Cleaning & Disinfection Instruments

Eng. Reyad Al-Darawsheh
BODE Consultant for ME and GCC

Disinfection and Sterilization?

- Sterilization: killing of all MicroOrganism mainly by Heat or Gaz Sterilzation
- Disinfection: Killing of MicroOrganism by using chemicals (Disinfectants)
- Cleaning: is removing dirts only.

Instruments

- All instruments that penetrate the body through the skin and cause injury and mixed with blood circulation has to be sterilize
- All instruments that penetrate the body without causing injury or mix with blood circulation needs high level disinfection
- All instruments that comes in contact with the skin without penetrating the body needs low level disinfection

Types of Instruments

* Surgical and ward instruments
  drillers, sciccors, tongs, scalpels
* Rigid and flexible endoscopes
* Intensive care and anaesthesia materials
  (plastic, rubber)

Two standard applications

* Washing maschines
  → chemo-temperature treatment

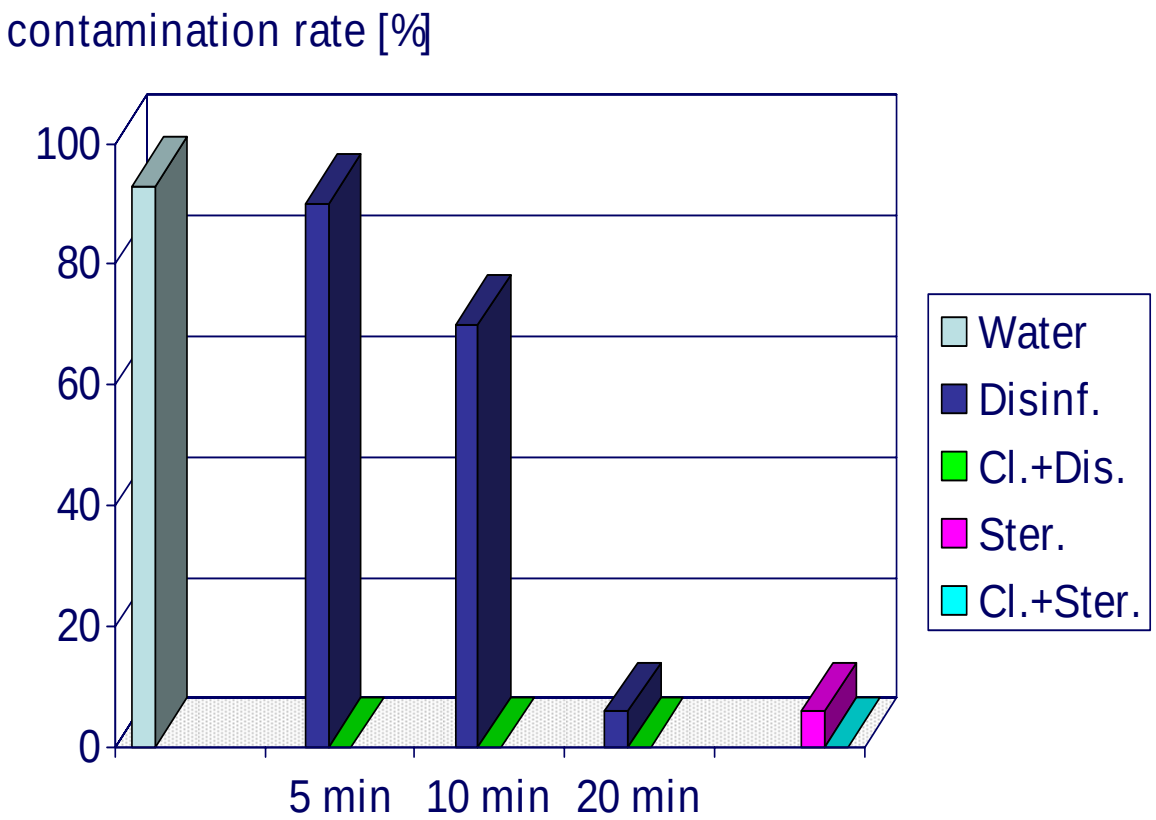
* Immersion procedure (manual processing)
  →

Instruments

- We must clean instruments before disinfection?
- Why?????

