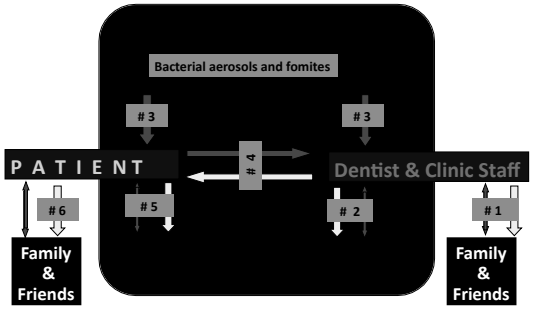
We cannot prevent all diseases but can control them

Basic Concepts in Infection Control



Possible spread of a disease cluster

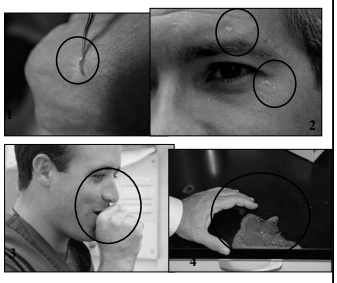
Basic Concepts in Infection Control



Possible areas of control to reduce risk of disease

Routes of Transmission

1. **Percutaneous** ***high***
   Microbes in Blood/Saliva
   – **needle, sharp instruments**
2. **Contact** ***high***
   Microbes in Blood/Saliva
   – **splash/spatter of blood & body fluids**
3. **Inhalation** ***moderate***
   Suspended Microbes
   – **droplet nuclei and aerosols**
4. **Indirect contact** ***low***
   Microbes on Surfaces
   – **Fomites/contaminated surfaces**



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

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

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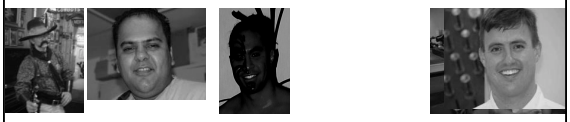
Infectious Conditions among unprotected and non-immunized DHCWs, & Restriction of Clinical Duties

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

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

Condition	Restr.	Duration
Measles	Yes	Until 7 days after rash appears
Mumps	Yes	Until 9 days after start of parotitis
Rubella	Yes	Until 5 days after rash appears
Pertussis	Yes	Until 5 days after start of effective antibiotic therapy
Diarrhea	Yes	Until symptoms resolve
Enteroviral	Yes	Until symptoms resolve
Hepatitis A	Yes	Until 7 days from onset of Jaundice

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**

What defines the level of control?
- **Level of control to be based on type of procedure and reasonably anticipated type of exposure**

Biases towards Care of Infectious Patients

Bias

- **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**

Mother & Child

Judgmental Approach

Not scientific, could be hurtful and simply wrong

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

HBV &HIV status of patients is always known (NO)

	Ind	Pak	Tha	Phi	Tai	Chi	S. K.	USA
%	15	12	35	20	33	13	62	64

All Patients to be treated alike irrespective of ID (YES)

	Ind	Pak	Tha	Phi	Tai	Chi	S. K.	USA
%	67	65	83	66	79	78	36	79

Medical History/appearance dictates level of IC (NO)

	Ind	Pak	Tha	Phi	Tai	Chi	S. K.	USA
%	51	50	54	61	57	46	86	72

Evidence – UP & SP 1998-2004

Double-gloving more appropriate for tx of ID patients (NO)

	Ind	Pak	Tha	Phi	Tai	Chi	S. K.	USA
%	75	53	68	59	64	54	69	69

Right to refuse care for Infectious Patient (NO)

	Ind	Pak	Tha	Phi	Tai	Chi	S. K.	USA
%	20	18	31	41	30	17	50	67

Need for more training in Infection Control & Safety (Opinion)

	Ind	Pak	Tha	Phi	Tai	Chi	S. K.	USA
%	84	94	73	82	91	94	95	87

Evidence – "2010-India"

Respondent—	
-Comfortable treating patients with ID	75.0%
-Use Additional Precautions for (ID) patients	58.8%
-Double-glove for patient with Bloodborne Disease/STD	83.3%
-Use Full PPE for ID patient irrespective of Procedure	72.9%
-Schedule ID patients at a *"separate time* or *day"*	32.0%
-Refused care for patients with Bloodborne Diseases/STDs	52.6%
-Have the right to refuse care for patients with IDs	16.0%
-Refused care for ID patients--others feel uncomfortable	22.4%
-Others will not come if ID patients treated in clinic	21.0%
-Infectious disease status is always known	27.6%
-Treat patient from abroad at my clinic	30.9%
-Patients from abroad more demanding of Dental Safety	87.5%

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 (*ditto*)**

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-orally

- Non-critical items & environmental surfaces

Sterilization

"A process to kill all bacterial and viral contaminants including bacterial endospores"

