

## Disinfectants and Antiseptics

### disinfectant

- **chemical which kills**
  - bacteria
  - fungi
  - viruses
  - protozoa
  - and often domestic animals

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### antiseptic

- **a disinfectant which is safe to apply to animals**
  - a more innocuous chemical
  - a more dilute solution

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### What would you use?



- **a kennel where a pup has recently died of parvovirus diarrhoea**

## **groups of chemicals**

- alcohols
- aldehydes
- halogens
- phenols & cresols
- quaternary ammonium compounds
- chlorhexidine

## **antibiotic / antiseptic**

- triclosan
- polymyxins
- clioquinol

## **mechanisms**

- "protein coagulation"
- "membrane disruption"
- many specific mechanisms

## **alcohols**

- ethanol
- isopropanol
- kill bacteria and some viruses
- inflammable
- sting on application to tissues
- used as skin antiseptic, surgical instruments, suture material

## aldehydes

- formaldehyde
- glutaraldehyde
- kill bacteria, fungi and most viruses
- care with fumes
  - irritant
  - carcinogenic?
- used for surgical instruments, kennels
- not antiseptic except sheep's feet

## halogens

- chlorine
- iodine

## chlorine

- usually hypochlorite solution
- kills most things except protozoa
- irritant fumes, especially at low pH
- bleaches clothes
- inactivated by organic material & cationic detergents
- used on clean surfaces, water treatment

## iodine

- iodine solution ( $\pm$  KI), tincture of iodine, povidone iodine
- kills most things including protozoa
- can cause excessive uptake of iodine
- dries skin
- contact dermatitis in some dogs
- corrodes metals
- used for surgical scrubs, general antiseptic, water treatment

## phenols & cresols

- many chemicals
- toxic to cats
- neurotoxic and teratogenic
- strong smell
- used as floor and toilet cleaners
- keep away from animals

## quaternary ammonium compounds

- cetrimide, benzalkonium, many detergents
- kill bacteria except *Pseudomonas*, some fungi, some viruses
- detergent
- inactivated by organic material
- often cause skin sensitisation
- used as mild antiseptics, floor cleaners, detergents

## chlorhexidine

- kills bacteria, some fungi, some viruses
- chemically incompatible with many other antiseptics
- toxic in eyes and middle ear
- solutions usually contain cetrimide
- inactivated by anionic soaps
- used as surgical scrub, instruments

## hydrogen peroxide

- oxidising agent
- effective bleach
- toxic to fibroblasts?
- used for cleaning wounds and endoscopes

## others

- **oxidising agents**
  - Virkon S
  - ethylene oxide
  - potassium permanganate
- **physical agents**
  - steam
  - UV light
  - $\gamma$  radiation

## resistance

- **innate resistance**
  - spores
- **acquired resistance**
  - *Staph aureus*

## surgical scrubs

- **clip hair and remove clippings**
- **wash**
- **wash with antiseptic**
- **spray with alcoholic solution**

## cleaning hard surfaces

- **remove organic material**
- **remove soap residues**
- **cationic detergents?**

## cleaning equipment

- wash
- soak in glutaraldehyde / iodine / hydrogen peroxide
- rinse with sterile water

## OSH

- nasty chemicals must be stored properly

## What would you use?



- a kennel where a pup has recently died of parvovirus diarrhoea



## what would you use?

- as a teat dip in a herd with a chronic *Staph aureus* mastitis problem

## comparison

activity	pov. iodine	chlorhexi dine	cetrimide	alcohol
G+	+++	+++	+++	+++
G-	++	++	+	++
acid fast	+++	+	0	0
spores	++	0	0	0
fungi	+++	+	0	+
viruses	+++	+	0	++
protozoa	+++	0	0	0