



The reprocessing of medical devices in Dentistry. Are there any differences to the reprocessing of surgical instruments?

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Fundamental principles

It is the basis of all medical intervention that all instruments which are used invasive (transection of skin or mucous membrane) into the patient's body **must be sterile.**

Microbiologically contaminated medical devices can be the source of infection in humans.

Therefore the use of such medical devices requires a previous treatment under defined requirements.

Fundamental principles

Proper instrument reprocessing demands numerous chemical and physical factors to prevent the spread of germs.

However, the required measures should only be carried out after considering the risks involved.

**in the mouth
there is no risk**

???

Definition

Risk is the potential of losing something of value. Values (such as physical health, ...) can be gained or lost when taking risk resulting from a given action, activity and/or inaction, foreseen or unforeseen. Risk can also be defined as the intentional interaction with uncertainty.

Risk perception is the subjective judgment people make about the severity and/or probability of a risk, and may vary person to person.

Any human endeavor carries some risk, but some are much riskier than others.

Hansson, Sven Ove, "[Risk](#)". *The Stanford Encyclopedia of Philosophy*. May 2014.

Definition

The Oxford English Dictionary cites the earliest use of the word in English (in the spelling of *risque*) as from 1621, and the spelling as *risk* from 1655.

It defines *risk* as:

(Exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility.†

In Dentistry: Risk of transmission of pathogenic microorganisms

Workspace microbiology

The mouth harbors a diverse, abundant and complex microbial community. This highly diverse microflora inhabits the various surfaces of the normal mouth, on both the hard and soft oral tissues in biofilms. Bacterial adhesion is particularly important for oral bacteria.

- Oral bacteria include streptococci, lactobacilli, staphylococci, corynebacteria, and various anaerobes in particular bacteroides.
- Yeast
- Protozoa

Workspace microbiology

Saliva is a watery substance located in the mouths of animals, secreted by the salivary glands. Human saliva is 99.5% water, while the other 0.5% consists of electrolytes, mucus, glycoproteins, enzymes, and antibacterial compounds such as secretory IgA (**Immunoglobulin A**) and lysozyme.

and:

Cells: possibly as many as 8 million human and **500 million bacterial** cells per mL.

Workspace microbiology

Blood:

- HBV
- HCV
- HIV
- Herpes simplex

Dangers for man and environment

Possible transmission:

- Aerogenically: Recording of bioaerosols through the mucous membranes of the respiratory tract
- Direct/indirect physical contact: effect on damaged skin / mucous
- Incorporation: absorption through the oral cavity
- Parenteral: penetration into deep tissues

in the mouth there is a risk!

Adequately described from a legal perspective as well as from occupational medicine:

- for the patient
- for the practice team (doctor and assistive personnel)

Risk Factors: Treatment Spectrum

Diagnostic assessment, controls, Orthodontics

- non-operative (mostly)
- no instruments with rotating components
- no aerosols



Risk Factors: Treatment Spectrum

Preserving therapy

- largely non-operative
- use of Instruments with rotating components
- aerosols
- partly under „dental dam“



Dental dam in place during a dental procedure.

Risk Factors: Treatment Spectrum

prosthetic / prosthodontic therapy

- partly operative/bloody
- use of Instruments with rotating components
- aerosols



Risk Factors: Treatment Spectrum

Oral Surgical interventions

- bloody
- use of sharp / pointed instruments
- use of instruments with rotating components
- aerosols



risk minimization

Each medical device must be "classified"

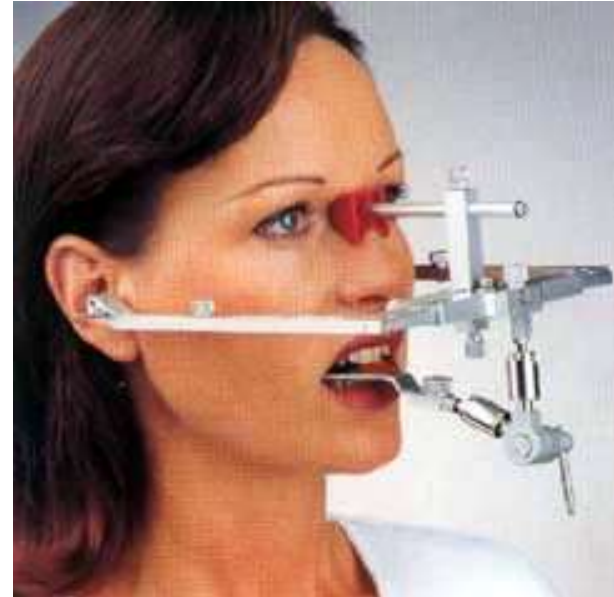
- non critical
- semi critical (A, B)
- critical (A, B)

