**ibuprofen (oral)**

### Classification

- Antipyretic, antirheumatic, nonopioid analgesics, nonsteroidal anti-inflammatory agents

### Pregnancy Category

- C (up to 30 wk gestation), D (starting at 30 wk gestation)

### Indications

**PO, IV:** Treatment of: Mild to moderate pain, Fever. **PO** Treatment of: Inflammatory disorders including rheumatoid arthritis (including juvenile) and osteoarthritis, Dysmenorrhea. **IV** Moderate to severe pain with opioid analgesics. Closure of a clinically significant PDA in neonates weighing 500–1500 g and 32 weeks gestational age (ibuprofen lysine only)

### Action

Inhibits prostaglandin synthesis. **Therapeutic Effects:** Decreased pain and inflammation. Reduction of fever.

### Pharmacokinetics

**Absorption:** Oral formulation is well absorbed (80%) from the GI tract; IV administration results in complete bioavailability. **Distribution:** Does not enter breast milk in significant amounts. **Protein Binding:** 99%. **Metabolism and Excretion:** Mostly metabolized by the liver; small amounts (1%) excreted unchanged by the kidneys. **Half-life:** Neonates: 26–43 hr; Children: 1–2 hr; Adults: 2–4 hr.

### Side Effects

- **CNS:** Headache, dizziness, intraventricular hemorrhage (ibuprofen lysine), psychic disturbances.
- **EENT:** Amblyopia, blurred vision, tinnitus.
- **CV:** Arrhythmias, edema, hypertension.
- **GI:** GI bleeding, hepatitis, constipation, dyspepsia, nausea, vomiting, abdominal discomfort.
- **GU:** Cystitis, hematuria, renal failure.
- **Derm:** Exfoliative dermatitis,

### Contraindications/Precautions

- **Contraindicated in:** Hypersensitivity (cross-sensitivity may exist with other NSIDs, including aspirin); Active GI bleeding or ulcer disease; Chewable tablets contain aspartame and should not be used in patients with phenylketonuria; Peri-operative pain from coronary artery bypass graft (CABG) surgery; OB: Avoid after 30 wk gestation (may cause premature closure of fetal ductus arteriosus). **Pedi:** Ibuprofen lorn: Preterm neonates with untreated infection, congenital heart disease where patency of PDA is necessary for pulmonary or systemic blood flow, Hydrops, thrombocytopenia, coagulation defects, necrotizing enterocolitis, significant renal dysfunction.

### Use Cautiously in:

- Cardiovascular disease (may risk of cardiovascular events);
- Renal or hepatic disease, dehydration, or patients on nephrotoxic drugs (may risk of renal toxicity); Aspirin triad patients (asthma, nasal polyps, and aspirin intolerance); can cause fatal anaphylactoid reactions; OB: Use cautiously up to 30 wk gestation; avoid after that; Lactation: Use cautiously; Pedi: Safety not established for infants <6 mo (oral) and children <17 yr (IV Caldolor); Ibuprofen lysine: Hyperbilirubinemia in neonates (may displace bilirubin from albumin binding sites).

### Exercise Extreme Caution in:

- History of GI bleeding or Glucagon disease.

### Adverse Reactions/Side Effects

- **CNS:** Headache, dizziness, intraventricular hemorrhage (ibuprofen lysine), intracranial hemorrhage (ibuprofen), thrombocytopenia, encephalopathy, seizures, pseudotumor cerebri, encephalopathy, sorbitol,
- **CV:** Arrhythmias, edema, hypertension, Gl tract bleeding, hypotension, congestive heart failure, thrombocytopenia, coagulation defects, necrotizing enterocolitis, gastrointestinal bleeding, hyperbilirubinemia, jaundice, hematuria, renal failure.
- **Derm:** Exfoliative dermatitis,
Pediatric OTC Dosing

PO (Children 2–3 yr/24–35 lb): 200 mg q 6–8 hr.
PO (Children 4–5 yr/36–49 lb): 250 mg q 6–8 hr.
PO (Children 6–8 yr/40–59 lb): 300 mg q 6–8 hr.
PO (Children 9–10 yr/60–71 lb): 325 mg q 6–8 hr.
PO (Children 11 yr/72–95 lb):做成 by 50 mg q 6–8 hr.
PO (Children 12–13 yr/96–115 lb): 62.5 mg q 6–8 hr.
PO (Children 14–16 yr/116–147 lb): 75 mg q 6–8 hr.
PO (Children 17–18 yr/148 lb and up): 100 mg q 6–8 hr.

PO (Infants <1 mo): None; restrict to use as ordered and monitor for signs of intolerance.
PO (Infants 1–6 mo): 15 mg/kg/dose q 6–8 hr.
PO (Infants 6–12 mo): 20 mg/kg/dose q 6–8 hr.
PO (Children 2–3 mo): 10 mg/kg/dose q 6–8 hr.
PO (Children 3–5 mo): 15 mg/kg/dose q 6–8 hr.
PO (Children 6–11 mo): 20 mg/kg/dose q 6–8 hr.
PO (Children 12–17 mo): 25 mg/kg/dose q 6–8 hr.
PO (Children 18–23 mo): 30 mg/kg/dose q 6–8 hr.
PO (Children 24–35 mo): 35 mg/kg/dose q 6–8 hr.
PO (Children 36–47 mo): 40 mg/kg/dose q 6–8 hr.
PO (Children 48–59 mo): 45 mg/kg/dose q 6–8 hr.
PO (Children 60–71 mo): 50 mg/kg/dose q 6–8 hr.
PO (Children 72–95 mo): 75 mg/kg/dose q 6–8 hr.
PO (Children >95 mo): 100 mg/kg/dose q 6–8 hr.

