NAVIGATING THE MAZE OF DISNFECTANTS: WHAT TO LOOK OUT FOR

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DISINFECTANTS ARE REQUIRED FOR :-

Heat sensitive instruments and equipment

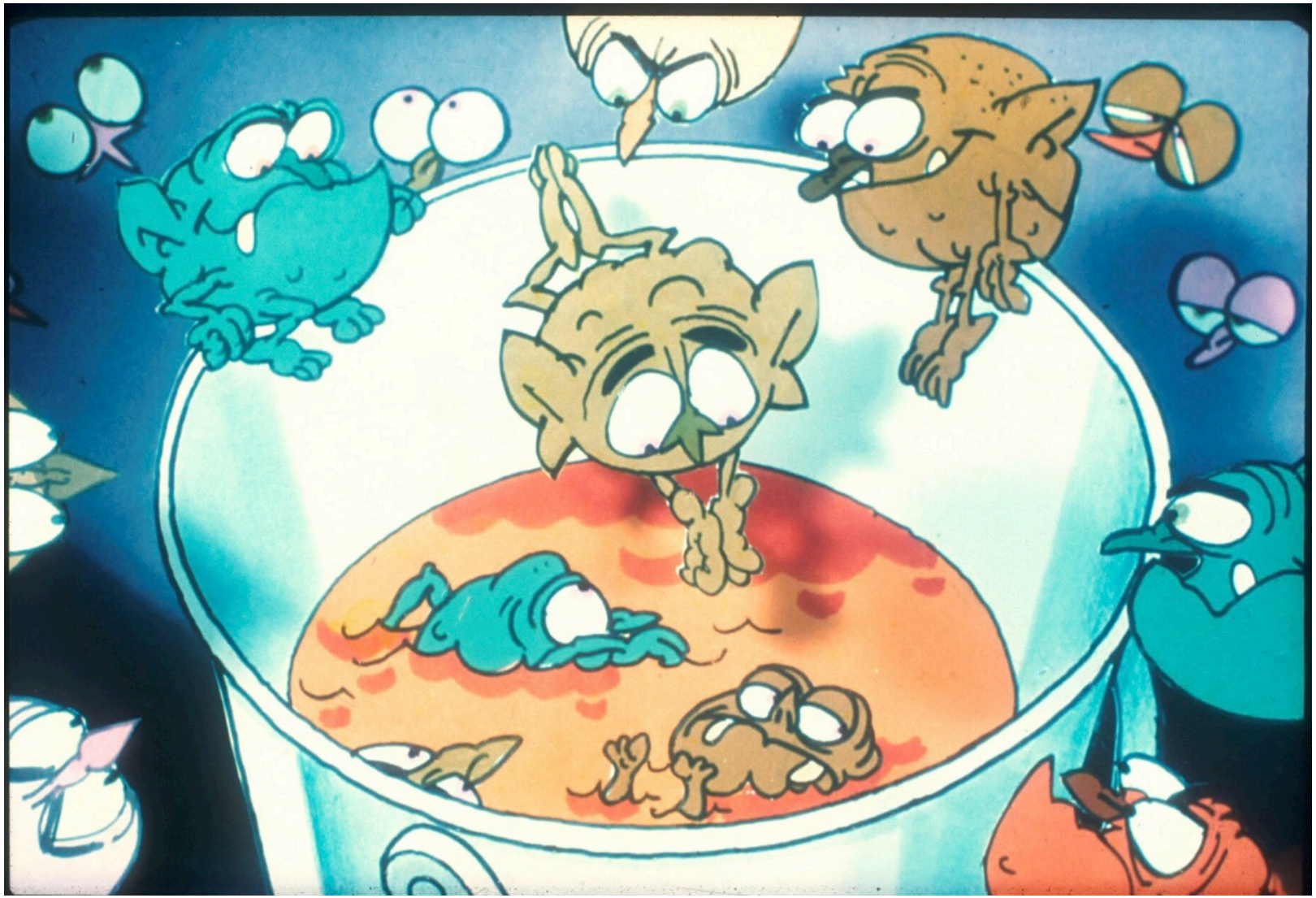
e.g. flexible endoscopes, electrical items

Environment

e.g. body fluid spills, worktops, mattress covers, baths

Skin and mucous membranes

e.g. hands, operation site, MRSA carriers



CONSIDERATIONS WHEN CHOOSING A DISINFECTANT

- Range of activity
  - What does the product kill?
- Rate of kill at use dilution
  - What is the contact time? Is it achievable?
- Health and safety
  - Is PPE required to use the product?
- Compatibility
  - Do the manufacturers of the device/equipment recommend use of the chemical?
- Inactivation by organic matter
  - Is cleaning essential prior to use?
- Stability
  - Can the product be prepared and stored?
- Cost

RANK ORDER OF RESISTANCE TO DISINFECTANTS

Bacterial spores
Mycobacteria
Non enveloped viruses
Fungi
Gram negative bacteria
Gram positive bacteria
Enveloped viruses

MANUFACTURERS CLAIMS

99.9%

99.99%

BUT WHAT DOES THIS MEAN?

