



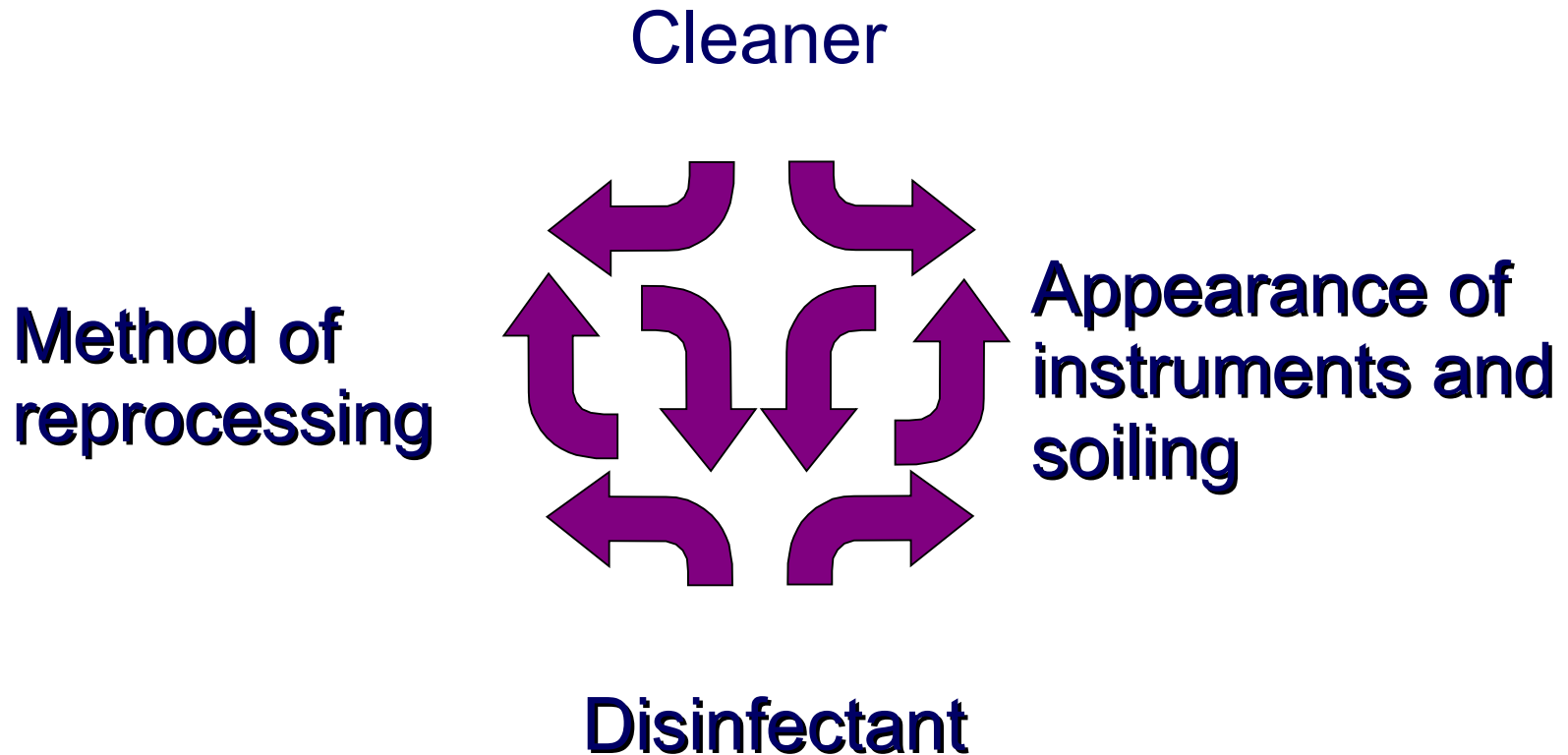
The role of cleaning in the manual reprocessing of medical devices and quality assessment of different cleaners