NURSING IMPLICATIONS

Assessment

- Patients who have asthma, aspirin-induced allergy, and nasal polyps are at increased risk for developing hypersensitivity reactions. Assess for rhinitis, asthma, and urticaria.
- Assess for signs and symptoms of GI bleeding (gastric ulcers, hemorrhagic gastritis, hypotension), renal dysfunction (elevated BUN and creatinine levels, decreased urine output), and hepatic impairment (abnormal liver enzymes, jaundice). Rare higher risk for poor outcomes or death from clinical bleeding. Age-related renal impairment increases risk of kidney and renal toxicity.
- Assess patient for skin rash (frequent) during therapy. Discontinue ibuprofen at first sign of rash; may be life-threatening. Stevens-Johnson syndrome or toxic epidermal necrolysis may develop. Treat symptomatically, may occur once treatment is stopped.
- Pain: Assess pain (type, location, and intensity) prior to and 1–2 hr following administration.
- Allergic: Assess pain and range of motion prior to and 1–2 hr following administration.
- Fever: Monitor temperature; note signs associated with fever (shivering, tachycardia, tachypnea).

PDA Closure

- No significant effect on PDA closure or outcome was noted after ibuprofen administration.
CONTINUED

ibuprofen (injection)

- Serum potassium, BUN, serum creatinine, alkaline phosphatase, LID, AST, and ALT may show ↑ levels. Blood glucose, hemoglobin, and hematocrit concentrations, leukocyte and platelet counts, and CO2 may be ↓.
- May cause prolongation of bleeding time, may persist for 1 day following discontinuation.

Potential Nursing Diagnoses

- Acute pain (Indications)
- Impaired physical mobility (Indications)
- Ineffective thermoregulation (Indications)

Implementation

- Administer in a sterile manner with aseptic technique.
- Administration of higher than recommended doses does not provide increased pain relief but may increase incidences of side effects.
- Patients should be well hydrated before administration to prevent renal adverse reactions. Do not give to neonates with urine output < 0.6 mL/kg/hr.
- Use lowest effective dose for shortest period of time, especially in the elderly.
- Coadministration with opioid analgesics may have additive analgesic effects and may permit lower opioid doses.
- PO: For rapid initial effect, administer 30 min before or 2 hr after meals. May be administered with food, milk, or antacids to decrease GI irritation. Tablets may be crushed and mixed with fluids or food; 800-mg tablet can be dissolved in water.
- Dysmenorrhea: Administer as soon as possible after the onset of menses. Prophylactic treatment has not been shown to be effective.

IV Administration

- Intravenous Infusion: Diluent: 0.9% NaCl, D5W, or LR. Concentration: Ibuprofen injection: Dilute the 800 mg dose in at least 200 mL and the 400 mg dose in at least 100 mL for a concentration of 4 mg/mL. Ibuprofen lysine: Dilute in appropriate volume of D5W or 0.9%NaCl and infuse over 15 minutes. Do not administer solutions that are discolored or contain particulate matter. Stable for up to 24 hr at room temperature. Rate: Infuse over at least 30 min.

Patient/Family Teaching

- Advise patients to take ibuprofen with a full glass of water and to remain in an upright position for 15–30 min after administration.
- Instruct patient to take medication as directed. Take missed dose as soon as remembered but if more than 1 hr overdue do not double dose. Pedi: Teach parents and caregivers to calculate and measure doses accurately and to use measuring device supplied with product.
- May cause drowsiness or dizziness. Advise patient to avoid driving or other activities requiring alertness or response to medication upon levation.
- Caution patient to avoid the concurrent use of alcohol, aspirin, acetaminophen, and other OTC or herbal products without consulting health care professional.
- Advise patient to inform health care professional of medication regimen prior to treatment or surgery.
- Instruct patient not to take OTC ibuprofen preparations for more than 10 days for pain or more than 3 days for fever, and to consult health care professional if symptoms persist or worsen. Many OTC products contain ibuprofen, avoid duplication.
- Caution patient that use of ibuprofen with 3 or more glasses of alcohol per day may increase the risk of GI bleeding.
- Advise patient to consult health care professional if rash, itching, visual disturbances, tinnitus, weight gain, edema, appetite suppression, headaches, or hypertension occurs. Caution patient to avoid the concurrent use of alcohol, aspirin, acetaminophen, and other OTC or herbal products without consulting health care professional.
- Pedi: Advise parents or caregivers not to administer ibuprofen to children who may be dehydrated (can occur with vomiting, diarrhea, or poor fluid intake); dehydration increases risk of renal dysfunction.
- Advise female patients to notify health care professional of pregnancy if planned or suspected.

Evaluation/Desired Outcomes

- Decrease in severity of pain.
- Improved joint mobility. Partial arthritic relief is usually seen within 7 days, but maximum effectiveness may require 1–2 wk of continuous therapy. Patients who do not respond to one NSAID may respond to another.
- Reduction in fever.

Why was this drug prescribed for your patient?