اللهم بردا وسلاما على
غزة وأهلها

Palestine

Post-OP Analgesia

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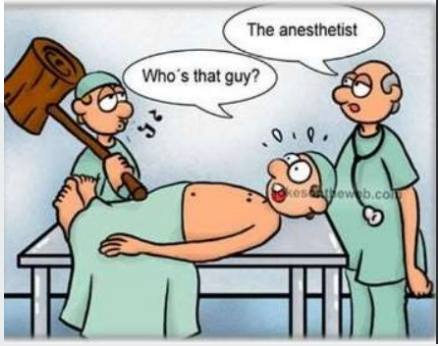


Simply ,

what is the “post-op Analgesia ” ?

A multimodal approach using a combination of analgesics from different classes to manage postoperative pain. when the effects of local anesthesia wears off.

Definition of pain

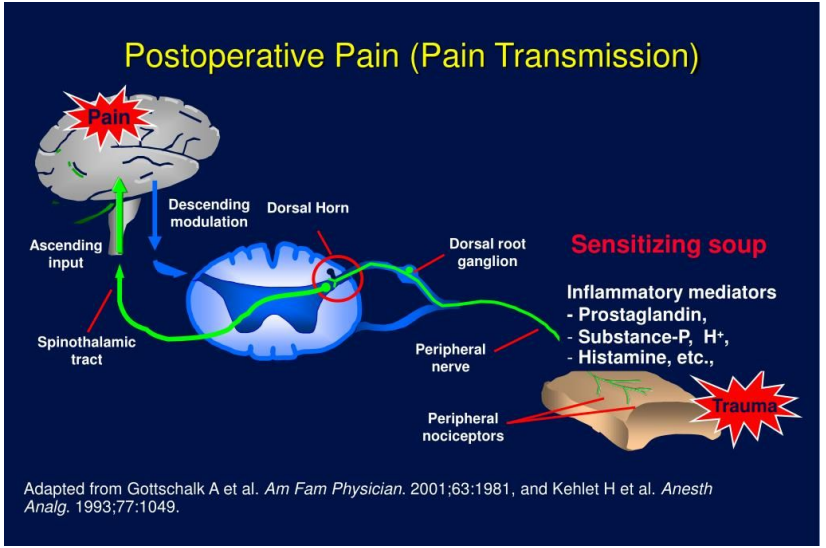
An unpleasant sensory and emotional experience associated with actual or potential tissue damage.

In adult moderate pain to be more present (61.0%) .’Pub-Med’

Pathophysiology of postoperative pain

The physiology of postoperative pain involves transmission of pain impulses via splanchnic (not vagal) afferent fibers to the: central nervous system, where they Initiate spinal. brainstem, and cortical reflexes Brainstem responses to pain include alterations

in Acute postoperative pain is a normal response to surgical intervention and is a cause of delayed recovery and discharge as well as increased risk of wound infection and respiratory/cardiovascular complications.



Etiology

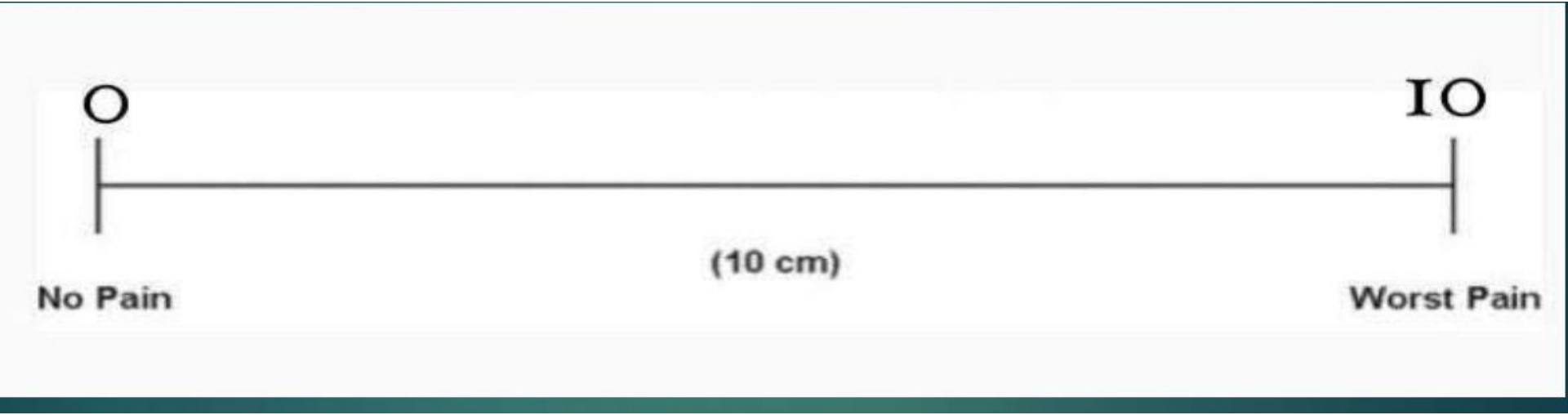
Post-surgery pain is a type of neuropathic (nerve) pain which is thought to result from injury to a major peripheral nerve during a surgical procedure. Surgery involves the cutting of tissues and nerves, which activate the body's automatic injury responses such as inflammation. Sometimes, these reactions can result in changes to how the nervous system processes pain signals, which can lead to chronic pain