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BODE CHEMIE HAMBURG
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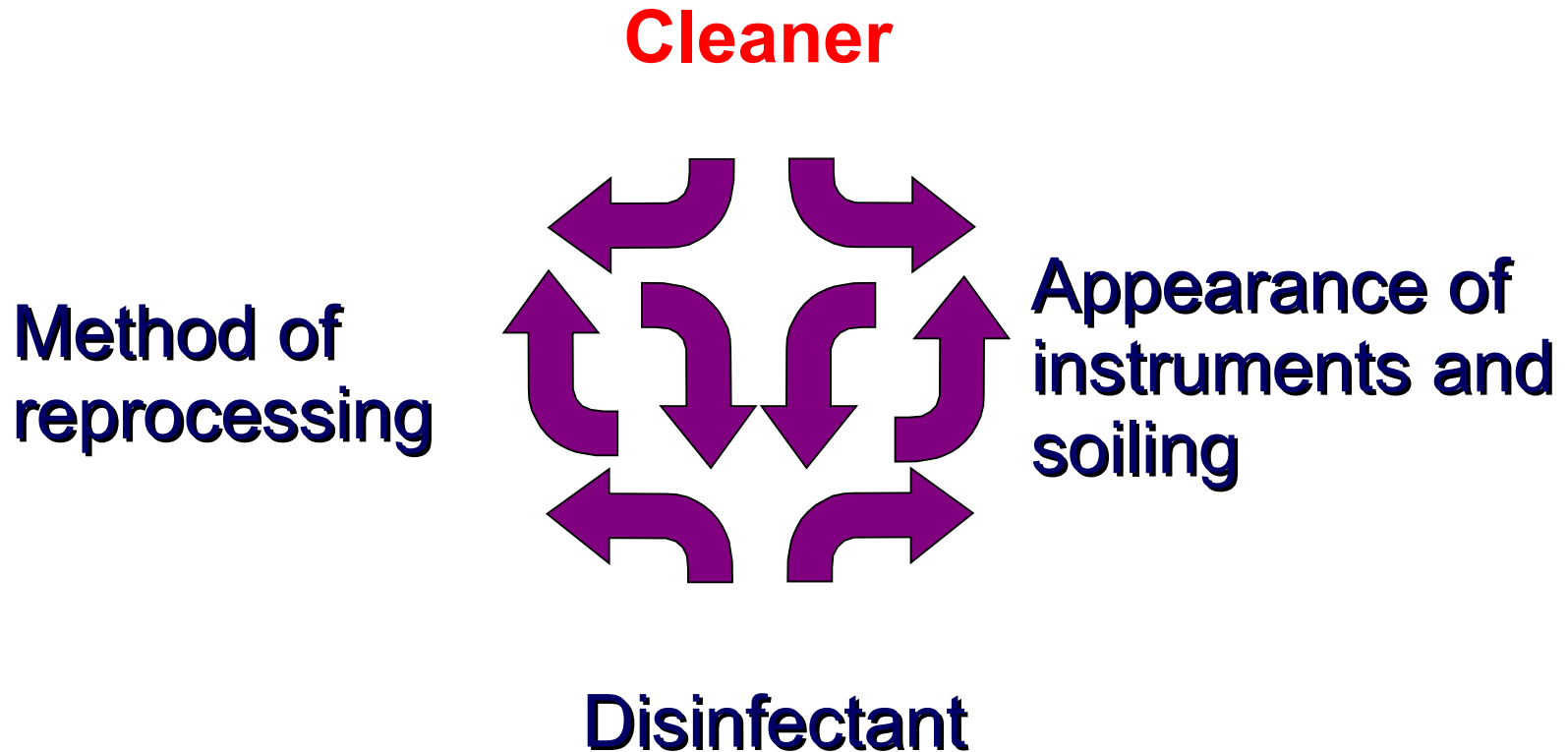
Instrument Cleaning

- ◆ **Introduction**
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Influence on reprocessing success



Influence on reprocessing success



National guidelines and recommendations differ



Switzerland



France



USA



Germany



Europe

Introduction

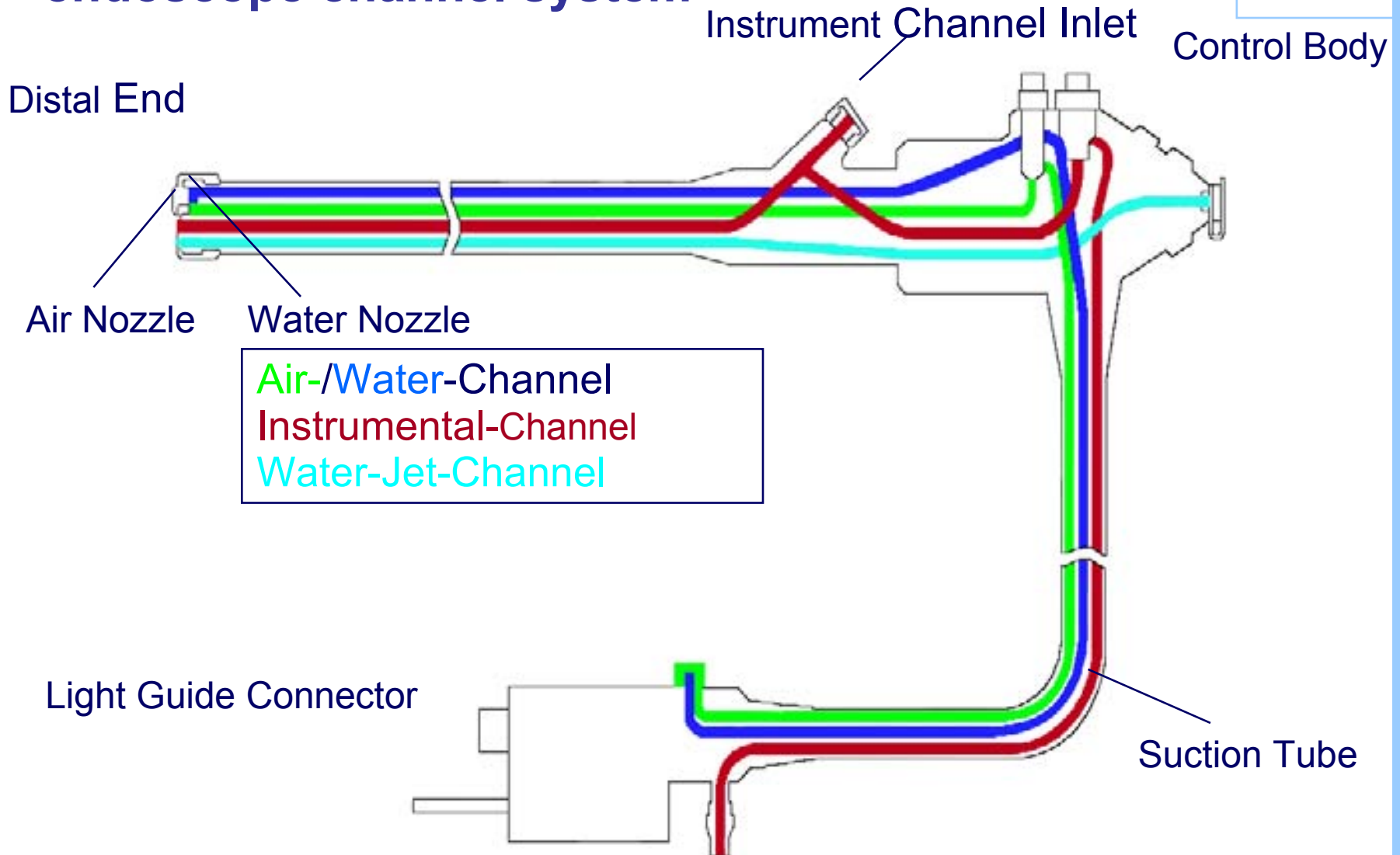
In recent years, national guidelines have started to acknowledge the importance of thorough cleaning before the use of disinfectants

