Infection control in Dentistry 2

Surgery design, Desinfection, Sterilization

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Cleaning and sterilization of instruments and equipment

- All instruments contaminated with oral or body fluids are ought to be sterilized

Sterilization

-Killing or irreversible inactivation of all microorganisms that are able to be multiplicate.
-Its objective is the complete elimination of all forms of vitality inculding DNA-, RNA-viruses, and prions.
-Result is a complete germ-free status

- pre-sterilization cleaning
  - hand cleaning , detergent , brush
  - ultrasonic bath , detergent
  - disinfection , packing
- Sterilization procedure
  - Autoclaves or other equipment
- Aseptic storage of the sterile instruments

Forms of Sterilization

Steam- autoclave

Air-oven

Ethylene-oxyde gas

Formaldehyde gas

Peroxyde plasma

Steam (autoclave)

a machine that uses steam under pressure to kill microorganisms on items that are placed inside a pressure vessel

Sterilization cycles can be divided into three distinct phases: conditioning, exposure and drying.

Conditioning
air is removed from the load and the items in the load are heated to the desired temperature for sterilization. Conditioning is important because if there is any air in the load it may prevent the sterilant from coming into contact with load items, leading to sterilization failure. During exposure, the load is held at a specific temperature for a time known to provide effective sterilization. After exposure, steam is removed from the chamber and the load is dried to prevent recontamination of the instruments through wicking of microorganisms through a wet wrap.

Sterilization Cycles

During **GRAVITY** cycle conditioning, steam displaces the air in the chamber and the force of gravity causes the heavier air to exit the chamber via the sterilizer drain. Gravity cycles typically require more exposure time because the air removal method is more passive in nature.

PREVACUUM cycles condition wrapped loads through a series of pressurizations with steam and evacuations of the chamber using a mechanical vacuum system. The vacuum system facilitates more efficient air removal when compared to the gravity method, especially when processing lumened items. During evacuations of the chamber, the pressure in the chamber drops to below atmospheric. Consequently, if there are any leaks in the piping or sterilizer seal, the potential exists to re-introduce air into the chamber.

The Bowie-Dick test is conducted daily to ensure that the vacuum system is adequately removing air from the chamber and should be used in conjunction with a weekly leak test to determine if there are leaks in the sterilizer plumbing or seal.

Hand-cleaning with a brush

Washing of the handinstruments after the disinfection time is over

Ultrasonic cleaning in detergent solution

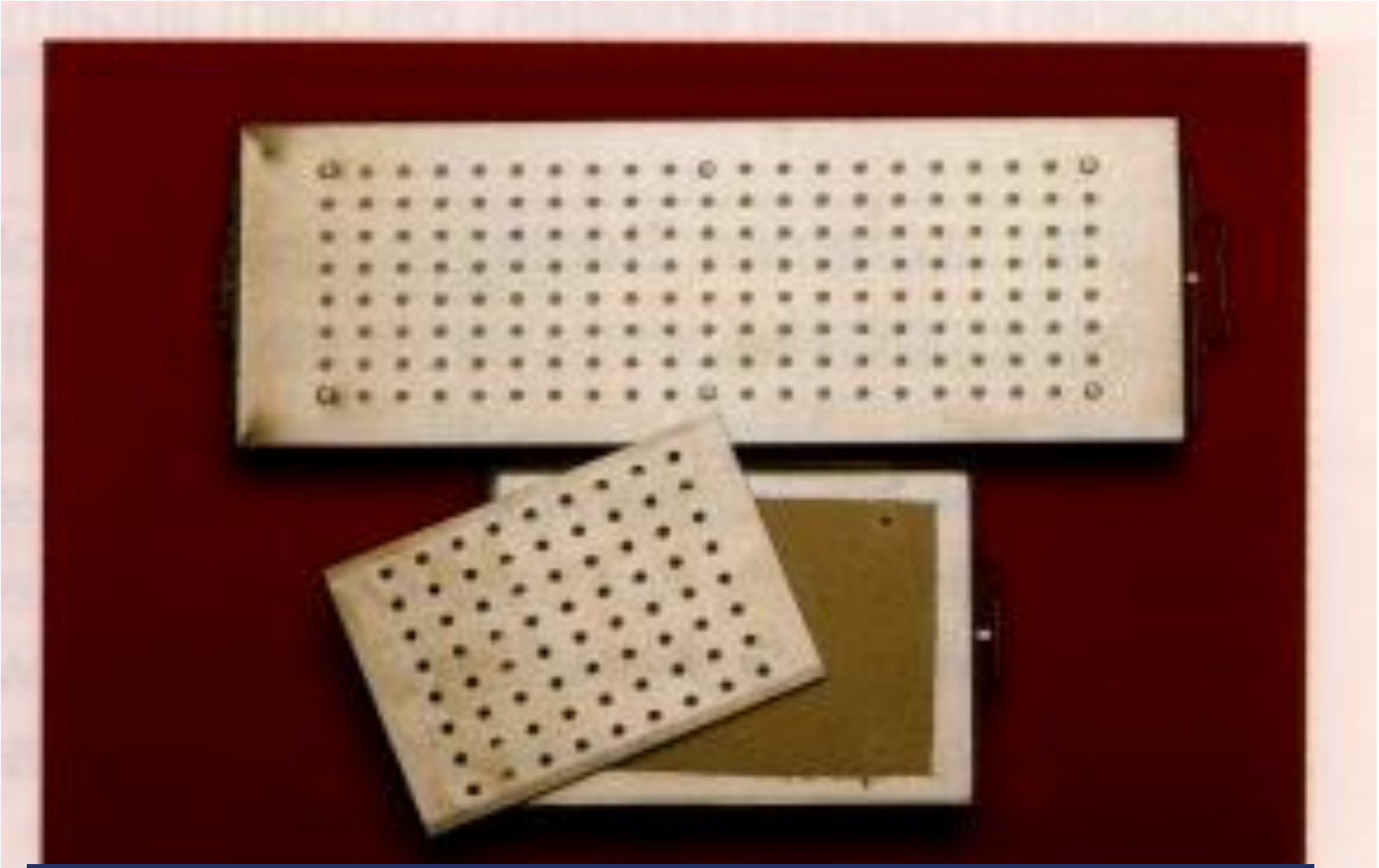
Custom packed instruments for sterilization

