

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
- anti-arthritic drugs
- 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
 - tolafenamate

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

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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