SFED-recommendation on reprocessing flexible endoscopes (06/2002)

RKI-recommendation on hygienic reprocessing of medical devices (11/2001)



Construction of the interior endoscope channel system



Residues on instruments

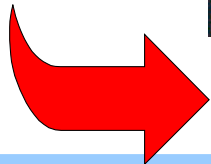
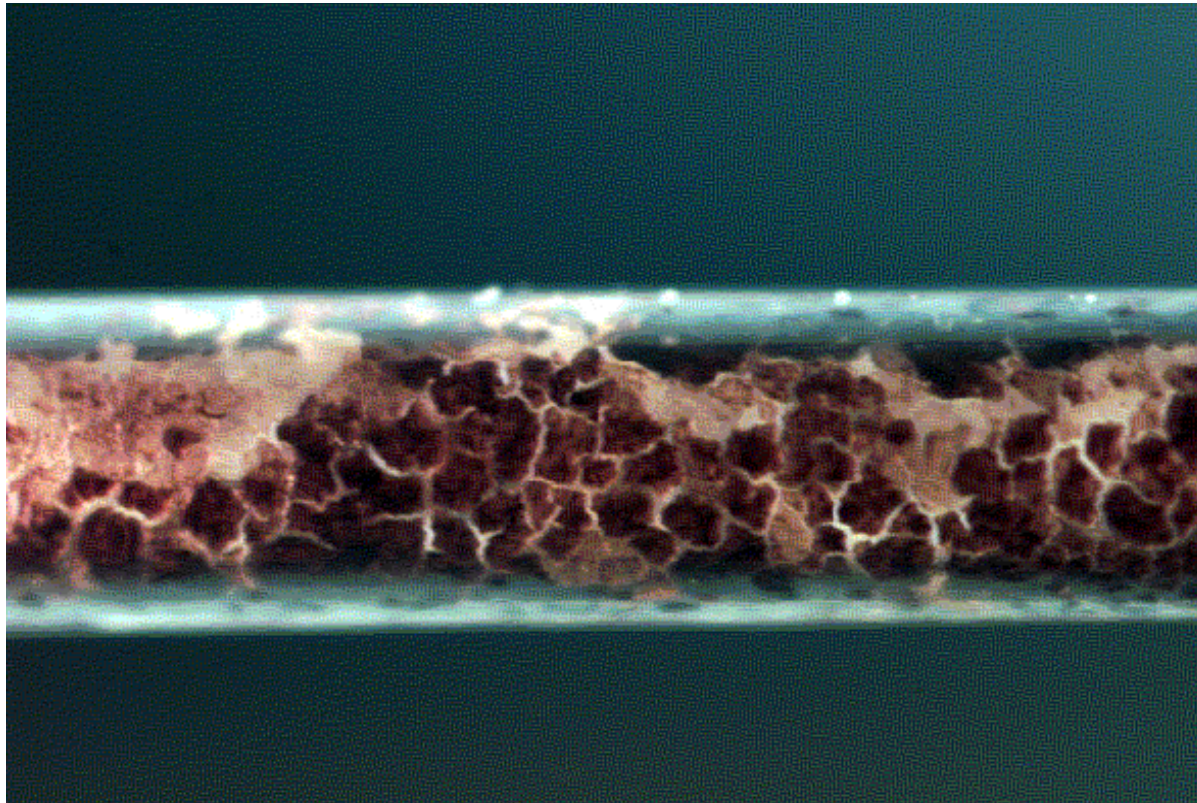
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Insufficient cleaning:

Coloscope, air-channel
very heavy soiling

BODE-internal investigation
of different channels from
endoscopes in maintenance 1999



Thorough pre-cleaning is indispensable!