Autoclave (steam air sterilizing device)

Air oven sterilizing device


MDT Harvey
MDT Harvey
Chemiclave EC5500

Metal cassettes without perforation



Metal cassettes with perforation

Autoclaving with cassettes

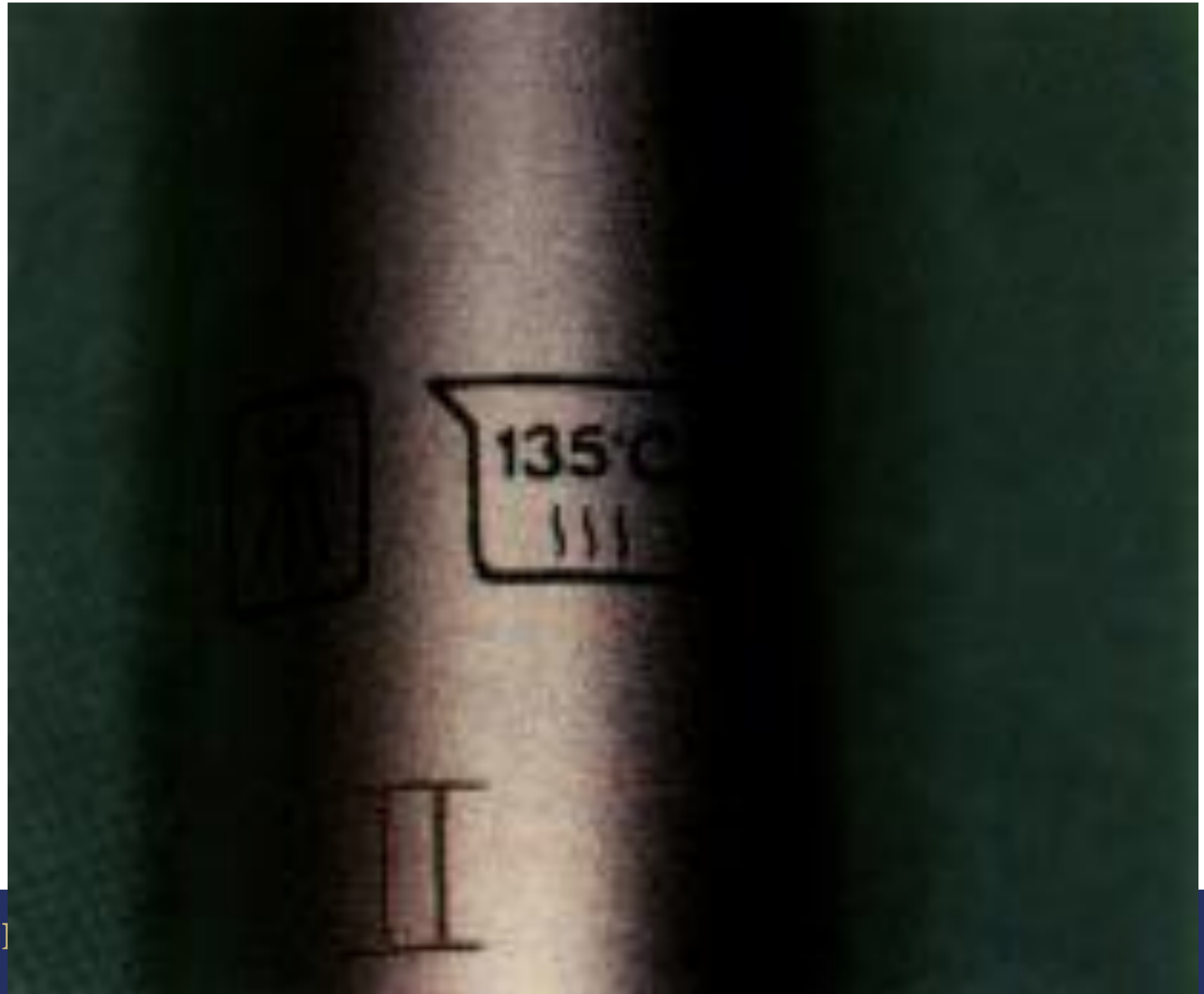
Suggested time and temperature sets for autoclaving