HBV-contamination: Success (failure) in disinfection

Study with angioscopes after contamination with duck-HBV



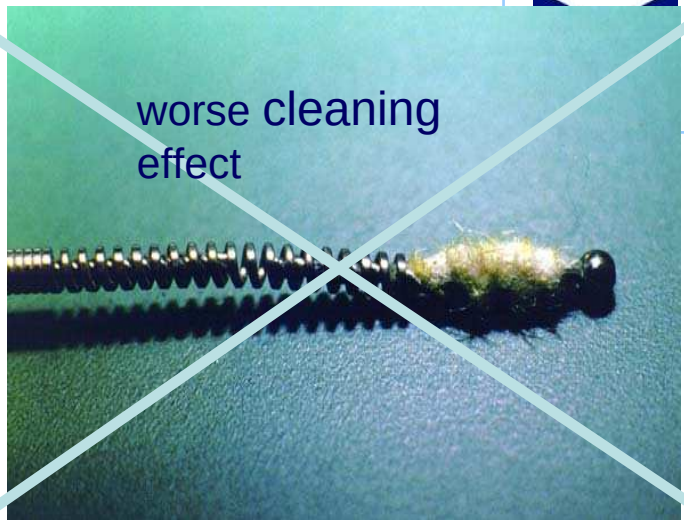
Disinfection : GDA, 2%ig
Sterilization: Ethylenoxid, 6h

X. Chaufour et al., Evaluation of disinfection and sterilization of re-usable angioscopes with the duck hepatitis B model J.Vasc. Surg. 1999; 30: 277 -282

Influence of cleaning

Mechanical pre-cleaning

of the channels with an adequate brush



Influence of cleaning

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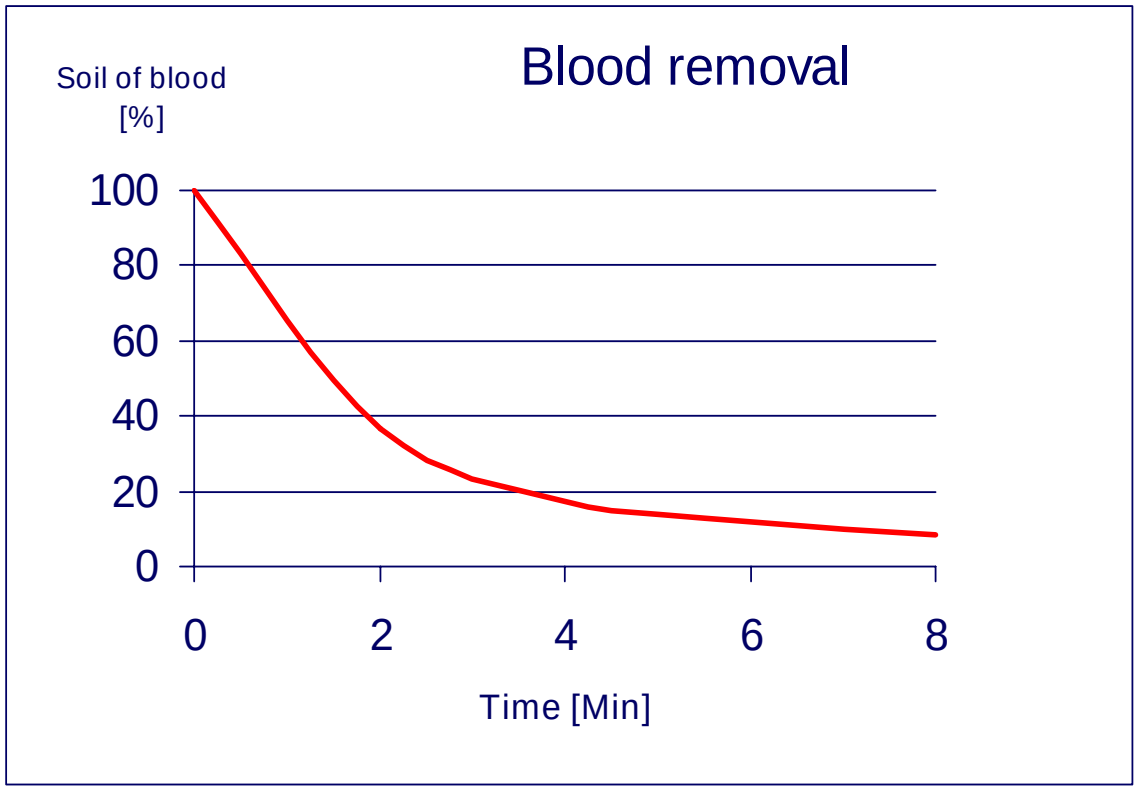
Application time



