Pharmacy Pearls

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Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) Comparison

Introduction

Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

MOA: inhibit cyclooxygenase (COX) → impairing transformation of arachidonic acid to prostaglandins, prostacyclin, and thromboxanes leading to anti-inflammatory, anti-pyretic, and analgesic effects

- COX-1 converts arachidonic acid to *homeostatic prostaglandins* → renal homeostasis, gastric mucosal protection, platelet function
- COX-2 converts arachidonic acid to *inflammatory prostaglandins* → pain, inflammation, fever

Risks of NSAID Use: GI bleeding and ulceration, MI/stroke, increased blood pressure, decrease renal clearance

Comparing NSAIDs + Risks

**Listed in order of increased COX-2 selectivity*

Non-Selective NSAIDs – inhibit COX-1 and COX-2			
Medication	**Common Dose (PO)**	**GI Risk**	**CV Risk**
Indomethacin (Indocin®)	IR: 25-50 mg every 8-12 hours CR: 75 mg once or twice daily	Moderate-High	Moderate
Naproxen (Aleve®)	Naproxen base: 250-500 mg every 12 hours Naproxen sodium: 275-550 mg every 12 hours	Moderate	Low-Moderate
Ibuprofen (Advil®, Motrin®)	400 mg every 6-8 hours	Low	Moderate-High
Selective NSAIDs – increased COX-2 selectivity			
Medication	**Common Dose (PO)**	**GI Risk**	**CV Risk**
Celecoxib (Celebrex®)	200 mg daily or 100 mg every 12 hours	Low	Moderate-High
Diclofenac (Voltaren®, Cambia®)	50 mg every 8 hours	Moderate	High
Meloxicam (Mobic®)	Tablet: 7.5-15 mg once daily Capsule: 5-10 mg daily	Low	Moderate
Etodolac (Lodine®)	IR: 200-400 mg every 6-8 hours ER: 400-1,000 mg once daily	Low	Moderate

Mitigating NSAID-Related GI Risk

1. Utilize lowest dose + shortest duration of NSAID treatment – *average duration of treatment associated with GI effects is 84 days for non-selective NSAIDs*
2. Utilize COX-2 selective NSAID with lower GI risk
3. **Primary Prevention** – patients at high risk for GI injury are indicated for PPI or misoprostol to reduce their risk

   Risk Factors for GI Injury from NSAIDs:

- History of ulcer disease or complication → test for *H.pylori* prior to therapy
- On dual antiplatelet therapy
- On anticoagulant therapy
- 2-3 of the following: 60+ years old, glucocorticoid use, dyspepsia or GERD symptoms

  FDA-Approved: lansoprazole 15-30 mg daily, esomeprazole 20-40 mg daily, misoprostol 200 mcg four times daily

4. **Secondary Prevention** – patients with history of gastroduodenal toxicity from NSAIDs or low-dose ASA are indicated for PPI while on NSAID and/or ASA

Mitigating Cost

Avoid brand-name NSAID products when possible (Cambia®, Celebrex®, Flector® patch, Arthrotec®)

Replace combination agents (naproxen/esomeprazole or diclofenac/misoprostol) with individual agents

Cost Effective NSAIDs:
meloxicam, ibuprofen, naproxen, indomethacin (IR/ER), diclofenac sodium DR, ketorolac (IR), celecoxib