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

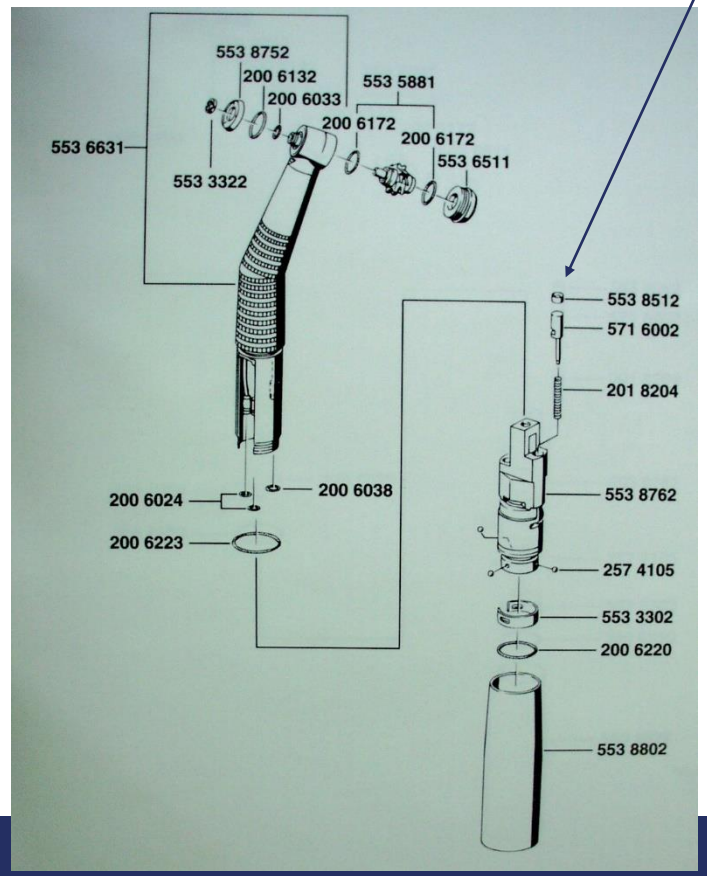
Storing burs

Ultrasonic cleaning of the endodontic insturments

Endocassette for sterilization and storing endodontic instruments


135°C

Antiretraction valve



Disinfection

- -is a generic term that refers to any , antimicrobial measure (regardless of the level of the outcome attained), using a product that exhibits *in-vitro* properties that meet the criteria of a disinfectant or antiseptic agent. The name of each disinfection procedure should indicate its application domain, for example, medical device disinfection, floor disinfection, and hand disinfection.

Disinfecting effect

- The act of disinfecting something.
  - Especially : the process of using a disinfectant (chemical, physical-chemical agents) to destroy, inactivate, or significantly reduce the concentration of pathogenic agents (such as bacteria, viruses, and fungi)
  - by proper activity and intensity in a determined time (acting time, exposition time)
- Aim of disinfection:
  - Prevention of the microorginism’s contact with the living organism

Fields of Disinfection

Oral cavity

Hands

Instruments, Equipment

Surfaces

Laboratory works

Air-water system of the dental unit

Textiles, surgery clothing

Disinfectant groups

Antiseptics

Less toxic substances used to slow or inhibit the growth of infectious microorganisms. Antiseptics are applied to external body surfaces, skin, mucosa,such as when treating minor wounds, when cleaning the skin prior to an injection, and when cleaning the hands.