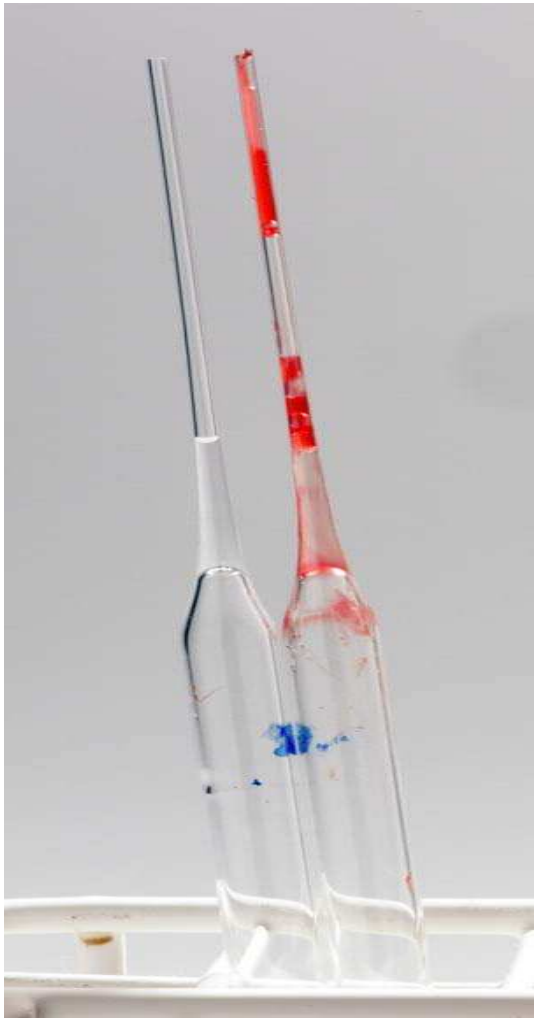
Circulation procedure in room temperature,
1% solution of cleaner,
dried blood,
(BODE-internal investigation 1999)

Dried blood removes very slowly !

Clean immediately after use !

