

CHAPTER 43

Antiinflammatory, Antirheumatoid, and Related Agents

NDEG 26A – Pharmacology I
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NSAIDs

- Large and chemically diverse group of drugs with the following properties:
 - Analgesic
 - Antiinflammatory
 - Antipyretic
 - Antirheumatic

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NSAIDs: Mechanism of Action

- Activation of the arachidonic acid pathway causes:
 - Pain
 - Headache
 - Fever
 - Inflammation

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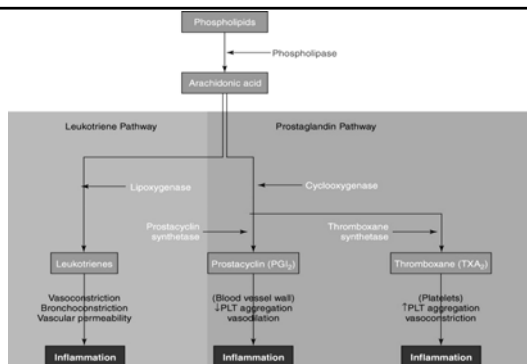


Figure 43-1 Arachidonic acid pathway

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NSAIDs: Mechanism of Action (cont'd)

- Analgesia—treatment of headaches, mild to moderate pain, and inflammation
 - Block the chemical activity of either or both COX enzymes (prostaglandin [PG] pathway) and lipoxygenase (LT pathway)
 - Result: limits the undesirable inflammatory effect of PGs

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NSAIDs: Mechanism of Action (cont'd)

- Antipyretic: reduce fever
 - Inhibit prostaglandin E₂ within the area of the brain that controls temperature

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NSAIDs: Salicylates

- Salicylates also have antiplatelet activity
 - Inhibit platelet aggregation

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Chemical Categories of NSAIDs

Seven structurally related groups

- Acetic acids
- Carboxylic acids (salicylates)
 - Acetylated and nonacetylated
- Propionic acids
- COX-2 inhibitors
- Fenamic acids
- Naphthalkanones (nonacidic)
- Oxicams

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NSAIDs: Acetic Acid

- diclofenac sodium (Voltaren)
- diclofenac potassium (Cataflam)
- indomethacin (Indocin)
- sulindac (Clinoril)
- tolmetin (Tolectin)

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NSAIDs: Carboxylic Acids

Acetylated

- aspirin (ASA)
- choline magnesium salicylate (Trilisate)
- diflunisal (Dolobid)

Nonacetylated

- ketorolac (Toradol)
- salicylamide
- salsalate (Disalcid)
- sodium salicylate

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NSAIDs: Propionic Acids

- fenoprofen (Nalfon)
- flurbiprofen (Ansaid)
- ibuprofen (Motrin, Advil, others)
- ketoprofen (Orudis)
- naproxen (Naprosyn)
- oxaprozin (Daypro)

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NSAIDs: Other Agents

COX-2 inhibitors

- celecoxib (Celebrex)
- rofecoxib (Vioxx)
- valdecoxib (Bextra)

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NSAIDs: Other Agents (cont'd)

Oxicams

- meloxicam (Mobic)
- piroxicam (Feldene)

Fenamic acids

- meclufenamate
- mefenamic acid (Ponstel)

Nonacidic compounds

- nabumetone (Relafen)

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NSAIDs: Indications

- Analgesia (mild to moderate)
- Antigout effects
- Antiinflammatory effects
- Antipyretic effects
- Relief of vascular headaches
- Platelet inhibition (ASA)

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NSAIDs: Indications (cont'd)

- Relief of mild to moderate pain
- Acute gout
- Various bone, joint, and muscle pain
- Osteoarthritis
- Rheumatoid arthritis

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NSAIDs: Indications (cont'd)

- Juvenile rheumatoid arthritis
- Dysmenorrhea
- Fever
- Many other conditions

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BOX 43-2 NSAIDs: FDA-Approved Indications

- Acute gout
- Acute gouty arthritis
- Acute painful shoulder
- Ankylosing spondylitis
- Bursitis
- Fever
- Juvenile rheumatoid arthritis
- Mild-to-moderate pain
- Osteoarthritis
- Primary dysmenorrhea
- Rheumatoid arthritis
- Tendinitis
- Various ophthalmic uses

NSAID, Nonsteroidal antiinflammatory drug; FDA, U.S. Food and Drug Administration.

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Box 43-2 NSAIDs: FDA-Approved Indications

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NSAIDs: Salicylates

salicylates (aspirin)

- More potent effect on platelet aggregation and thermal regulatory center in the brain
 - Analgesic
 - Antipyretic
 - Antiinflammatory
- Antithrombotic effect: used in the treatment of MI and other thromboembolic disorders

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NSAIDs: Antigout Agents

- Gout: condition that results from inappropriate uric acid metabolism
 - Underexcretion of uric acid
 - Overproduction of uric acid
- Uric acid crystals are deposited in tissues and joints, resulting in pain

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NSAIDs: Antigout Agents (cont'd)

allopurinol (Zyloprim)

- Used to reduce production of uric acid

colchicine

- Reduces inflammatory response to the deposits of urate crystals

probenecid (Benemid), sulfipyrazone (Anturane)

- Increase excretion of uric acid in the urine

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NSAIDs: Side Effects

Gastrointestinal

- Dyspepsia, heartburn, epigastric distress, nausea
 - GI bleeding*
 - Mucosal lesions* (erosions or ulcerations)

*misoprostol (Cytotec) can be used to reduce these dangerous effects

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NSAIDs: Side Effects (cont'd)

Renal

- Reductions in creatinine clearance
- Acute tubular necrosis with renal failure

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NSAIDs: Side Effects (cont'd)

Cardiovascular

- Noncardiogenic pulmonary edema

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NSAIDs: Salicylate Toxicity

- Adults: tinnitus and hearing loss
- Children: hyperventilation and CNS effects
- Effects arise when serum levels exceed 300 mcg/mL
- Metabolic acidosis and respiratory alkalosis may be present

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NSAIDs: Nursing Implications

- Before beginning therapy, assess for conditions that may be contraindications to therapy, especially:
 - GI lesions or peptic ulcer disease
 - Bleeding disorders
- Assess also for conditions that require cautious use
- Perform lab studies as indicated (cardiac, renal, liver studies, CBC, platelet count)

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Nursing Implications

- Perform a medication history to assess for potential drug interactions.
- Several serious drug interactions exist
 - Alcohol
 - Heparin
 - Phenytoin
 - Oral anticoagulants
 - Steroids
 - Sulfonamides

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Nursing Implications

- Salicylates are *NOT* to be given to children under age 12 because of the risk of Reye's syndrome
- Because these agents generally cause GI distress, they are often better tolerated if taken with food, milk, or an antacid to avoid irritation
- Explain to patients that therapeutic effects may not be seen for 3 to 4 weeks

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Nursing Implications

- Educate patients about the various side effects of NSAIDs, and to notify their physician if these effects become severe or if bleeding or GI pain occurs
- Patients should watch closely for the occurrence of any unusual bleeding, such as in the stool
- Enteric-coated tablets should not be crushed or chewed

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Nursing Implications

- Monitor for therapeutic effects, which vary according to the condition being treated
 - Decrease in swelling, pain, stiffness, and tenderness of a joint or muscle area

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