Aim of post operative analgesia

Postoperative pain management aims to:

- Minimise patient discomfort
- Facilitate early mobilisation
- Prevent acute pain developing into chronic pain
- Reduce length of hospital stay

Visual Analogue scale (VAS)



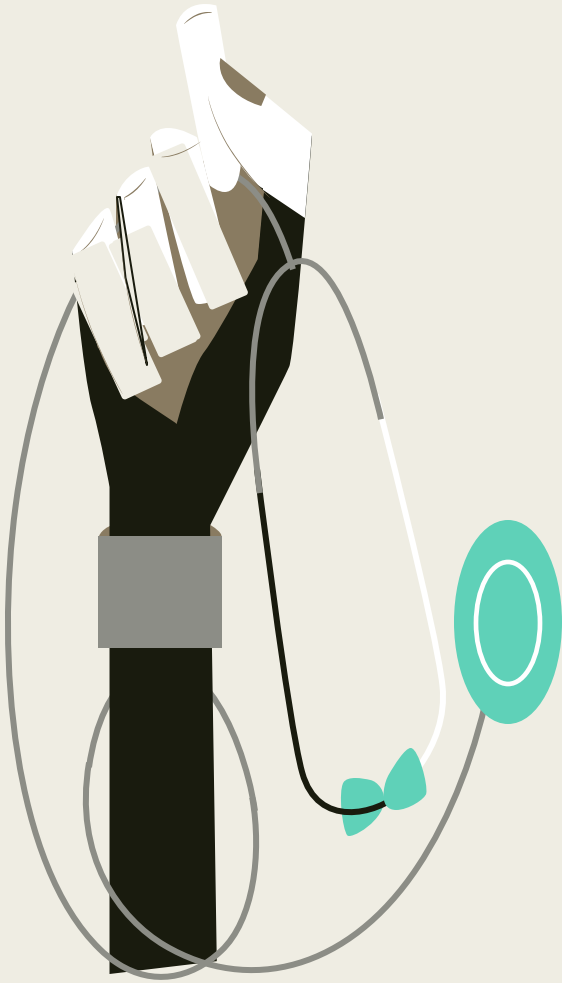
CHOICE OF POST OPERATIVE ANALGESIA!!!

MADE BY HUDA HDAYAT

Choice of post operative analgesia

Patient factors :

- Allergy
- Age
- Pre operative analgesics and pre existing pain
- Regular medications and potential interactions with analgesics prescribed
- Co-morbidities
- Renal/hepatic impairment
- Mental health and opioid dependence
- Factors limiting delivery or absorption of analgesics; rheumatism, ileus



Choice of post operative analgesia

Surgical factors:

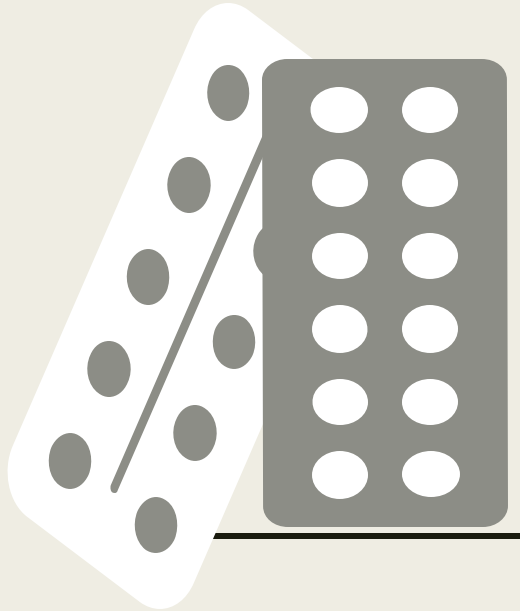
- Elective vs emergency
- Expected day case vs planned inpatient admission
- Consider the consequence of specific surgery on absorption, metabolism or elimination of analgesic

MULTIMODAL

The best treatment plan for a patient's postsurgical pain is the multimodal approach. By using a combination of the medications and techniques, the physician is able to create a personalized treatment plan that takes into account the patient's personal and medical needs.