Influence of cleaning

Interaction of blood with cleaner and disinfectant



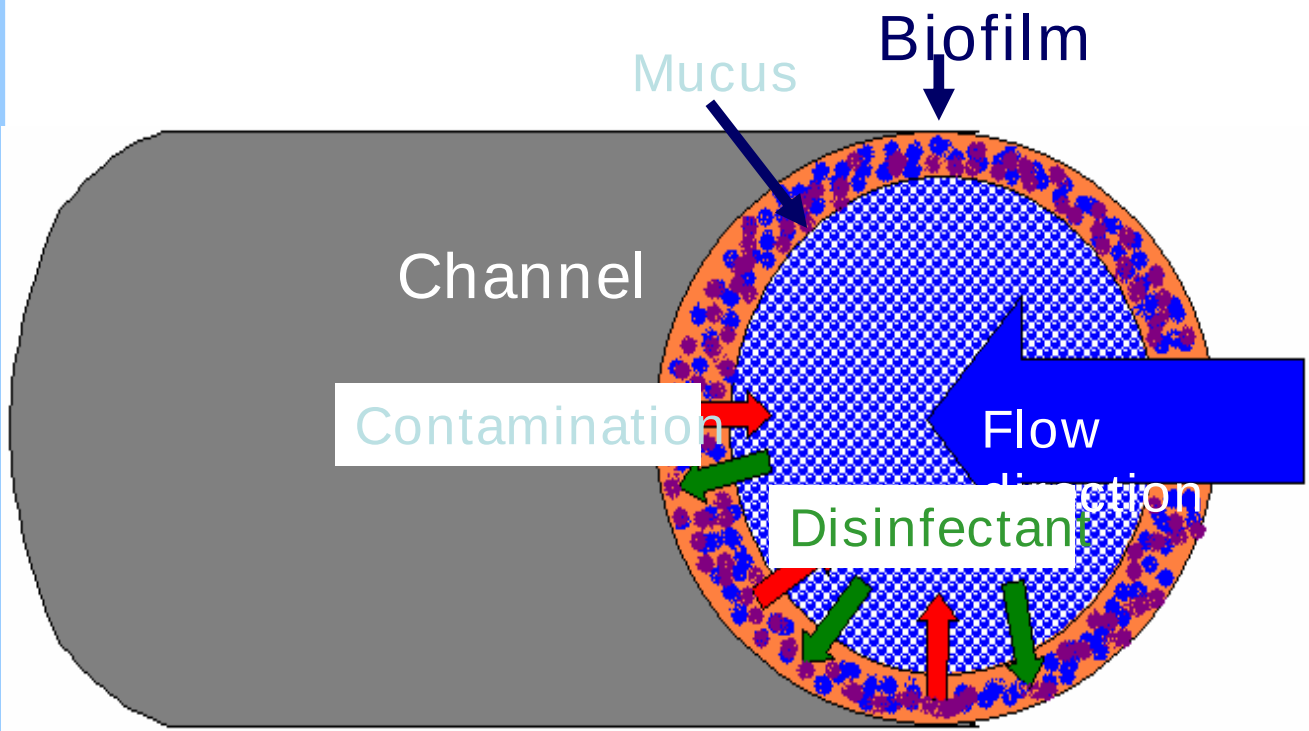
Glass capillary:
left: cleaned with Bodedex forte, disinfected with a glutaraldehyde containing disinfectant
and rinsed with water

right: cleaned and disinfected with a glutaraldehyde containing disinfectant and rinsed with water

Working without cleaner, blood coagulates and cannot removed from channel systems

Influence of cleaning

Interaction of biofilm with cleaner and disinfectant



Bacteria within biofilms are very resistant to disinfectants !
A good pre-cleaning is important !

Influence of cleaning

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Other influences of a good cleaning:

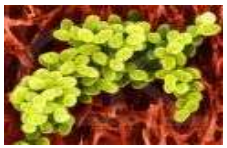
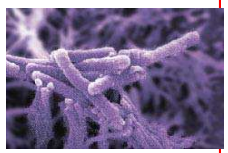
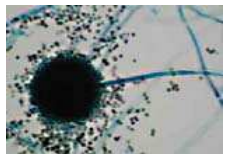
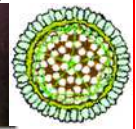
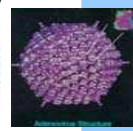
Low foaming property