Residue of X-ray contrast media



 **IDEAL nutrient base !**

Dilemma in cleaning:

- no standardized / required tests
- no defined cleaning power
- no European standard protocol for cleaning (e.g. brushing)
- no European norms for cleaners



The simple fact that a product is called "cleaner" does not have any significance

What kind of cleaner is really inside?



- no tests
- no norms
- no standards

...a question that merits closer examination....

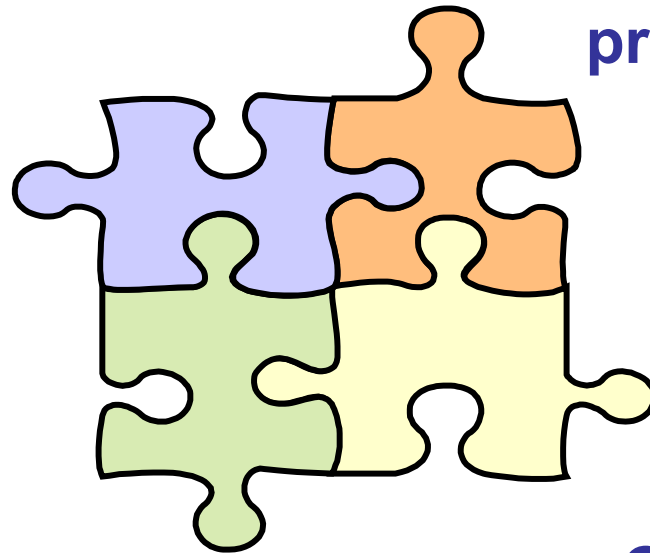
Requirements

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**Optimisation of
cleaning of
biofilms**

**Optimisation of
cleaning of
proteins**

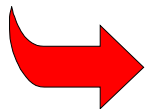
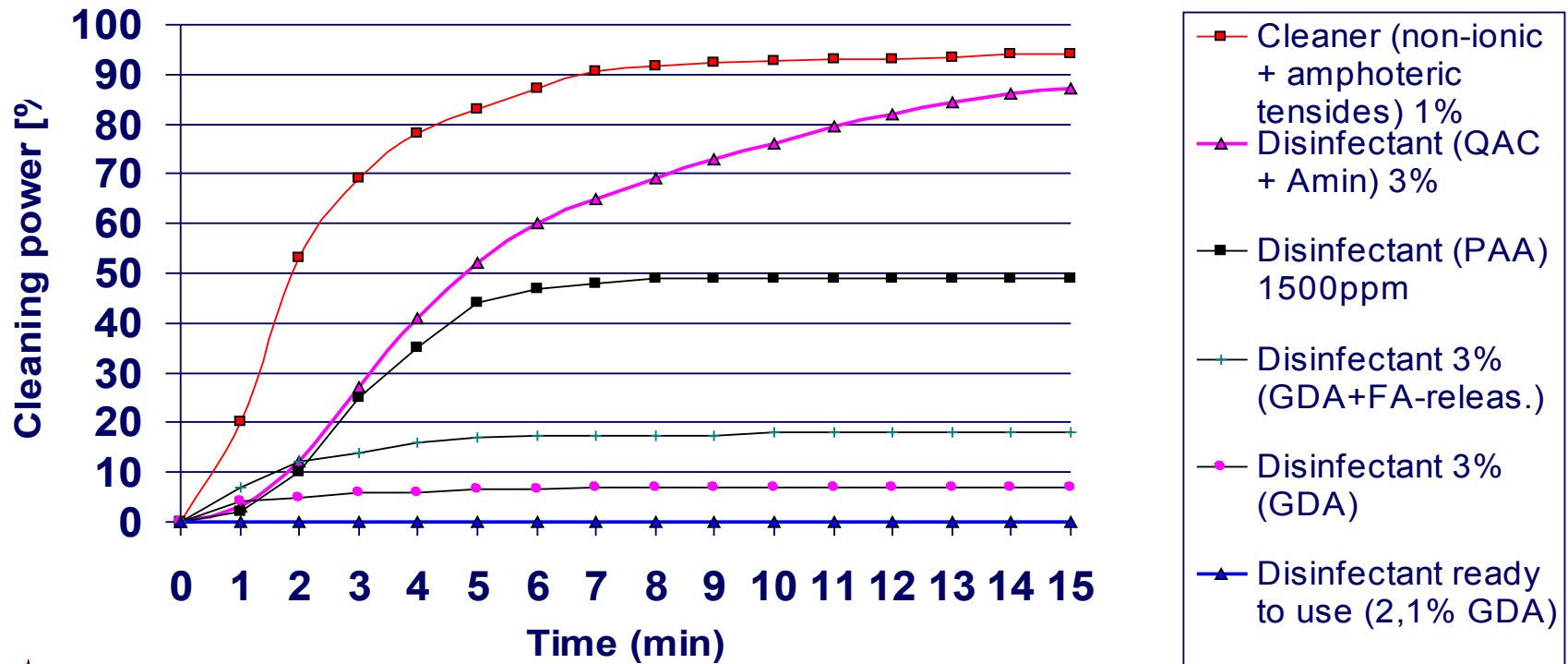


