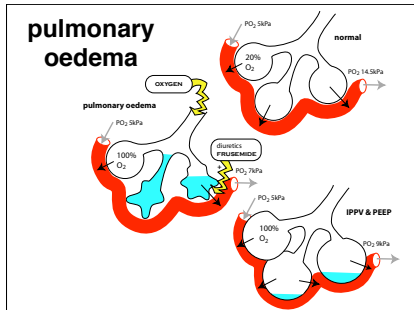


## Respiratory Drugs

### pulmonary oedema

- lungs full of fluid
  - hypoxia
    - cyanosis
    - unconsciousness
    - death



### pulmonary oedema

- frusemide
- oxygen
  - IPPV? ± PEEP?
- other drugs
  - colloids
  - morphine
  - inotropes?
  - steroids?

## **oxygen**

- **indications**
  - hypoxia
- **care**
  - avoid excitement
  - avoid > 4 hours 100%
    - give air breaks
    - long term treatment use 50%
  - supports combustion!!

## **common problems**

- upper respiratory tract infections
- tracheitis / bronchitis
- pneumonia
- airway hyperreactivity

## **secondary problems**

- **URT infections**
  - inflamed mucous membranes
  - excessive mucus production
  - thick mucus
  - coughing

## **secondary problems**

- **bronchitis**
  - inflamed mucous membranes
  - excessive mucus production
  - thick mucus
  - coughing
  - cilia not working
  - airway hyperreactivity

## **secondary problems**

- **pneumonia**
  - hypoxia

## **treatment**

- **treat primary problem**
  - but many infections are caused by viruses
- **symptomatic treatment of secondary problem**

## **expectorants**

- **increase amount of mucus**
- **decrease viscosity**
- **increase cilia action**
- **mucus must be coughed up**

## **expectorants**

- **potassium iodide**
- **guaiphenesin**
- **volatile oils**
  - menthol
  - eucalyptol

### **mucolytics**

- **acetylcysteine**
- **bromhexine**

### **side effects**

- **guaiphenesin** – mild effects ↓ BP ↑ HR
- **acetylcysteine** – bronchospasms
  - nausea, vomiting

### **antitussives**

- **only used for unproductive coughing**
- **to allow animal to rest**

### **antitussives**

- **local**
  - local anaesthetics
- **central**
  - opioids
    - codeine
    - butorphanol

## **antitussives**

- **contraindications**
  - productive coughing
  - chest injury
- **care**
  - vomiting

## **bronchodilators**

- bronchoconstriction is a major problem in man (asthma)
- some importance in cats and horses
- dogs??
- not important in ruminants
- guinea pigs are the most susceptible species

## **bronchodilators**

- **sympathomimetics**
- **methylxanthines**
- **antimuscarinics**
- **glucocorticoids**

## **sympathomimetics**

- **$\alpha$ 1 agonists**
  - pseudoephedrine
- **$\beta$ 2 agonists**
  - clenbuterol
  - terbutaline
  - adrenaline

## pseudoephedrine

- vasoconstrictor
- precursor for methamphetamine

## $\beta$ 2 agonists

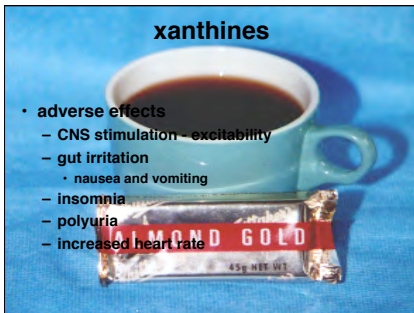
- clenbuterol
  - adverse effects
    - tremors
    - sweating
    - restlessness
    - increased HR
    - abortion

## xanthines

- theophylline
  - aminophylline
  - etamiphylline
- propentophylline
- (theobromine)
- (caffeine)

## xanthines

- adverse effects
  - CNS stimulation – excitability
  - gut irritation
    - nausea and vomiting
  - insomnia
  - polyuria
  - increased heart rate



## **antimuscarinics**

- **atropine**
  - historically used in horses
  - reduces secretions
  - increases viscosity of mucus
  - may be useful as an adjunct to other drugs
  - adverse effects
    - dry mouth, dysphagia, constipation, vomiting, thirst, sedation, ↑ heart rate, blurred vision, etc.

## **antimuscarinics**

- **propantheline**
  - abused in horses
  - “blue magic”

## **glucocorticoids**

- **betamethasone**
- **dexamethasone**
  - at normal doses, reduce bronchoconstrictor inflammatory mediators

## **antihistamines**

- mainly used for allergic reactions
- often included in human cough remedies - other effects?
- sometimes used in acute respiratory infections

## histamine

- released from mast cells
- lungs, skin, gut, CNS
- species differences in response
  - mice very resistant
  - guinea pigs very susceptible
  - dogs act more like guinea pigs

## histamine receptors

- H1 - skin, smooth muscle
- H2 - gastric parietal cells
- H3 - presynaptic on neurones (inhibition)

## H1 antagonists

- promethazine
- chlorpheniramine
- mepyramine
- diphenhydramine

## cromoglycate

- blocks release of inflammatory mediators
- sometimes used in horses with chronic obstructive pulmonary disease
- given as an aerosol
- preventative only



### **respiratory stimulants**

- act on medulla
- doxapram
- obsolete
  - nikethamide
  - bemegride

### **respiratory system**

- antibiotics are given for infections - stop secondary bacterial infections after viruses
- expectorants are used to loosen and remove mucus
- codeine and butorphanol stop unproductive coughing
- animals with fluid in the lungs require oxygen and sometimes diuretics