

## **Disinfectants and Antiseptics**

### **disinfectant**

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

### **antiseptic**

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

### **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**
- **flammable**
- **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**
- **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

### **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**

- **Virkon S**
- **ethylene oxide**
- **potassium permanganate**
- **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 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