

# 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
- 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
- used for surgical instruments, kennels
- not antiseptic except sheep's feet





# halogens

- chlorine
- iodine



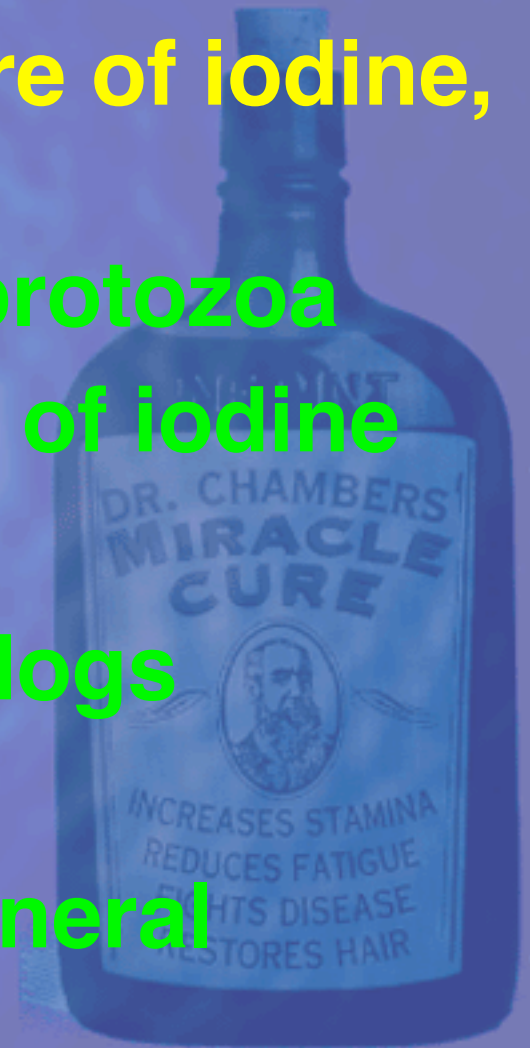
# chlorine

- 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



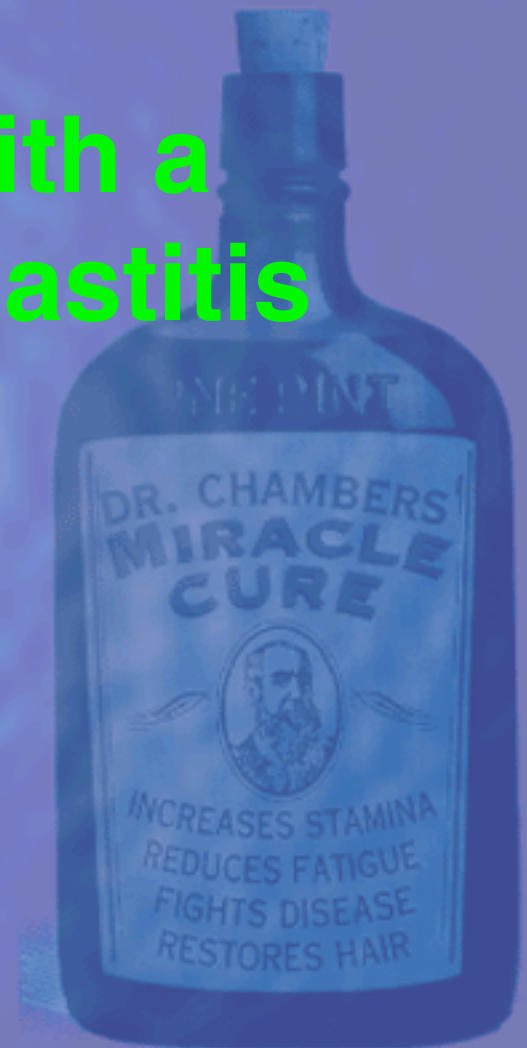






# what would you use?

- 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

