

# Welcome to

Veterinary Pharmacology,  
Toxicology and Therapeutics

227.305

# Pharmacology - Why bother?

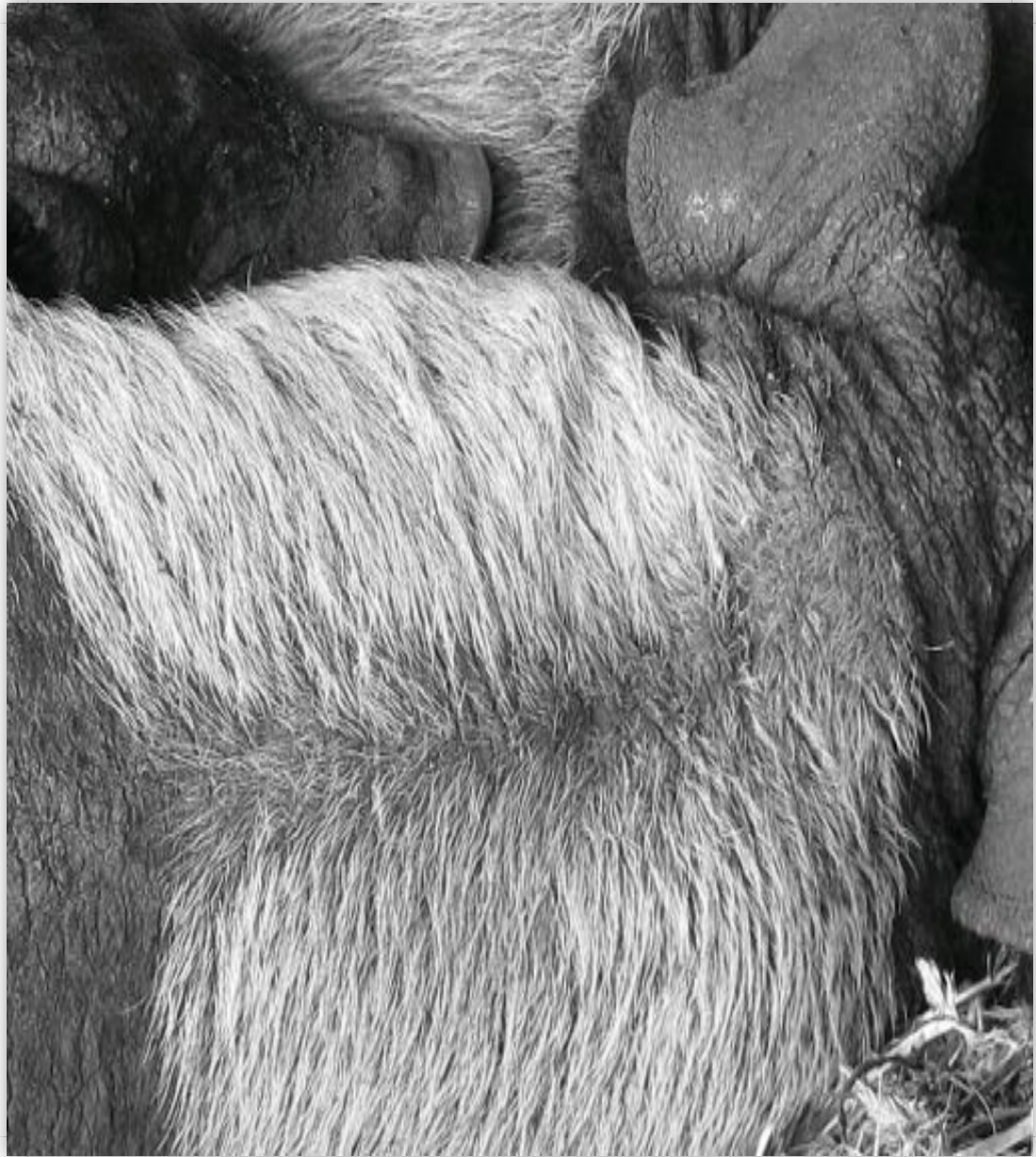
# Treatment options

There are usually several things you can do, like:

- do nothing
- give drugs
- surgery
- change diet
- euthanasia
- all but the first involve drugs!

What do you  
need to know?







# What do you need to know?

- history
- clinical exam findings
- **differential list**
- lab tests?
- diagnosis



# What do you need to know?

to treat the piglets?

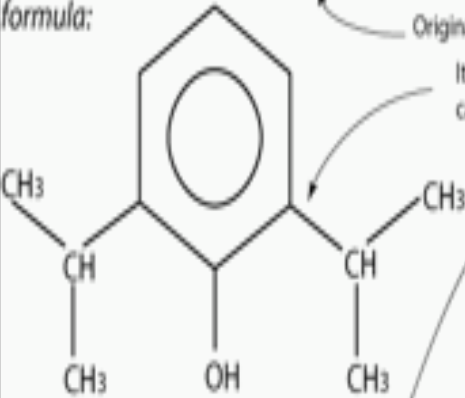
- treatment objectives?
- drugs likely to be active?
- side effects & interactions?
- monitoring required?
- pharmacokinetics?
- dose?
- cost?
- do the benefits outweigh the risks?

# Drug names

Don't get bogged down!

drug company number: **ICI 35 368**

formula:



Originally developed by ICI (now AstraZeneca).

