Infection control in Dentistry

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Cross infection

The passage of infection from one individual to another in a health care environment:

- direct contact with blood or saliva
- indirect contact
  - injection or inoculation via sharp instruments or an open wound
  - on fingers - patient to patient, via intermediate surfaces: clothing, chair controls, records
  - contaminated instruments
  - aerosol, spray, splutter
Severity of infection

- Depends on
  - The aggressiveness
  - The number
  - The multiplication and resistance capacity of the microorganisms
Routes of Transmission

• Direct contact
  – With blood, saliva or any other body fluids

• Indirect contact
  – Injection or inoculation via sharp instruments or contamination of an open wound
  – On fingers or via intermediate surfaces: clothing, chair controls, records
  – Contaminated instruments
  – Aerosol, spray, splatter
Cross infection control

- Infection control procedures ought to prevent cross infection from all types of micro-organisms.
- Implementing safe and realistic infection control procedures requires the full compliance of the dental team.
- Procedures should be regularly monitored during clinical sessions.
Most dangerous microorganisms causing diseases in the health care environment

- Hepatitis B virus
- Hepatitis C virus
- HIV virus
- The way of infection is
  - Injury by a sharp contaminated instrument
  - Contamination via the nose, the eye, or the skin
Hepatitis C

- Transmission is percutaneous via contaminated blood
- About 3.9 million cases in the USA
  - Most of them are asymptomatic men of 45-65 years of age, who were infected via blood derivates before 1987.
- Today
  - 60% of the infected patients are the injection drug users
  - 20% sexually infected
  - 14% unknown origin, but inferior social facilities
  - 10%:
    - 3% tattooing, and bodypiercing persons
    - 0.0001% transfusion
    - 1-2% health care workers
    - Home environment
    - Perinatally contaminated (commonly HIV-positive mother)
- 25% of the alcohol abusers are infected
Figure 1. Reported cases of acute hepatitis C by selected risk factors - United States, 1983-1996
Figure 2. Prevalence of hepatitis C virus (HCV) infection by age and race/ethnicity--United States, 1988-1994

Source: Third National Health and Nutrition Examination Survey, CDC.
In case of exposition the risk for being infected

- Hep B in case of a non vaccinated person:
  - Injured by a sharp instrument: 6-30%
- Hep C:
  - Injured by a sharp instrument: 1.8%
  - Eye, nose, mouth, skin infection is estimated to be low
- HIV:
  - Injured by a sharp instrument: 0.1%
  - Eye, nose, mouth, skin infection: 0-0.1%
Personal protection

- 1. Immunisation
- Hep B
- Hep C?
- HIV?
Personal protection

2. Hand protection:
   - jewellery and watches shouldn’t be worn
   - hand washing should be performed carefully, using a skin disinfectant
   - non-sterile gloves should be worn and changed after every patient

3. Eye protection and face masks
   - protects against foreign bodies, aerosol, splatter

4. Surgery clothing
Schutz- und Berufskleidung...
Verschiedene Schutzbrillen
Patient protection

- Disposable patient’s bib must be worn during routine care
- Protective glasses
Surgery design

- Simple, uncluttered
- Well ventilated
- Floor covering should be impervious, non-slip and seam free
- Junctions of the floor and the wall and of the working surfaces and the wall should be coved to aid cleaning
Three Hygiene Zones

- Treatment zone
- Outer treatment zone
- Remainder of the room

• Contaminated items should not be returned to the clean areas, than on a waste tray or holding solution
Treatment zone

- The highest level of hygiene must be applied
  - where instruments and materials are placed
  - bracket table and mobile cart
  - surrounding worktop
- Unused materials and instruments out of this zone, covered
- Used materials stored here until the patient is dismissed
Einlegen der Instrumente in eine Wanne
Outer treatment zone

• Commonly used items, treated with high level of disinfectant between each patient
  – handpiece housing
  – triple syringe
  – X-ray machine
  – operating light
  – suction hoses
  – spittoon
  – buttons of the chair, taps, sink
  – materials and containers
Remainder of the room

- Non-critical areas of surgery
  - items for individual treatment procedures,
  - instruments and materials should be confined to trays or covered areas
Disinfection of surfaces

- Cleaning with disinfectant and a strong disposable tissue or gauze
- Disinfecting (sprayed surface, and the disinfectant left on the cleaned surface for at least 10 minutes)
Cleaning and sterilization of instruments and equipment

- All instruments contaminated with oral or body fluids are sterilized
  - pre-sterilization cleaning
    - hand cleaning, detergent, brush
    - ultrasonic bath, detergent
    - disinfection, packing
  - sterilization
    - autoclaves
  - Aseptic storage
Kontrolle und Nachreinigung
Nach Ablauf der Desinfektionszeit: Abspülen unter Wasser
Ultraschallbad mit Desinfektionsmittel
Chirurgische Instrumente in Klarsichtsterilisierverpackungen
Heißdampfsterilisator (Autoklav)
Heißluftsterilisator
Metallkassetten ohne Perforation.
Dentalkassette, Deckel und Boden oder Boden perforiert, mit Filterpapier.
Autoklavieren von Normkassetten
Suggested time and temperature sets for autoclaving

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<th>Temperature °C</th>
<th>Minimum impact time (min)</th>
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Einordnen in Bohrerständer
Ultraschall zur Unterstützung der Desinfektion
Endokassette zur übersichtlichen und steril Lagerung
Antiretraction valve
Waste disposal

- Sharp disposables should be placed in a solid sharps container
- Contaminated patient borne waste should be placed in a color coded (yellow) waste bin
- Liquid waste must be poured into a drainer toilet that is directly linked to a sewer sanitary system
- Amalgam scrap must be placed in designated containers
- WASTE MUST NOT BE DROPPED INTO THE COMMUNITY WASTE CONTAINERS IT MUST BE TRANSFERRED BY SPECIALIZED COMPANIES!!!