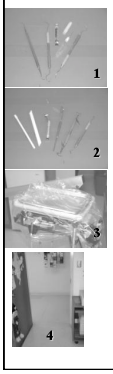
- Chemical sterilants
  - Chemiclaves, ETO, Gas Plasma, Liquid Sterilants
- Physical methods
  - Autoclaves, Dry Heat, Rapid-Heat-transfer, Radiation

- All critical and semi-critical items

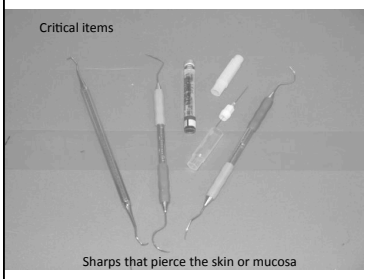
Adaptation of Spaulding's Classification to clinical surfaces

1. Critical Surfaces } Sterilization
2. Semi-critical surfaces
3. Non-critical surfaces } Disinfection
4. Environmental surfaces } Sanitization

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



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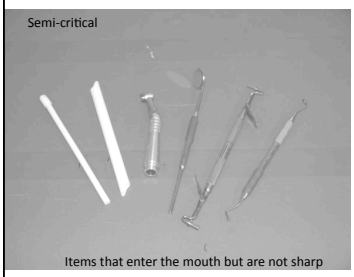
Semi-critical



Items that enter the mouth but are not sharp

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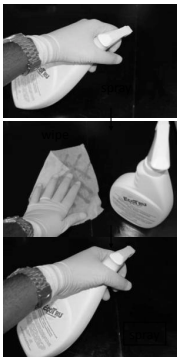
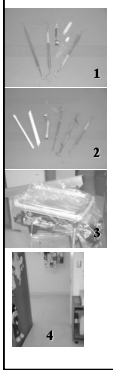
Non-critical



Items that do not enter the mouth but those that are touched often during care

Spaulding's Classification of Surfaces



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Environmental Surfaces

General Housekeeping

Do's and Don'ts

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Do's and Don'ts

Do's and Don'ts

Dress Code and Appearance

Length of Nails

Length of Nails

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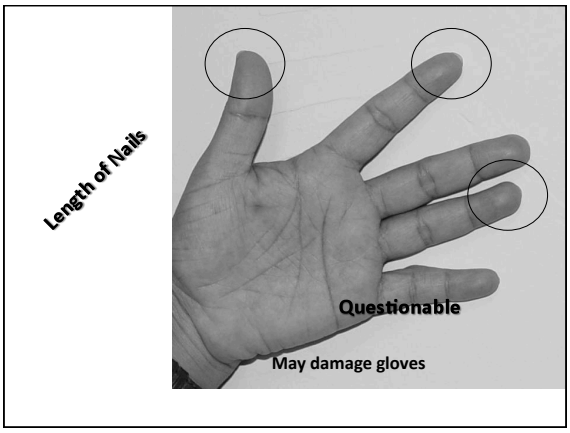

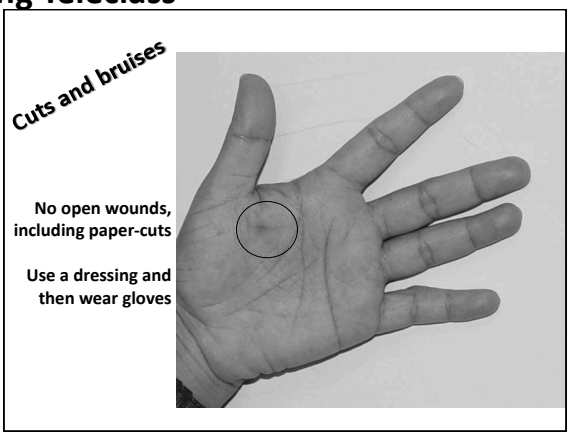

Questions?

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11 March DETECTING *C. DIFFICILE*: IS THERE LIGHT AT THE END OF THE COLON?
Speaker: Dr. Stephen Brecher, PhD, VA Boston Health Care System
Broadcast live from APIC C. difficile conference in Baltimore

12 March PRACTICAL STRATEGIES TO CONTROL THE SPREAD OF *C. DIFFICILE* IN HEALTHCARE
Speaker: Phenelle Segal, RN, CIC, Infection Control Consulting Services
Broadcast live from APIC C. difficile conference in Baltimore

14 March UPDATE ON "NO TOUCH" ROOM DISINFECTION SYSTEMS: UV LIGHTS, HYDROGEN PEROXIDE AND OZONE
Speaker: Dr Dick Zoutman, Queen's University, Kingston

21 March TUBERCULOSIS INFECTION CONTROL IN HIGH HIV BURDENED COUNTRIES
Speaker: Virginia Lipke, CDC, Atlanta

09 April *(WHO Teleclass)* INNOVATION AND NEW INDICATORS IN HAND HYGIENE

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