The decisive factor is the intended use

Classification

Uncritical

only contact with intact skin



Classification

Semicritical A:

Contact with mucous membrane or pathologically changed skin:

WITHOUT special requirements for the processing

- instruments for general, preventive, restorative or orthodontic (non-invasive) measures.
- equipment having no leakage of liquids and / or air or particles



Classification

Semicritical B:

Contact with mucous membrane or pathologically changed skin:

WITH special requirements for the processing

- rotating or oscillating instruments for general, preventive, restorative or orthodontic (non-invasive) measures
- transfer instruments
- equipment having leakage of liquids and / or air or particles



Classification

Critical A:

Penetration of skin or mucous membrane

WITHOUT special requirements for the processing

- Medical devices for the use of blood, blood products and other sterile medicinal products
- Instruments and tools for surgical, periodontal or endodontic (invasive) measures



Classification

Critical B:

Penetration of skin or mucous membrane

WITH special requirements for the processing

- rotating or oscillating instruments for general, preventive, restorative or orthodontic (non-invasive) measures
- transfer instruments



„challenge“ rotating or oscillating instruments.....



„challenge“ rotating or oscillating instruments.....

- use of many different variations in dentistry
- use of different materials
- frequently inadequate manufacturer's instructions regarding possible application and processing
- corrosion
- thermolabile

**Are there any
differences to the
reprocessing of
surgical
instruments?**

Fundamental principles

CLEAN

residue-free medical devices after cleaning so that the subsequent steps of disinfection and sterilization are not adversely affected by blood, secretions and residual tissue, for instance.

DISINFECTED

the disinfection methods must be verifiably bactericidal, fungicidal and virucidal

Fundamental principles

Machine based decontamination in a washer-disinfector

- more safety for personnel (infection, injury)
- reproducible processes and results
- standardisation of process possible
- **validation of process possible**
- **meets requirements of international standards**

→ **preferable process**

Fundamental principles



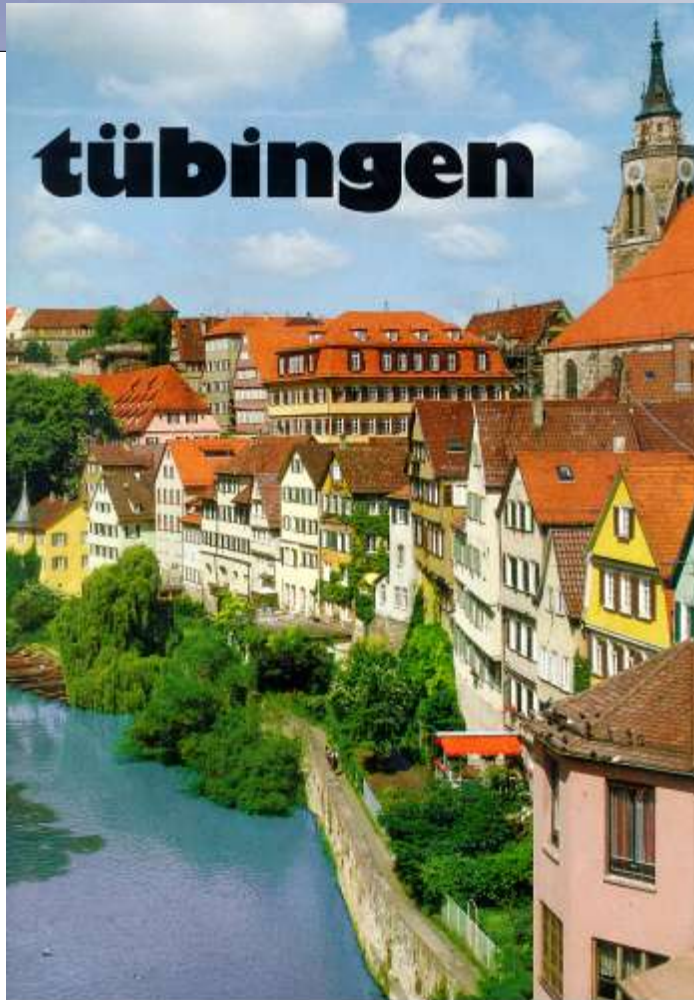
A sterile medical product **must be free of viable microorganisms** (Definition: ISO 17665-1).

- The degree of 'sterility' can be quantified as an SAL= **1×10^{-6}**

**Reprocessing of medical devices in Dentistry.
Are there any differences to the reprocessing of surgical instruments?**

Important: Never forget the RISK





Thank you very
much

My special thanks go to Dr. Torsten Meyer-Elmenhorst for input, pictures and ideas