Infection Control in Dentistry

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Cross Infection

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

Severity of Infection

- Depends on
  - The agressiveness
  - The number
  - The multiplication and resistance capacity

of the microorganisms

Routes of Transmission

- direct contact with blood or saliva
- indirect contact
  - 1.injection or inoculation via sharp instruments or an open wound
  - 2. on fingers - patient to patient , via intermediate surfaces: clothing , chair controls , records
  - 3.contaminated instruments
  - 4. aerosol , spray , splatter

Potentially Pathogens in the Dental Healthcare Environment

VIRUSES

- Cytomegalovirus
- Hepatitis B virus
- Hepatitis C virus
- HIV virus
- Herpes simplex 1 and 2 viruses
- SARS-2-COVID-19 virus

BACTERIA

- Mycobacterium Tuberculosis (TBC)
- Staphylococci
- Streptococci

Micoorganisms that colonize in the oral cavity or in the airways, **blood-borne pathogens** and **air-borne pathogens**

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 complience 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

SARS2-COVID-19

virus

Mycobacterium TBC

The way of infection is

- Via aerosol, spray
- Via dropplets
- Via air

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

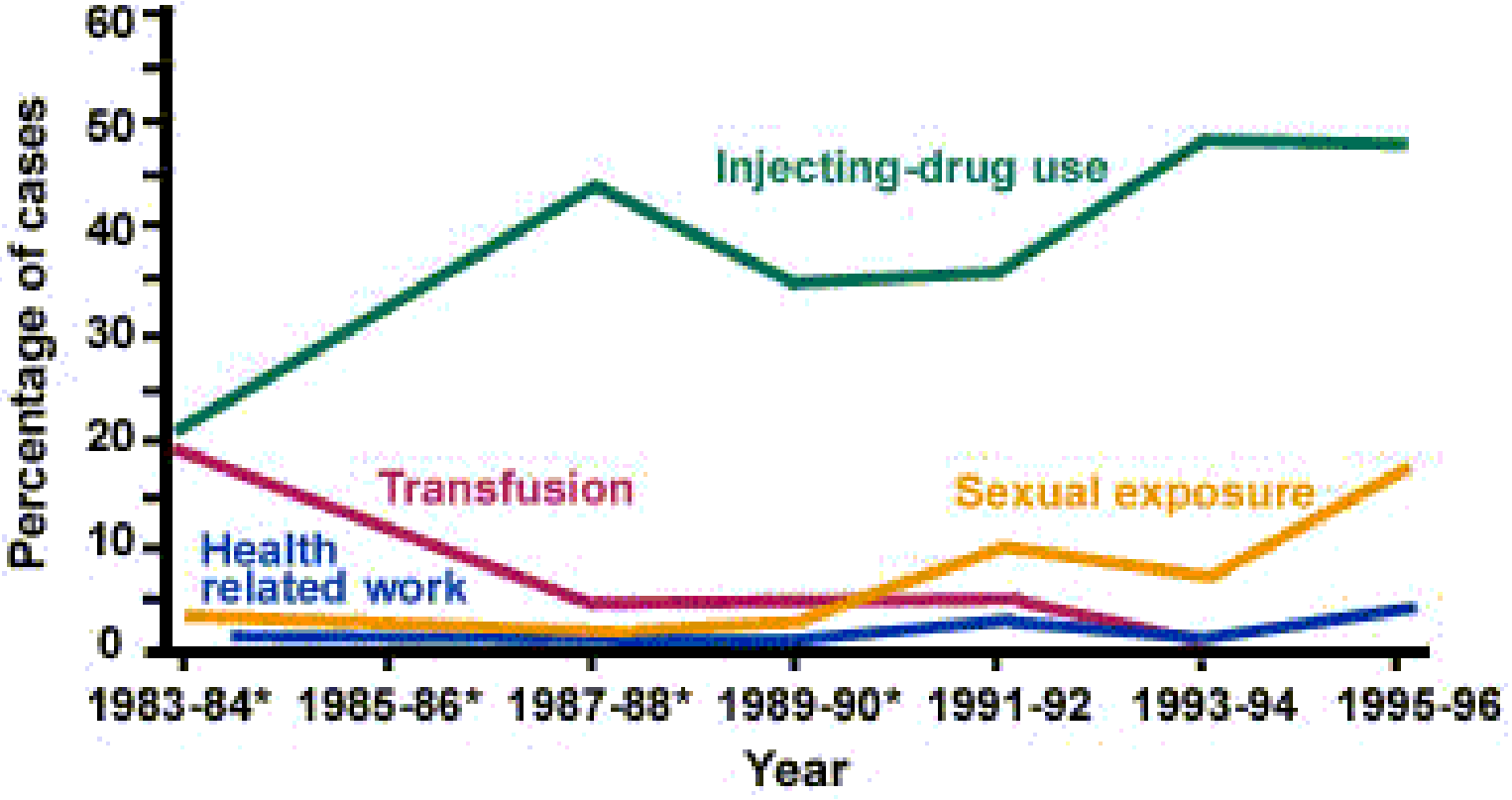
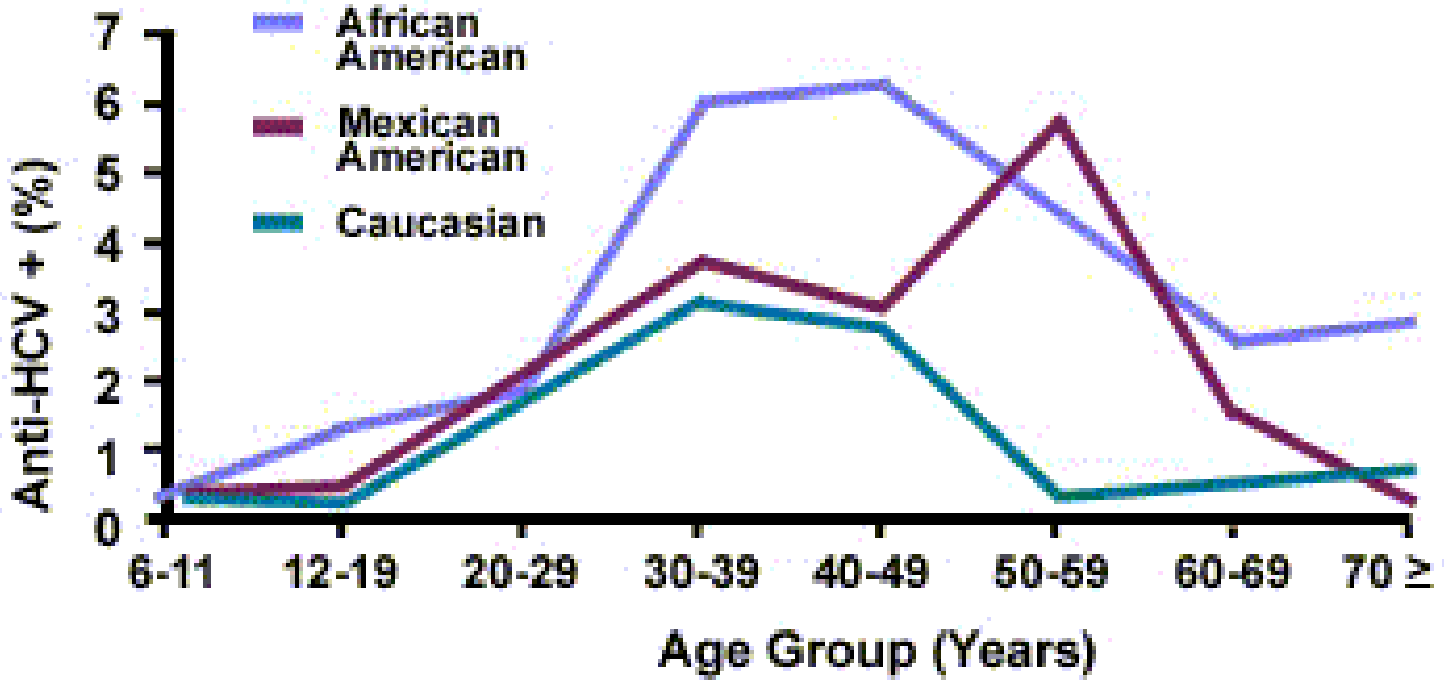


Figure 2. Prevalence of hepatitis C virus (HCV) infection by age and race/ethnicity--United States, 1988-1994



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:
  - Injuried by a sharp instrument: 6-30%
- Hep C:
  - Injuried by a sharp instrument: 1.8 %
  - Eye, nose, mouth, skin infection is estimated to be low
- HIV:
  - Injuried by a sharp instrument: 0.1%
  - Eye, nose, mouth, skin infection: 0-0.1%

Personal protection 1.

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

Personal protection 2 (personal protection equipments - PPE-s)

- 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 (**glasses, shields) and face masks**
  - protect against foreign bodies , aerosol , splatter
- 4.Surgery clothing

Schutz- und Berufskleidung ...

