

**PHB**



**Dr. Arvind Kumar Gupta**  
(M.Pharm, PDCR, PGDMM & Ph.D)  
GATE 2003 Qualified with 97.2 percentile  
Dr. S. N. Dev College of Pharmacy  
Shamli (U.P.)

**OFFICE:** BUILDING No. 3/314, OFFICE-1, GAUSHALA ROAD, SHAMLI DISTRICT SHAMLI (U.P.) – 247776

**Mobile:** +91-9719638415

**Email:** arindrkgit@gmail.com

**Course Name : D. Pharm**  
**Year : Second Year**  
**Subject Name : Pharmacology**  
**Topic Name : NSAIDs**

Nonsteroidal anti-inflammatory drugs (NSAIDs) are a class of medications commonly used to reduce pain, inflammation, and fever. They work by inhibiting the enzymes cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2), which are involved in the synthesis of prostaglandins, substances that promote inflammation, pain, and fever.

**Classification:** NSAIDs can be classified into several categories based on their chemical structure and selectivity for COX enzymes. Common subclasses include:

**A. Nonselective COX inhibitors (traditional NSAIDs)**

- 1. Salicylates:** e.g. Aspirin
- 2. Propionic acid derivatives:** e.g. Ibuprofen, Naproxen, Ketoprofen, Flurbiprofen.
- 3. Anthranilic acid derivative:** e.g. Mephenamic acid
- 4. Aryl-acetic acid derivatives:** e.g. Diclofenac, Aceclofenac.
- 5. Oxicam derivatives:** e.g. Piroxicam, Tenoxicam.
- 6. Pyrrolo-pyrrole derivative:** e.g. Ketorolac
- 7. Indole derivative:** e.g. Indomethacin.
- 8. Pyrazolone derivative:** e.g. phenylbutazone, Oxyphenbutazone

**B. Preferential COX-2 inhibitors:** e.g. Nimesulide, Meloxicam, Nabumeton.

**C. Selective COX-2 inhibitors:** e.g. Celecoxib, Etoricoxib, Parecoxib.

**D. Analgesic-antipyretics with poor antiinflammatory action:**

- 1. Para aminophenol derivatives:** e.g. Paracetamol
- 2. Pyrazolone derivative:** e.g. Metamizol, Propiphenazone.
- 3. Benzoxazocine derivative:** e.g. Nefopam

**Mechanism of Action:**

- NSAIDs inhibit the activity of COX enzymes, which are responsible for converting arachidonic acid into prostaglandins.
- Prostaglandins are lipid mediators involved in inflammation, pain sensitization, and regulation of various physiological processes.
- Inhibition of COX enzymes reduces the synthesis of prostaglandins, leading to decreased inflammation, pain, and fever.

### **Dose:**

- The dosage of NSAIDs varies depending on the specific medication, formulation, and patient characteristics such as age, weight, and renal function.
- Dosages are typically adjusted based on the severity of symptoms and the desired therapeutic effect.
- It's essential to follow the recommended dosing instructions provided by healthcare professionals or on the medication label.

### **Uses:**

- **Relief of pain:** NSAIDs are commonly used to alleviate mild to moderate pain associated with conditions such as headaches, musculoskeletal injuries, menstrual cramps, and arthritis.
- **Reduction of inflammation:** NSAIDs help reduce inflammation in conditions such as arthritis (e.g., osteoarthritis, rheumatoid arthritis), tendonitis, bursitis, and acute injuries.
- **Reduction of fever:** NSAIDs can lower fever by inhibiting prostaglandin synthesis in the hypothalamus, which regulates body temperature.

### **Contraindications:**

- NSAIDs are contraindicated in individuals with known hypersensitivity or allergy to the drug or its components.
- History of asthma, urticaria, or allergic reactions to aspirin or other NSAIDs (cross-reactivity may occur).
- Active peptic ulcer disease or gastrointestinal bleeding.
- Severe renal impairment or kidney disease (NSAIDs can impair renal function and cause fluid retention).
- Pregnancy (especially in the third trimester) due to the risk of fetal harm, particularly with aspirin and certain other NSAIDs.
- Patients with a history of cardiovascular events or thrombotic disorders may require caution, especially with long-term or high-dose NSAID use.