Disinfectants

Toxic irritative and etching materials, their task is to destroy microbial agents that get into the environment from different infection sources. **They are used mainly for disinfection of tools, equipment, instruments and surfaces that can not be sterilized by the traditional methods**

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
  - Instruments are sterile
  - 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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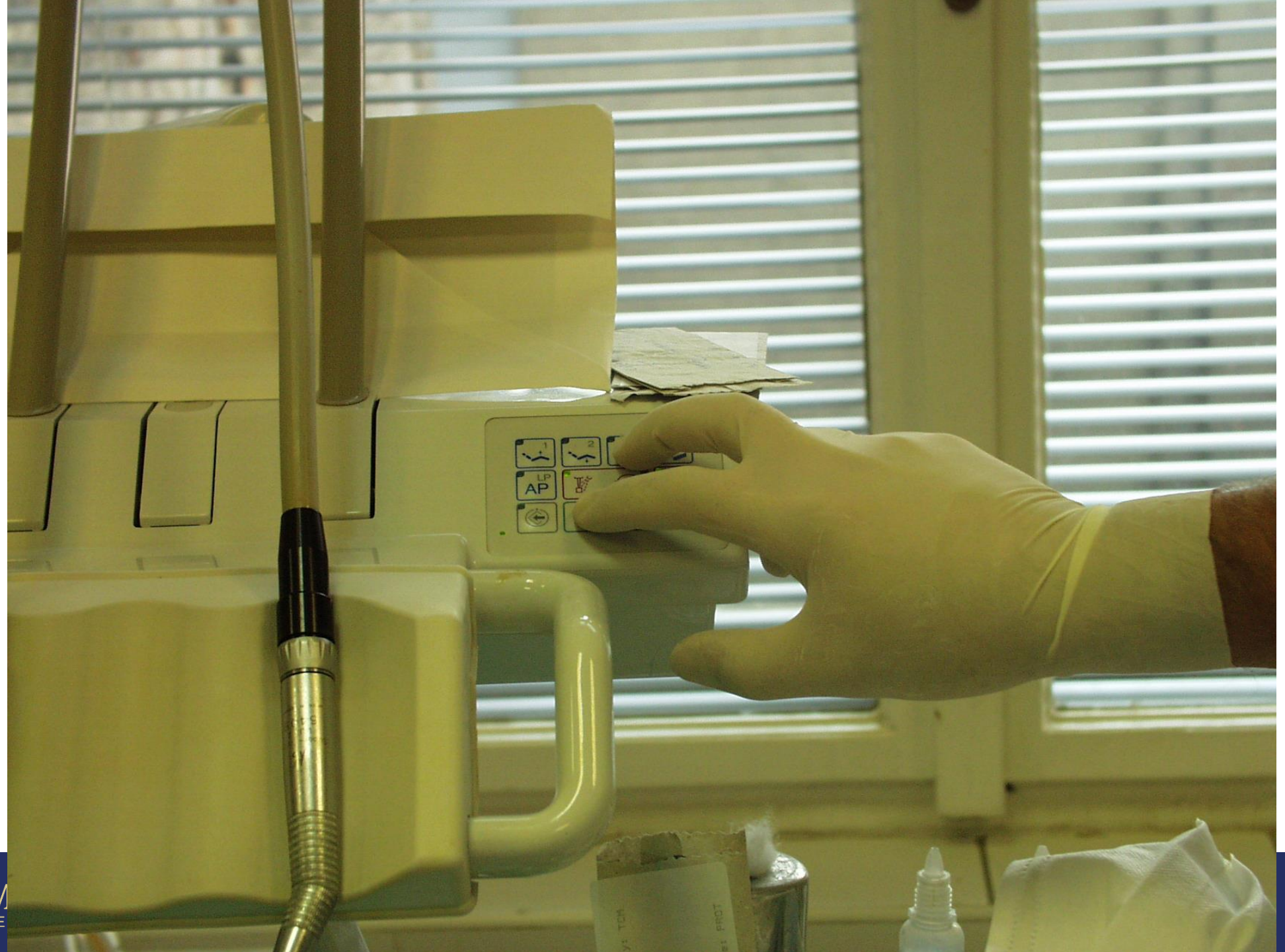
ALKOHOL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Remainder of the room

- 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 onto the surface, and the disinfectant left on the cleaned surface for at least 10 minutes, or less, according to the manufacturer's instructions, then wiped off with a clean tissue)


ELVÉGZETT KEZELÉS
Dátum

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 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!!