Verschiedene Schutzbrillen

Kopfhaube

Patient protection

- Disposable patient's bib must be worn during rutine care
- Protective glasses
  - Protects the patient's eyes against contamination from the aorsol splatter during tooth-preparations

Surgery design

- Simple, uncluttered
- Well ventillated
- Floor covering should be impervious, non-slip and sleam 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

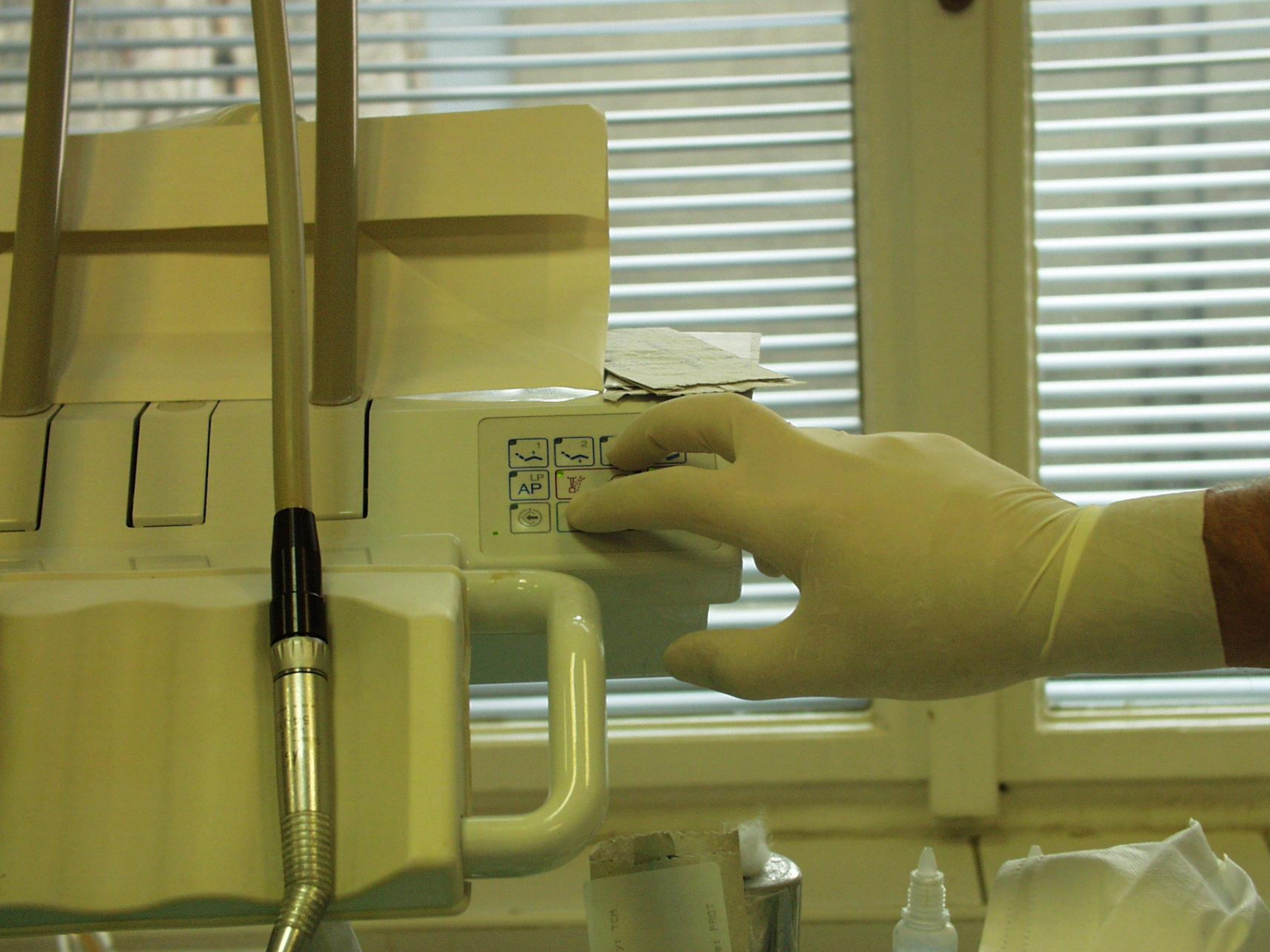
Einlegen der Instrumente in eine Wanne

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


KÉZMOSÓ


AP
ALKOHOL
TODUR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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)