90%	1 Log_{10} reduction
99%	2 Log_{10} reduction
99.9%	3 Log_{10} reduction
99.99%	4 Log_{10} reduction
99.999%	5 Log_{10} reduction
99.9999%	6 Log_{10} reduction

EUROPEAN STANDARDS

Phase 1

Suspension tests for the basic activity of the product (e.g. EN 1040)

Phase 2/step 1

Suspension tests under conditions representative of practical use (e.g. EN 13727, EN 14476)

Phase 2/step 2

Other laboratory tests e.g. hand wash, handrub, and surface tests simulating practical conditions (e.g. EN 1499, EN 1500)

Phase 3

Field tests under practical conditions

TEST REPORT

Should include

- Objective
- Product details – concentration tested etc.
- Test method
  - Organic load
  - Contact times
  - Test temperature
- Validation testing
- Results
- Conclusion
- Test requirement

EN 14885 (2006) STANDARD TEST METHODS TO BE USED TO SUBSTANTIATE CLAIMS FOR DISINFECTANTS USED IN THE MEDICAL AREA

Type and/or purpose of product	Activity claims							
	Bacteria	**Fungi**	**Yeast**	**Myco-bacteria**	**TB**	**Viruses**	**Spores**	**Legionella**
Hygienic handwash	EN 1499 EN 13727					EN 14476		
Hygienic handrub	EN 1500 EN 13727					EN 14476		
Surgical (wash and rub)	EN 12791					EN 14476		
Surfaces	EN 13727	Test may be developed	Test may be developed	EN 14348	EN 14348	EN 14476	Test may be developed	
Instruments	EN 13727 EN 14561	EN 13624 EN 14562	EN 13624 EN 14562	EN 14348 EN 14563	EN 14348 EN 14563	EN 14476	Work item approved	
Water								Work item approved

EUROPEAN SPORICIDAL TEST FOR MEDICAL PRODUCTS – CURRENT SITUATION

- There is no phase 2/step 1 test for sporicidal products in the medical area
- *C difficile* spores difficult to produce
  - Need high titre to demonstrate log kill
  - May have vegetative organisms and not spores
- EN 13704
  - Food, domestic and industrial areas
  - Requires 3 log reduction
  - 60 mins
  - Clean conditions only

WIPES

- No standard test available specifically for wipes
- The fibres of wipes may adsorb surface active disinfectants – effectively removing disinfectant from solution.
- Therefore, if a disinfectant used in a wipe is to be tested, it should be the fluid squeezed from wipes, not the fluid added that is tested.

TYPES OF DISINFECTANTS

- Aldehydes e.g. glutaraldehyde, ortho-phthalaldehyde
- Oxidising agents e.g. chlorine releasing agents, peracetic acid, chlorine dioxide, hydrogen peroxide
- Alcohol
- Quaternary ammonium compounds
- Chlorhexidine
- Povidone iodine
- Triclosan
- etc.

Table 3: Microbicidal activity of chemical disinfectants

Disinfectant	Spores	Mycobacteria	Bacteria	Viruses
Alcohol	✗	✓✓	✓✓✓	✓✓
Glutaraldehyde	✓*	✓✓✓**	✓✓✓	✓✓✓
ortho-phthalaldehyde	✓*	✓✓✓	✓✓✓	✓✓✓
Other aldehydes***	✓*	✓✓✓	✓✓✓	✓✓✓
Chlorine dioxide	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Peracetic acid***	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Other peroxygen compounds***	✗	✓	✓✓✓	✓✓
QACs***	✗	✓✓	✓✓	✓✓
Superoxidized saline	✓✓✓	✓✓✓	✓✓✓	✓✓✓

Key: ✗ None ✓ Poor ✓✓ Moderate ✓✓✓ Good

* The sporicidal activity of aldehydes is increased with extended contact times e.g. greater than 3 hours.

** There are some concerns relating to the activity of glutaraldehyde against atypical mycobacteria.

*** The activity of other aldehydes e.g. succine dialdehyde, peroxygen compounds and QACs (Quaternary Ammonium Compounds) varies with concentration.