It is sometimes useful to know a drug's structure: cats can have problems metabolising phenols.

There are two different international classifications for chemical names, IUPAC & CA

Chemical Abstracts Service Registry No. A unique no. In the past drugs were approved by several different bodies, so older drugs may have different British Approved Names or United States Adopted Names. They are all supposed to be approved by the WHO now and have International Non-proprietary Names although these can be provisional (pINN) or recommended (rINN).

chemical name: **2,6 di-isopropylphenol**  
**2,6 bis(1 methylethyl)phenol**

CAS number: **2078-54-8**

approved name: **propofol**

trade names:

veterinary: **"Rapinovel"** (Schering-Plough)  
**"Aquafof"** (Parnell)

human: **"Diprivan"** (AstraZeneca)  
**"Propofol Inj"** (Baxter)  
**"Propofol Inj"** (Abbott)  
**"Recofol"** (Pacific)

Propofol (the active ingredient) is formulated in a suitable vehicle for injection into animals. The original vehicle was a soya bean lipid emulsion. It was then sealed into vials and has different labels stuck on it for human or veterinary use (Diprivan or Rapinovel). Since the patent ran out, other companies are now making and selling propofol in different formulations, eg Aquafof is an aqueous solution.

# Active drugs?

- antiseptics
  - chlorhexidine
  - iodine

# Active drugs?

- antibiotics
  - penicillins
    - narrow spectrum
    - broad spectrum
  - cephalosporins
  - tetracyclines
  - etc, etc

# info you need to know

- antibiotics
  - penicillins
    - narrow spectrum
      - benzylpenicillin
        - Na benzylpenicillin
        - K benzylpenicillin
        - procaine penicillin
        - benzathine penicillin
      - phenoxymethylpenicillin
    - broad spectrum
  - etc

# info you need to know

## *pharmacokinetics*

- penicillins
  - narrow spectrum
    - benzylpenicillin
      - Na benzylpenicillin
      - K benzylpenicillin
      - procaine penicillin
      - benzathine penicillin
    - phenoxymethylpenicillin
  - broad spectrum
- etc

# Sources of info

1. scientific literature
  2. textbooks
  3. colleagues
  4. www
  5. drug companies
- plus this course!**

resources

**Stream**

**Calve**

**Massey library**



but...

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## Antimicrobial Susceptibility of *Staphylococcus hyicus* Isolated from Exudative Epidermitis in Pigs

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Exudative epidermitis or greasy pig syndrome is caused by the coagulase-variable staphylococcal species *Staphylococcus hyicus*. Treatment of this disease is problematic because of the limited number of antimicrobial agents available for this purpose. Thirteen antimicrobial agents were evaluated for their activities against 100 *S. hyicus* strains isolated from pigs with exudative epidermitis. Novobiocin was the most active compound tested, with an MIC for 90% of the strains tested (MIC<sub>90</sub>) of  $\leq 0.06$   $\mu\text{g/ml}$ . Enrofloxacin, ampicillin, and cefixur were the next most active compounds, with MIC<sub>90</sub>s of 0.25, 0.5, and 1.0  $\mu\text{g/ml}$ , respectively. However, 41.4% of the 99 strains tested were positive for  $\beta$ -lactamase production. The MIC<sub>90</sub>s of erythromycin, tetracycline, and streptomycin were  $>32.0$   $\mu\text{g/ml}$ . Initial testing with sulfadiazine-trimethoprim yielded an MIC<sub>90</sub> of  $>64.0$   $\mu\text{g/ml}$ , but subsequent testing with thymidine phosphorylase-supplemented medium yielded an MIC<sub>90</sub> of 0.06  $\mu\text{g/ml}$ . Both lincomycin and spectinomycin were relatively inactive against the *S. hyicus* strains tested, with MIC<sub>90</sub>s of  $>64.0$  and  $>128.0$   $\mu\text{g/ml}$ , respectively. However, the combination of the two compounds at ratios of 1:2 (lincomycin to spectinomycin) and 1:8 were more active, with MIC<sub>90</sub>s of 16.0 and 4.0  $\mu\text{g/ml}$ , respectively. These results indicate that novobiocin and sulfadiazine-trimethoprim were the most active compounds tested against the *S. hyicus* strains isolated from pigs with exudative epidermitis. Furthermore, the combination of lincomycin and spectinomycin was more active than the individual compounds against the strains tested.

Reading scientific papers to  
extract clinically  
useful info

# Types of papers

- veterinary clinical trials
- human clinical trials
- basic science papers

# Drug develop- ment

- synthesise compounds
- screen for activity on target
- screen for activity on other targets
- test in animal models
- pharmacokinetics
- animal toxicity testing
- phase 1 trials (healthy target species)
- phase 2 trials (sick target species)
- phase 3 trials (large nos. sick target species)
- (phase 4 trials – post marketing surveillance)

"It has been clearly shown that drugs acting at the ORL1 receptor are good analgesics in isolated spinal cord preparations."

Faber et al., 1996, Br J Pharmac, 119, 189 – 190

# reading papers

- Are the results valid?
  - randomisation?
  - all animals accounted for?
  - controls? dose? numbers?
- What are the results?
  - size of effect?
  - precision? (stats)
- How do the results compare to other studies?

# reading papers

- Relevance to practice in NZ?
- Will the results help me in caring for my patients?



**Phar-  
macolo-  
gy is fun!**