ELVÉGZETT KEZELÉS
Dátum

Munkaidő nyilvántartás fogyatékos személyek részére

Hónap: 2013. május

Dátum	Munkaidő kezdete	Munkaidő vége	Ledolgozott órák száma	Aláírás
2013. 05. 01.	8:00	16:00	8	
2013. 05. 02.	8:00	16:00	8	
2013. 05. 03.	8:00	16:00	8	
2013. 05. 04.	8:00	16:00	8	
2013. 05. 05.	8:00	16:00	8	
2013. 05. 06.	8:00	16:00	8	
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2013. 05. 10.	8:00	16:00	8	
2013. 05. 11.	8:00	16:00	8	
2013. 05. 12.	8:00	16:00	8	
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2013. 05. 29.	8:00	16:00	8	
2013. 05. 30.	8:00	16:00	8	
2013. 05. 31.	8:00	16:00	8	

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

Hand-cleaning with a brush

Washing of the handinstruments after the disinfection time is over

Ultrasonic cleaning in detergent solution

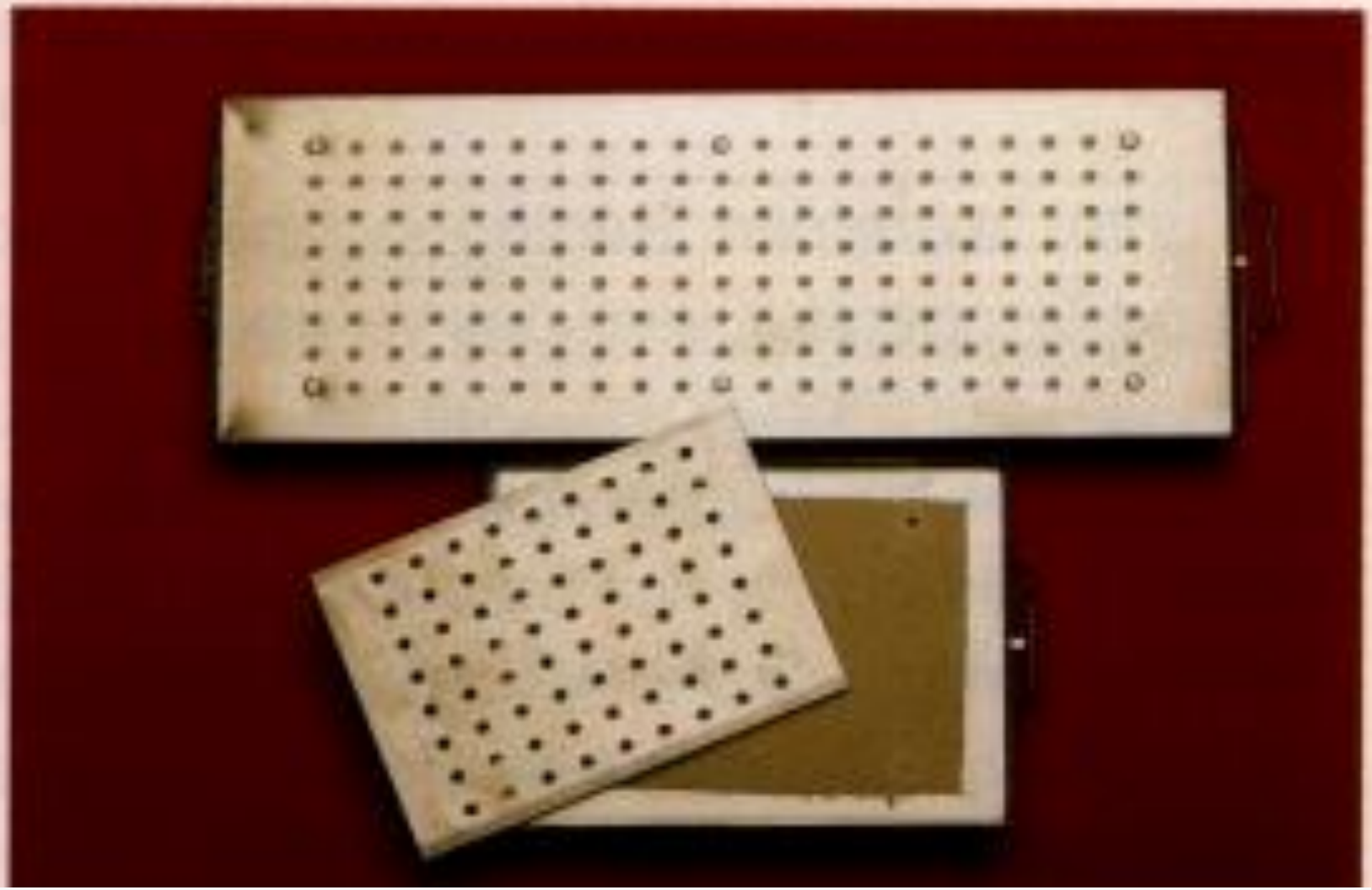
Custom packed instruments for sterilization