GOOD CLEANING IS ESSENTIAL

It removes :-

- Potentially infectious micro-organisms
- The organic material on which micro-organisms thrive
- Soil which protects micro-organisms during sterilization and disinfection
- Soil which may inactivate chemical disinfectants

Disinfectants do not clean!

METHOD OF APPLICATION

- Concentrate
  - Diluted for use by the user
- Ready to use
- Pre-impregnated wipes
- Automated
  - e.g. endoscope washer disinfector
- Manual
  - e.g immersion

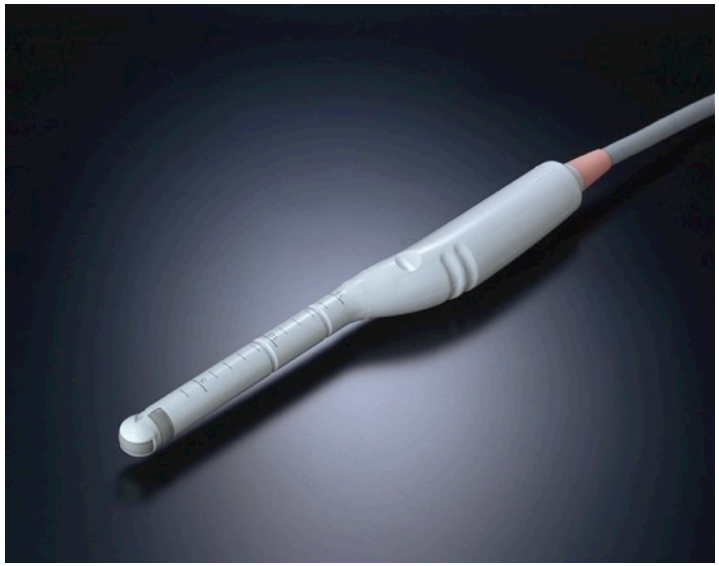
- Dependant upon intended usage - environmental surface, instrument/device or skin

HOW TO USE PRODUCTS

- Preparation of correct dilution
  - System for measuring product and water to ensure correct concentration
- Ensure pre-impregnated wipes do not dry out
- Single use cloths – no double dipping!
- Automated vs manual reprocessing of flexible endoscopes
- Beware of overuse of reusable disinfectants particularly for endoscope disinfection
- Ensure staff are trained in how to prepare/use disinfectants and health and safety

WIPING

- Compatibility
- Efficacy
- Contact time
- Standardisation of wiping
- Coverage of all surfaces
- Number of wipes used
- One wipe, one surface, one direction!



CATEGORIES OF INFECTION RISK ASSOCIATED WITH MEDICAL DEVICES

HIGH RISK

Items in close contact with break in the skin or mucous membranes or introduced into a sterile body cavity

STERILIZATION REQUIRED

INTERMEDIATE RISK

Items in contact with intact mucous membranes DISINFECTION (OR STERILIZATION) REQUIRED