**Tests in
clinical
practice**

**Compatibility
tests with
suppliers of
instruments**

Cleaning results: Proteins

External in vitro investigation with different products, test on metal plates, contaminated with a standardised blood contamination (dried blood)



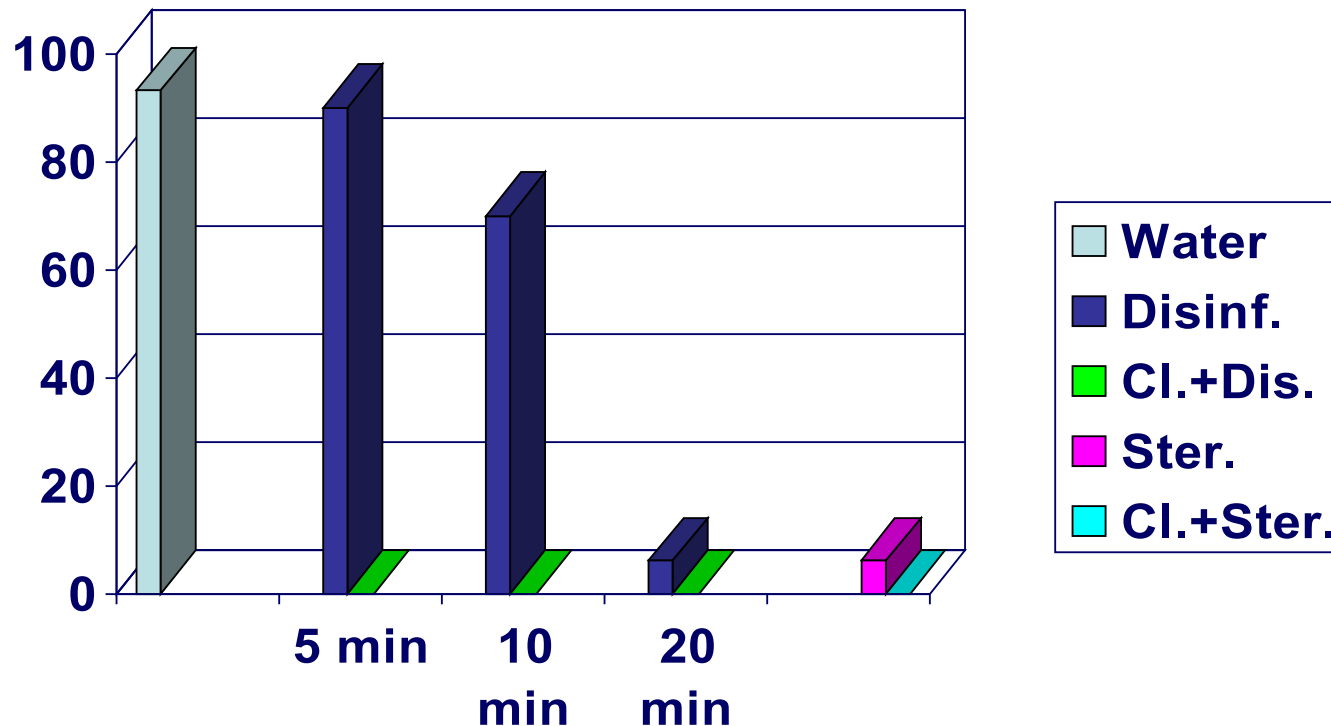
aldehydic and peracetic acid products left remarkable protein soil !

HBV-contamination: Success (failure) in disinfection

Study with angioscopes after contamination with duck-HBV

contamination rate [%]

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

Cleaning results: Proteins

Proving the Fixation

15 minutes in a disinfectant (DGHM-conc.)