Autoclave (stean air sterilizing device)

Air oven sterilizing device


MDT Harvey
MDT Harvey
Chemiclave EC5500

Metal cassettes without perforation



Metal cassettes with perforation

Autoclaving with cassettes

Suggested time and temperature sets for autoclaving

Temprature °C	
134-138	*3*
126-129	10
121-124	15
115-118	30

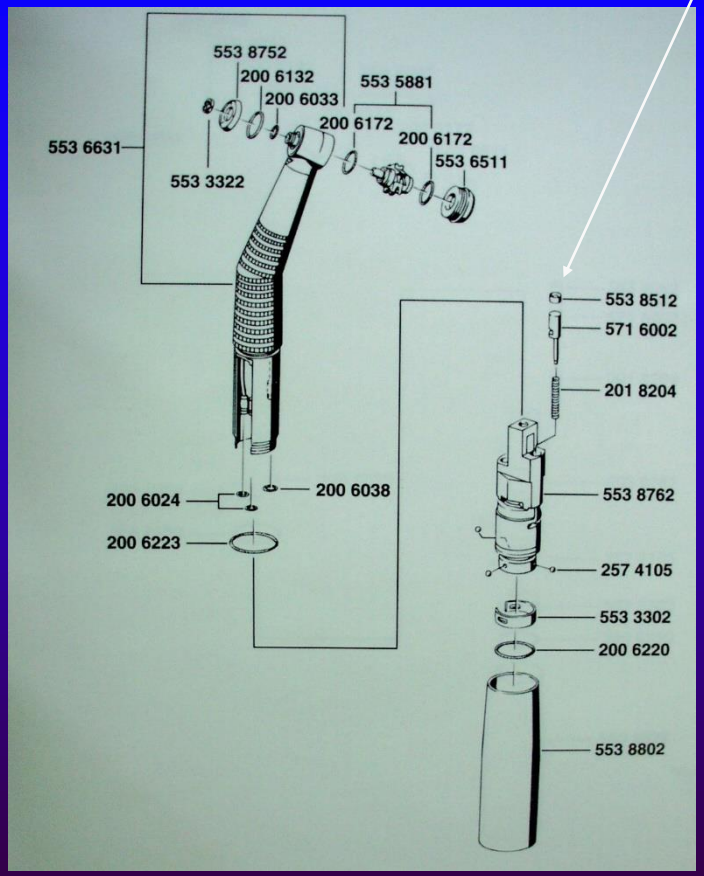
Storing burs

Ultrasonic cleaning of the endodontic insturments

Endocassette for sterilization and storing endodontic instruments


135°C

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!!!

COVID-19

- SARS-CoV-2, the virus that causes COVID-19, is thought to spread primarily between people who are in close contact with one another (within 6 feet) through respiratory droplets produced when an infected person coughs, sneezes, or talks.
- Airborne transmission from person-to-person over long distances is unlikely
- https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html#section-1

Guidance for Dental Settings

Special needs- aerosol and dropplet formation

- **Contact the patient before treatment**
  - **Implement Teledentistry and Triage Protocols**
    - symptoms, onnections, temperature assessment
  - History
- **Implement Universal Source Control Measures**
- Patient encounters -Waiting room

  with moderate to substantial community transmission
  - Patients and visitors should, ideally, wear their own cloth facemask
  - Dental Healthcare Practicioners (DHCP) should wear a face mask or cloth face covering **at all times** .
  - **Physical Distancing**
  - Hand cleaning facility
- Office.

Dental Office

- **Use of rotary dental and surgical instruments, such as handpieces or ultrasonic scalers and air-water syringes**.
  - visible spray that can contain particle droplets of water, saliva, blood, microorganisms, and other debris.
  - Surgical masks protect mucous membranes of the mouth and nose from droplet spatter, but they do not provide complete protection against inhalation of infectious agents.
- **Implement Universal Use of Personal Protective Equipment (PPE)**
  - DHCP should wear a surgical mask,
  - eye protection (goggles or a face shield that covers the front and sides of the face), a gown or protective clothing, and gloves during procedures likely to generate splashing or spattering of blood or other body fluids
  - During aerosol generating procedures DHCP should use an N95 respirator or a respirator that offers an equivalent or higher level of protection
- **Preprocedure rinsing with an antimicrobial product** (chlorhexidine gluconate or cetylpyridinium chloride) may reduce the level of oral microorganisms in aerosols and spatter
- **Aerosol generating procedures -** use four-handed dentistry, high evacuation suction and dental dams to minimize droplet spatter and aerosols

Thank You for Your Attention!!