Neutralize hard water

Good compatibility with all materials

Neutral pH-value

Active ingredients

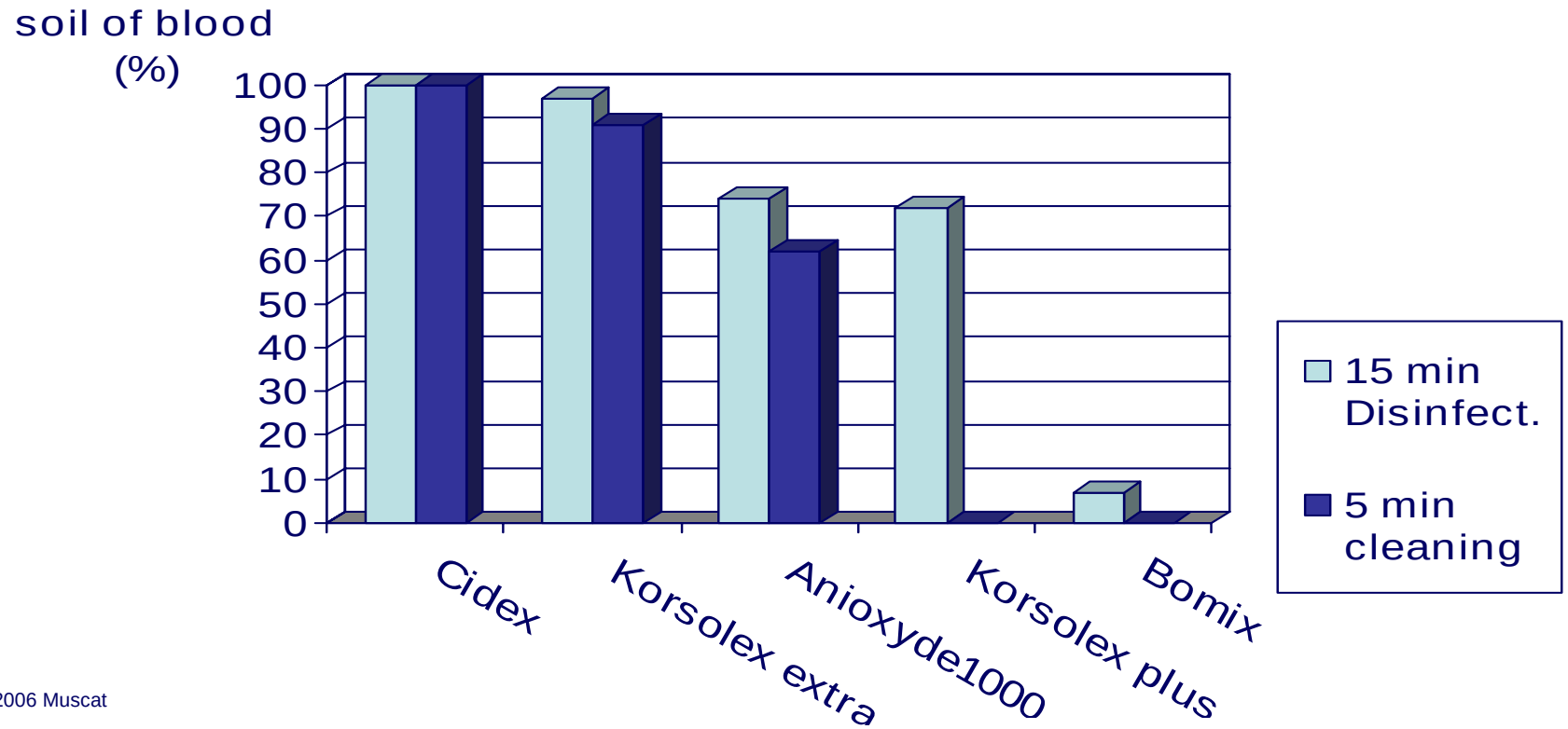
	Gram neg. Bacteria 	Gram pos. Bacteria 	Myco-bacteria 	Fungi 	Spores 	Virus envelopped (HBV/HIV Vaccinia, Herpes)  	Virus not envelopped (Polio Rota, Papova, Adeno)  
Form-aldehyde	+	+	+	+	+	+	+
GDA	+	+	+	+	+	+	+
QAC	+	(+)	-	(+)	-	+	(+)
Amine	+	(+)	+	(+)	-	+	(+)
Peracetic acid	+	+	+	+	+	+	+
Phenole	+	+	+	(+)	-	(+)	-

Aldehydes und Peracetic acid have the best microbicidal spectrum, but ...

