

## 1 Anti-inflammatory Drugs

- NSAIDs & Anti-arthritis Drugs

## 2 anti-inflammatory drugs

- steroids
- NSAIDs
- anti-arthritic drugs
- odds & ends

## 3 anti-inflammatory drugs

- steroids
- NSAIDs
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- odds & ends

## 4 NSAID effects

- analgesic
- anti-inflammatory
- anti-pyretic
- anti-thrombotic
- anti-endotoxaemic?

## 5 mechanisms

- block PG production
- scavenge free radicals
- PG receptor antagonism
- interfere with neuropeptide signalling

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## 9 cyclo-oxygenase

- COX 1 constitutive
  - physiological
- COX 2 inducible

- mainly in response to inflammation
- COX 3 neuronal???

#### 10 analgesic NSAIDs

- carprofen
- ketoprofen
- flunixin

#### 11 anti-inflammatory NSAIDs

- horses
  - phenylbutazone
  - flunixin
  - ketoprofen
  - fenamates
  - (dipyrone)

#### 12 colic

- ketoprofen
- flunixin

#### 13 anti-inflammatory NSAIDs

- cattle
  - flunixin
  - ketoprofen
  - tolfenamate

#### 14 anti-arthritis NSAIDs

- dogs
  - meloxicam
  - carprofen
  - flunixin
  - ketoprofen
  - fenamates etc

#### 15 anti-thrombotic

- aspirin

16  COX 2 inhibitors

- celecoxib
- rofecoxib
- etoricoxib
- valdecoxib
- parecoxib
- firocoxib
- (deracoxib)

17  pharmacokinetics

- extreme variation between species
- eg, aspirin half life
  - cat 22 hours
  - cattle 25 minutes

18  pharmacokinetics

- use only in species for which you have information
- remember protein binding

19  side effects

- gastric ulceration
- kidney failure
- increased bleeding time
- liver damage
- asthma
- agranulocytosis
- dermal reactions

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22  side effects

- gastric ulceration

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23 

24  side effects

- increased bleeding time
  - aspirin
- liver damage
  - carprofen
- asthma
- agranulocytosis
  - phenylbutazone
- dermal reactions
- heart failure (people)
  - coxibs

25  beware

- paracetamol (acetaminophen USAN) in cats

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27  anti-arthritis drugs

- glycosaminoglycans
  - chondroitin
  - hyaluronic acid
  - pentosan
  - (heparin)
- glucosamine
- green mussel extract
- antioxidants

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29  mechanisms???


- mechanical effect
- stops proteoglycan breakdown
- increases proteoglycan synthesis
- block PG production
- block several cytokines' production
  - fibroblast growth factor
- anticoagulant

30  indications

- horses & dogs
  - mild osteoarthritis
  - degenerative joint disease?
  - limit growth of tumours?
    - fibroblast growth factor?

31  administration

- intra-articular
- im
- po?

32  contra-indications

- infection
- clotting defects / bleeding
- liver or kidney disease

33  side effects

- local reaction
- infection
- clotting problems
- hypersensitivity
- impoverish owner

### 34 antioxidants

- mop up free radicals
- prevent membrane damage
- endogenous systems overloaded
  - superoxide dismutase
  - catalase
  - glutathione peroxidase

### 35 antioxidants

- vitamin E
- glutathione
- herbal medicines??

### 36 fatty acids

- n-3 fatty acids produce PGE3
- mild anti-inflammatory effect
- no known side effects
- “natural” (in fish anyway)

### 37 odds & ends

- copper
- DMSO
- gold
- penicillamine
- chloroquine
- quinine
- sulphasalazine
- antihistamines

### 38 dimethylsulphoxide

- solvent for both hydrophobic and hydrophilic drugs
- anti-inflammatory & antimicrobial
- carries other drugs across skin

### 39 new drugs

- interleukin antagonists
- tumour necrosis factor
  - antagonists
  - antibodies – infliximab
  - PDE4 inhibitors – thalidomide?
- transcription factor regulators
  - mitogen activated protein kinase inhibitors

### 40 arthritis

- treat cause if possible
- relieve discomfort
  - rest
  - diet
  - drugs
  - (joint replacement)
  - arthrodesis / excision arthroplasty
  - euthanasia

### 41 drugs in arthritis

- NSAIDs
- PSGAGs
- corticosteroids

### 42

### 43 problems?

- tissue damage
- inflammation
- pain
- loss of function

### 44 treatment

- gentle exercise

- NSAIDs

## 45 anti-inflammatory drugs

- steroids are the most potent anti-inflammatory drugs
- NSAIDs are useful for both acute and chronic inflammation, but gastric ulceration limits duration of use
- mucopolysaccharides are sometimes used for arthritis in horses and dogs
- many drugs have some anti-inflammatory effect