immerse in dist. water

Results 1

5 minutes in a agitator (200 rds/min)
in a alkaline cleaner 1%

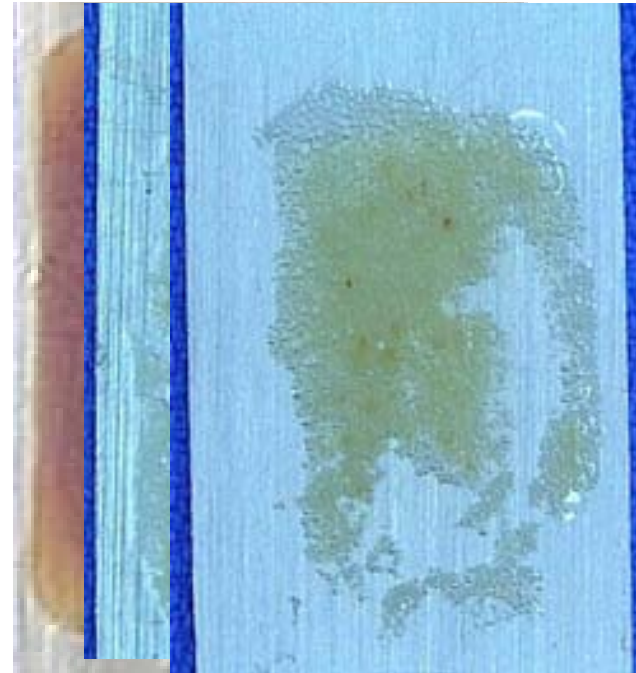
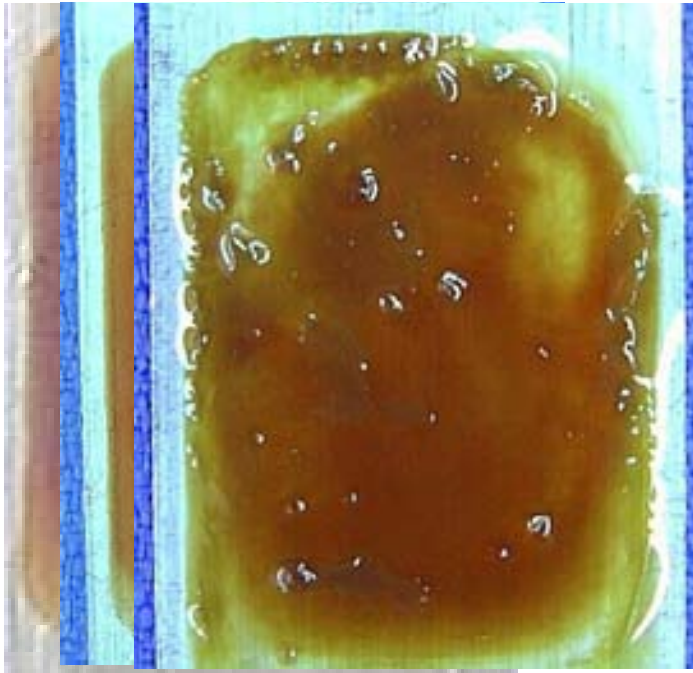
immerse in dist. water

Results 2



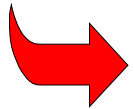
Cleaning results: Proteins

Fixation of blood on metalplates



ALDEHYDES

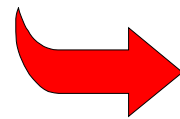
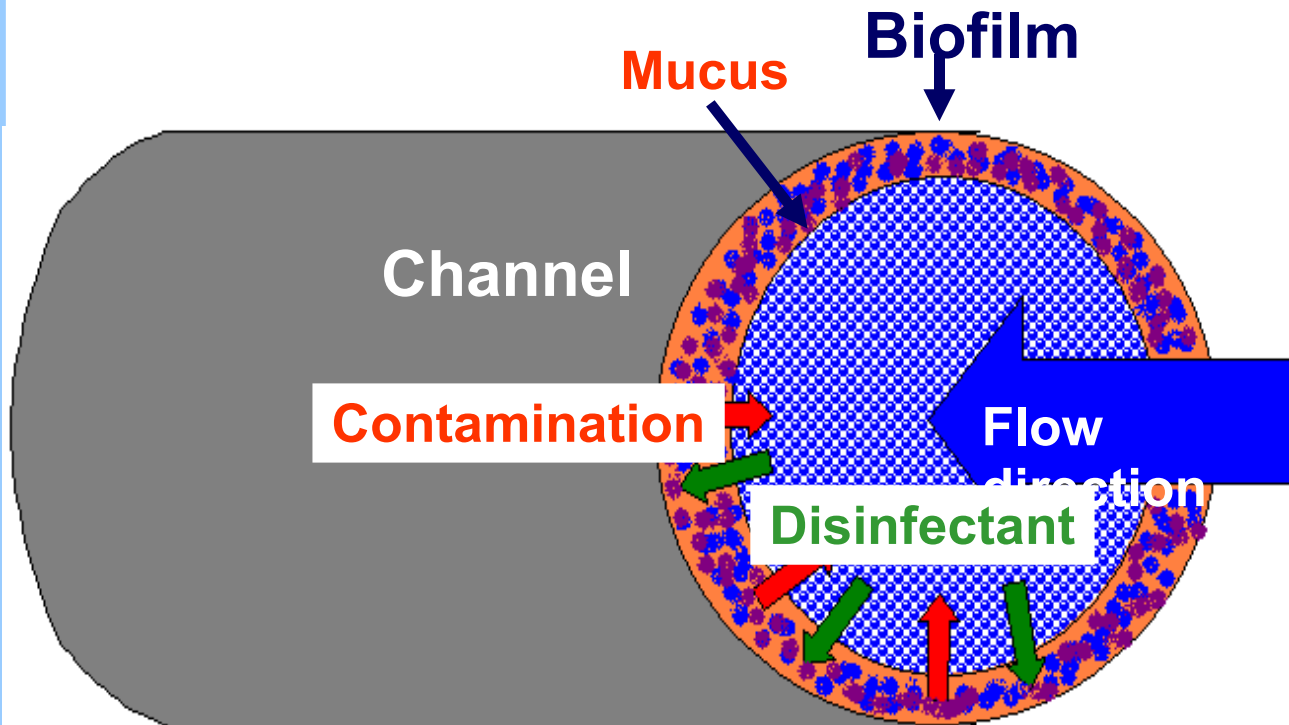
PERACETIC ACID