DECONTAMINATION OPTIONS

STERILIZATION

Heat
- Steam
- Dry Heat

Chemical
- Ethylene Oxide
- Sporicidal disinfectants
- Irradiation
- Gas Plasma

Incineration

Filtration

DISINFECTION

Heat
- Thermal washer disinfector
- Boiler

Chemical
- Chemical disinfectants

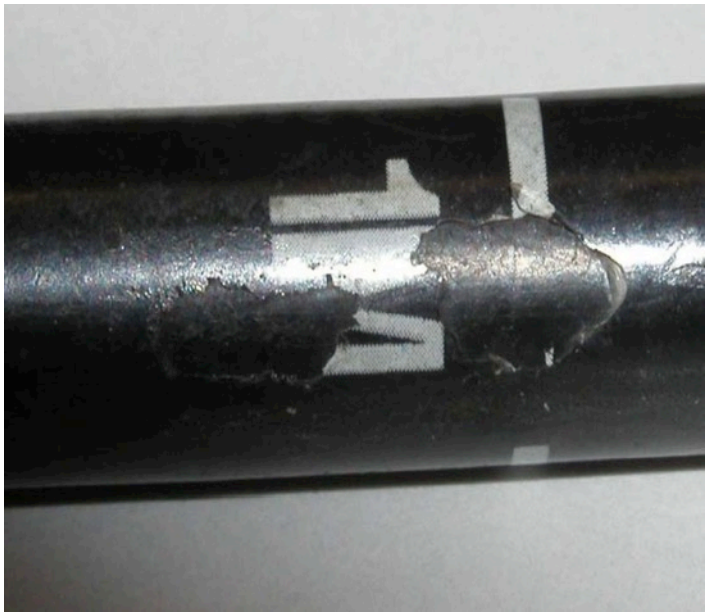
SELECTION OF AN INSTRUMENT DISINFECTANT

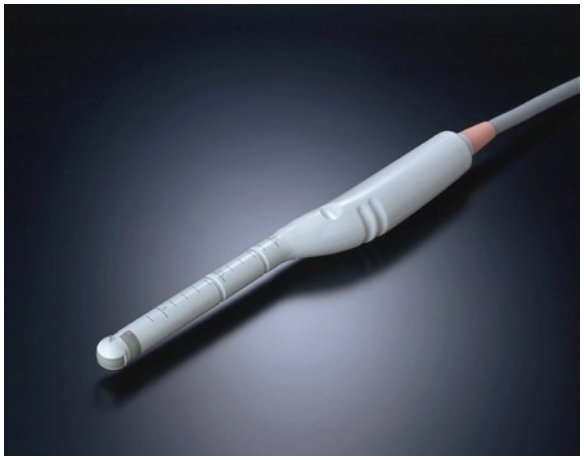
Ensure the disinfectant

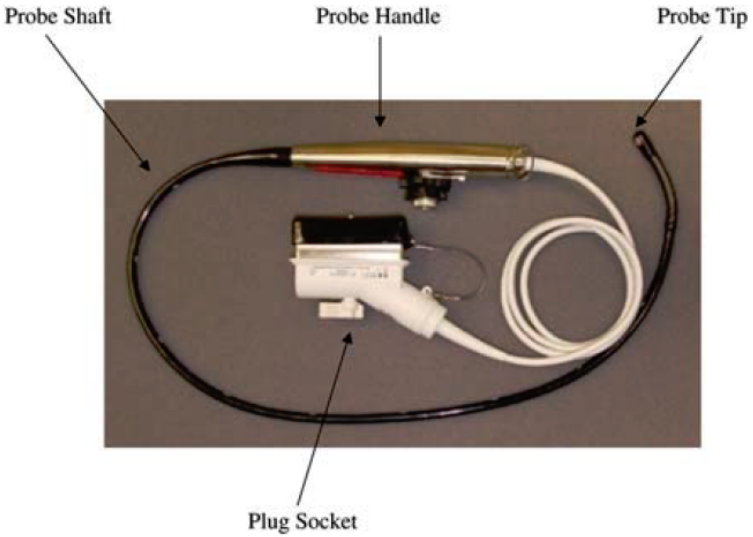
- has broad spectrum of microbicidal activity
- is compatible with instruments and processing equipment
- is used at an effective concentration
- is in contact with all surfaces
- single use is the preferred option. If reusable, a test strip/kit should be used.

DISINFECTANT DAMAGE

- Blistering of outer coating






Probe Shaft
Probe Handle
Probe Tip
Plug Socket

ISSUES WITH PROBE DECONTAMINATION

- Numerous patients seen in one session
- Often insufficient probes for one per patient
- Short periods only available for decontamination
- Use of a sheath does not negate the need for decontamination
- Probes often heat sensitive
- Disinfectants may be damaging or ineffective
- Reluctance to unplug the probe
- Shared surfaces; clean vs dirty

ENVIRONMENT

- Remote from patient
  - Floors, walls, window sills, skirting boards etc
- Near patient – high touch surfaces
  - Bed – mattress and frame
  - Locker
  - Bed table
  - Drip stand
  - etc

ENVIRONMENTAL DISINFECTION

- When an area is occupied by infected and non-infected patients, routine disinfection of the general environmental may have a role in infection control.
- Disinfection of communal equipment after each use is of far greater value e.g. commodes.

HAND WASH or HAND RUB

- If hands visibly dirty – hand wash.
- If hands visibly clean – hand rub or hand wash.
- Compliance with EN 1500 (hand rub) or EN 1499 (hand wash)

- **Hand wash**
  - May contain antimicrobial agents.
  - Main action is physical removal of microorganisms.
  - Adequate drying is essential.
  - Paper towels or dryers?
- **Hand rub**
  - Contain antimicrobial agents.
  - Work by killing microorganisms.
  - Should be rubbed in until dry.

SELECTION AND USE OF DISINFECTANTS

- Always ask for test reports to substantiate claims
- Check that the report reflects the instructions for use e.g. kills spores in 60 minutes but recommends 60 second contact time
- Selection of products should have a multi-disciplinary approach e.g. IPCT, hotel services etc
- Don't bring in products from home
- Ensure products are accurately prepared and used in accordance with the manufacturers instructions.


essential Waitrose
washing up liquid original
Cif
Cream

THANK YOU FOR LISTENING