Fixing blood

model of soil with dried blood on metal plates

The metal plates had been disinfected (15 minutes), then cleaned with a alcaline cleaner (5 minutes)



Fixing blood - optical results

model of soil with dried blood on metal plates, some exemples

Influence on blood of a aldehydic products

Influence on blood with products based on peracetic acid

These two product-types have a fixing effect of proteins.
Peracetic acid decolourize the blood !

Fixing blood - optical results

model of soil with dried blood on metal plates, some exemples

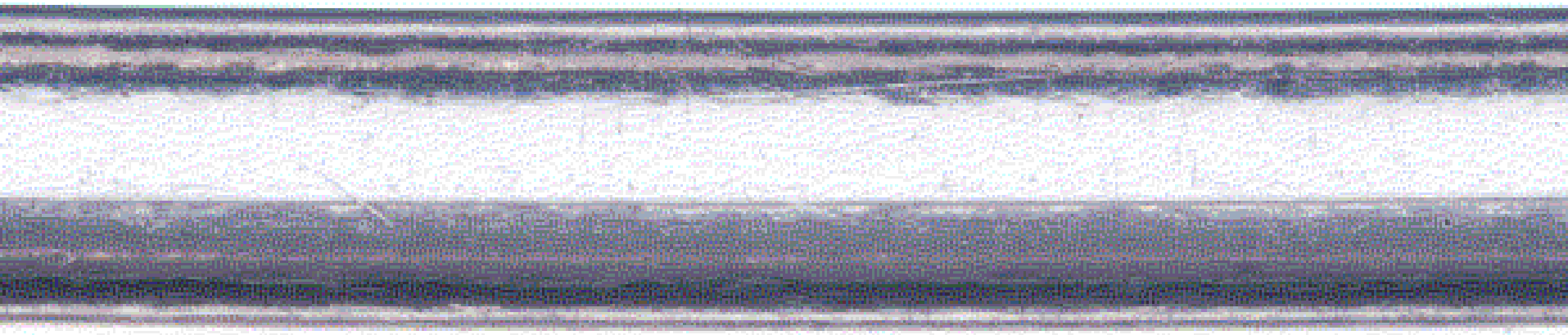
Influence on blood of a product with QAC and a alkylamin

Influence on blood with a phenolic product

These two product-types havn't any fixing effect on proteins. All soils are removed !

Fixing blood - situation unter practical conditions

Some exemples of channels from endoskopes which had been reprocessed under different conditions



Automatic chemo-thermic reprocessing with a aldehydic product, manuell precleaning

→ The channels are normally clean

Fixing blood - situation unter practical conditions

Some exemples of channels from endoskopes which had been reprocessed under different conditions

Manuell reprocessing under aldehydic conditions

→ Heavy fixation

Practical issues / endoscopes

- Ensure that all surfaces and hollow cavities are completely wetted by the disinfectant solution. Air bubbles must be eliminated.
- The prescribed concentrations and contact times must be adhered to.
- Particular care must be given to the cleaning and disinfection of the channel systems. Attention must be paid to both the biopsy channel and the air and rinse channels, the storage container for rinse solutions and the relevant tubing.
- After disinfection, rinse thoroughly with demineralised water or water at least of drinking water quality, and dry.
- Danger of recontamination! Store endoscopes only when dry, and protect against recontamination until re-use!

Summary

Aldehydes are fixing proteins

QAC and Alkylamines havn't any fixing effect

Safety by careful cleaning

Peracetic acid is fixing proteins

Phenolic, amines substances hav't any fixing effect

Thank you and wish you all the best