Both active ingredients are not suitable for cleaning!

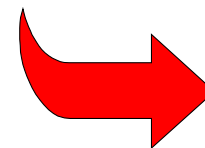
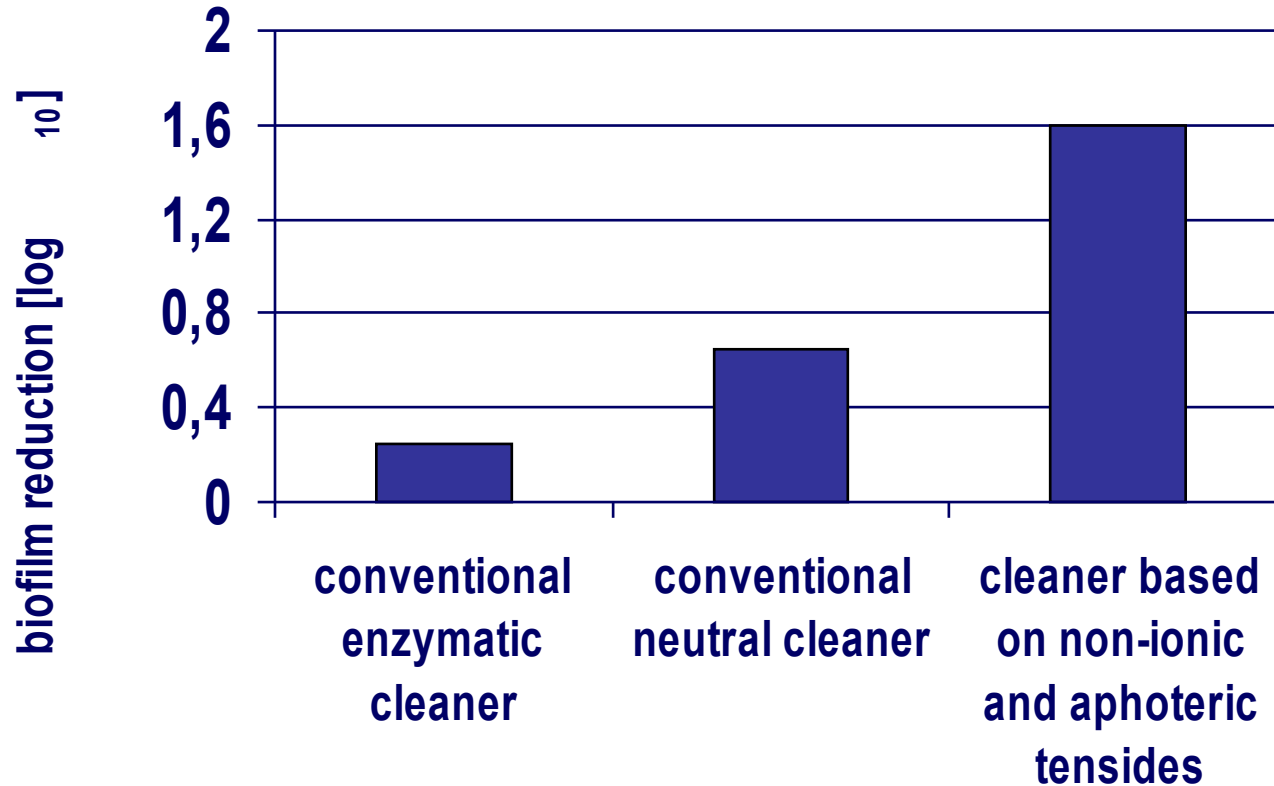
Cleaning results: biofilm

Interaction of biofilm with cleaner and disinfectant



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

Cleaning results: biofilm

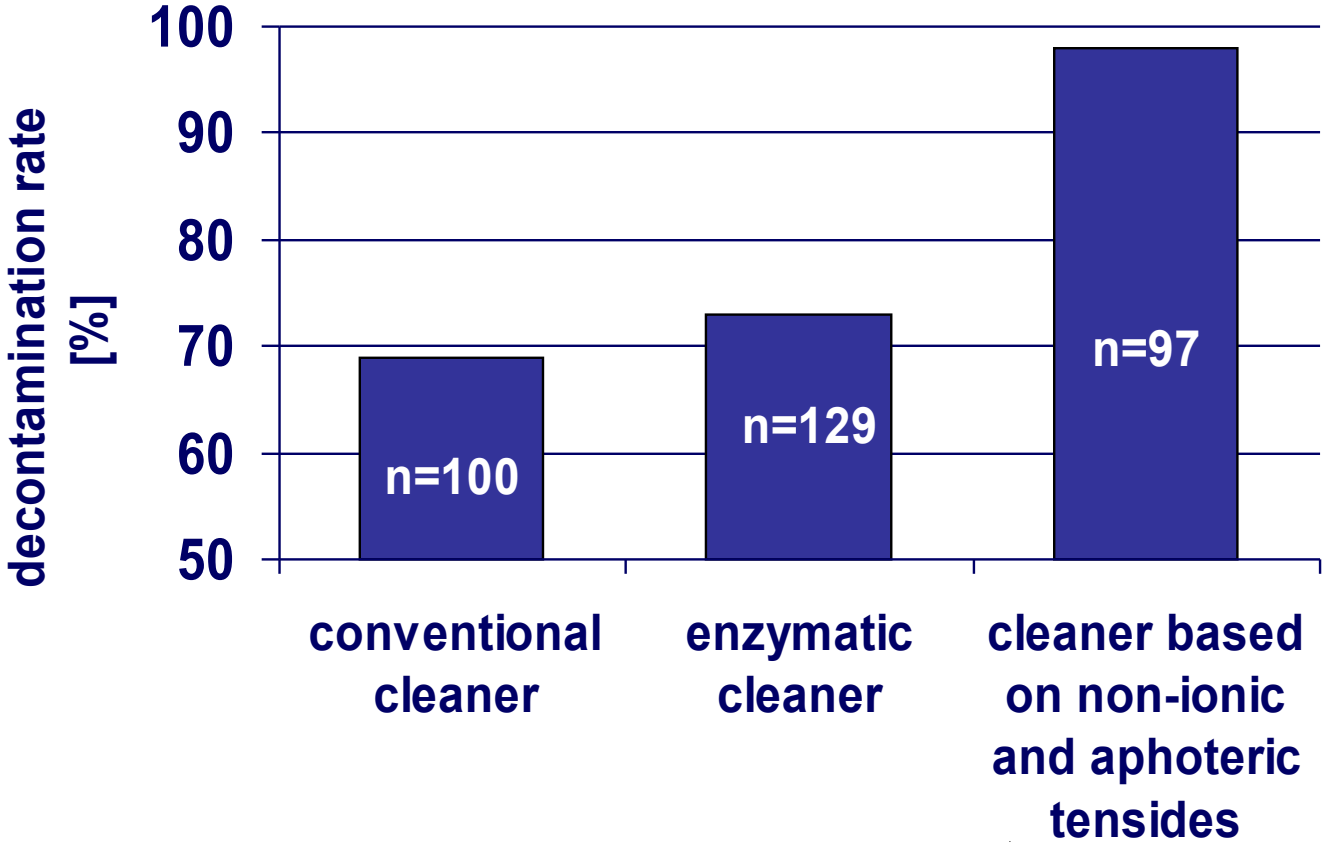


There is a huge difference in reduction of biofilms!

Cleaning results in clinical practice



Duodenoscopes



 Significantly better!

Source: Endopraxis, 2000, 02: 18 - 20

Microbicidal efficacy incl. cleaning performance

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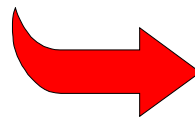
Interaction of blood with cleaner and disinfectant



Glass capillary:

left: cleaned with cleaner based on non-ionic and aphoteric tensides, 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

Microbicidal efficacy incl. cleaning performance

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Product based on aldehyde-free aliphatic amines



sheep blood
B. subtilis
Staph. aureus
metal plate



disinfection 15 min.
thorough rinsing
tap water
final rinse
sterile water



grinding
with sterile
quartz sand



microbial
activity

Product based on glutaraldehyde 2%



Microbicidal efficacy incl. cleaning performance

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Staph. aureus - results

	Control (mean of 4)	Product based on aliphatic amines (mean of 4)	Product based on glutaraldehyde 2%* (mean of 4)
cfu [log10]	6.03	0	3.43
reduction factor	-	6.03	2.60

⇒ Product based on aliphatic amines with good cleaning power confirms microbial efficacy, aldehydic product without cleaning power fails

* This test design is not relevant in case of clean instruments

Microbicidal efficacy incl. cleaning performance

BODE-SCIENCE-COMPETENCE



B. subtilis - results

	Control (mean of 4)	Product based on aliphatic amines (mean of 6)	Product based on glutaraldehyde 2%* (mean of 6)
cfu [log10]	6.28	4.12	5.14
reduction factor	-	2.16	1.14

⇒ Product with good cleaning power and no sporicidal activity shows better performance than the sporicidal aldehydic without cleaning power

* This test design is not relevant in case of clean instruments



**Safety by careful
cleaning**