Below is a list of treatments utilized for the multimodal treatment of pain in postsurgical patients:

- **Systemic pharmacologic therapy**
- **Local, Intra-articular, or topical techniques**
- **Regional anesthetic techniques**
- **Neuraxial anesthetic techniques**
- **Nonpharmacologic therapies- ex, cognitive modalities, physical therapy, transcutaneous electrical nerve stimulation (TENS)**

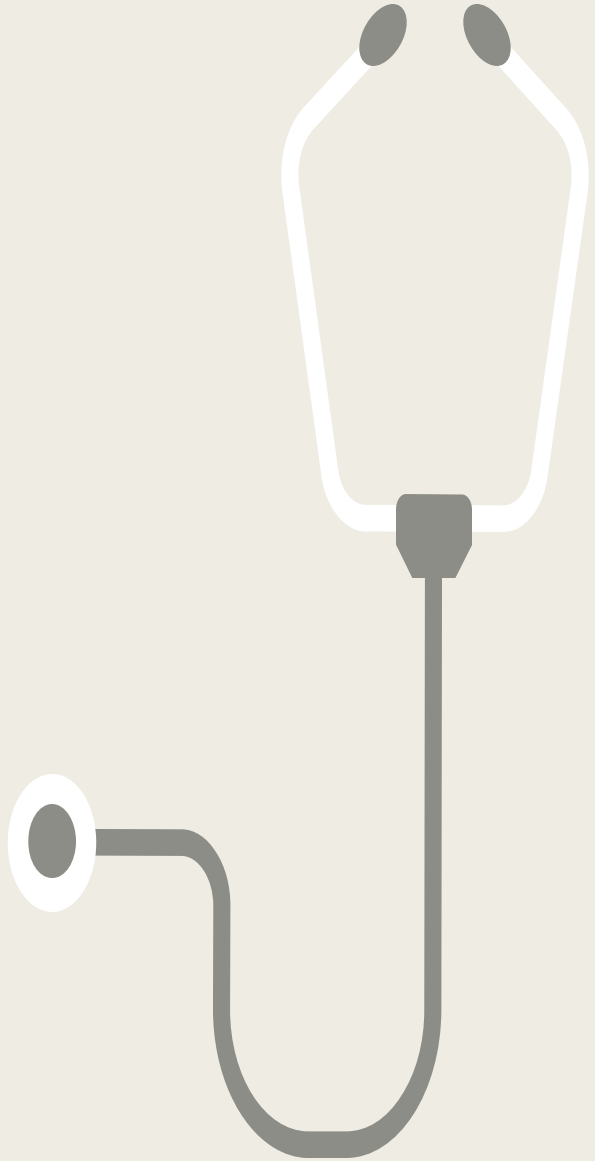


Paracetamol

Paracetamol is a selective cyclooxygenase-3 (COX-3) inhibitor that exerts a central analgesic effect through the activation of the descending serotonergic pathways. This drug is an effective analgesic agent and has no side effects that are observable in opioids or non steroidal anti-inflammatory drugs (NSAIDs).

Rout of admonstration:

- Oral
- Rectal
- Injectable formulation



However, because of the low cost of paracetamol as well as the lower incidence of side effects compared to the drugs commonly used such as morphine, the use of the former drug is preferred

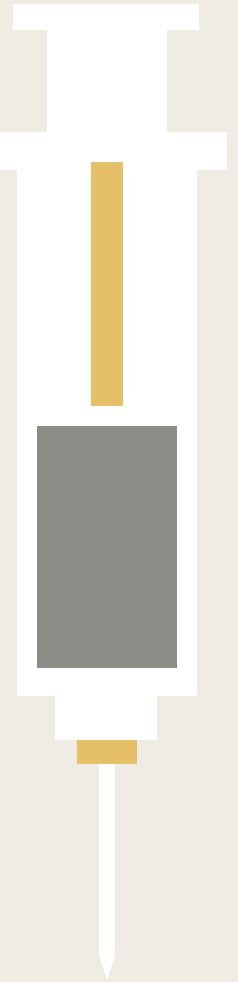
Local anaesthetic blockade

It involves blocking the activity of sympathetic nerves alongside the spine.
The sympathetic nervous system mainly controls unconscious actions such as h eart rate, blood flow, and perspiration.

: Central neuraxial blocks
The three most commonly used neuraxial techniques are :
spinal, epidural, and combined spinal-epidural (CSE)

peripheral nerve block :
It can be used to numb a part of the body (often an arm or a leg) for a procedure.
It may also help control pain after the procedure

Intra-articular :
Lidocaine, bupivacaine, and ropivacaine are examples of amides and
are the most commonly used local anesthetics in peripheral joint injections.



Analgesics:

Non-steroidal anti-inflammatory drugs (NSAIDs)

- NSAIDs are class of drugs having the capacity to suppress the signs and symptoms of inflammation (anti-inflammatory effect).

- They also are effective option for regular Anasthesia For mild and moderate pain.

- Therefore, these drugs are mainly indicated to relief pain, swelling, redness and stiffness caused by inflammation.

❤ Done by : Sadeen Shaher ❤

Mechanism of action

- NSAIDs act by inhibiting cyclooxygenase enzymes that catalyze first step in prostanoids biosynthesis, leading to decreased PGs synthesis with both beneficial & unwanted effects.

- Most NSAIDS are non-selective i.e. they inhibit both Cox-1 and Cox-2 . Their anti-inflammatory action is due to inhibition of Cox-2, but side effects are due to inhibition of Cox-1

ANTI-INFLAMMATORY DRUGS

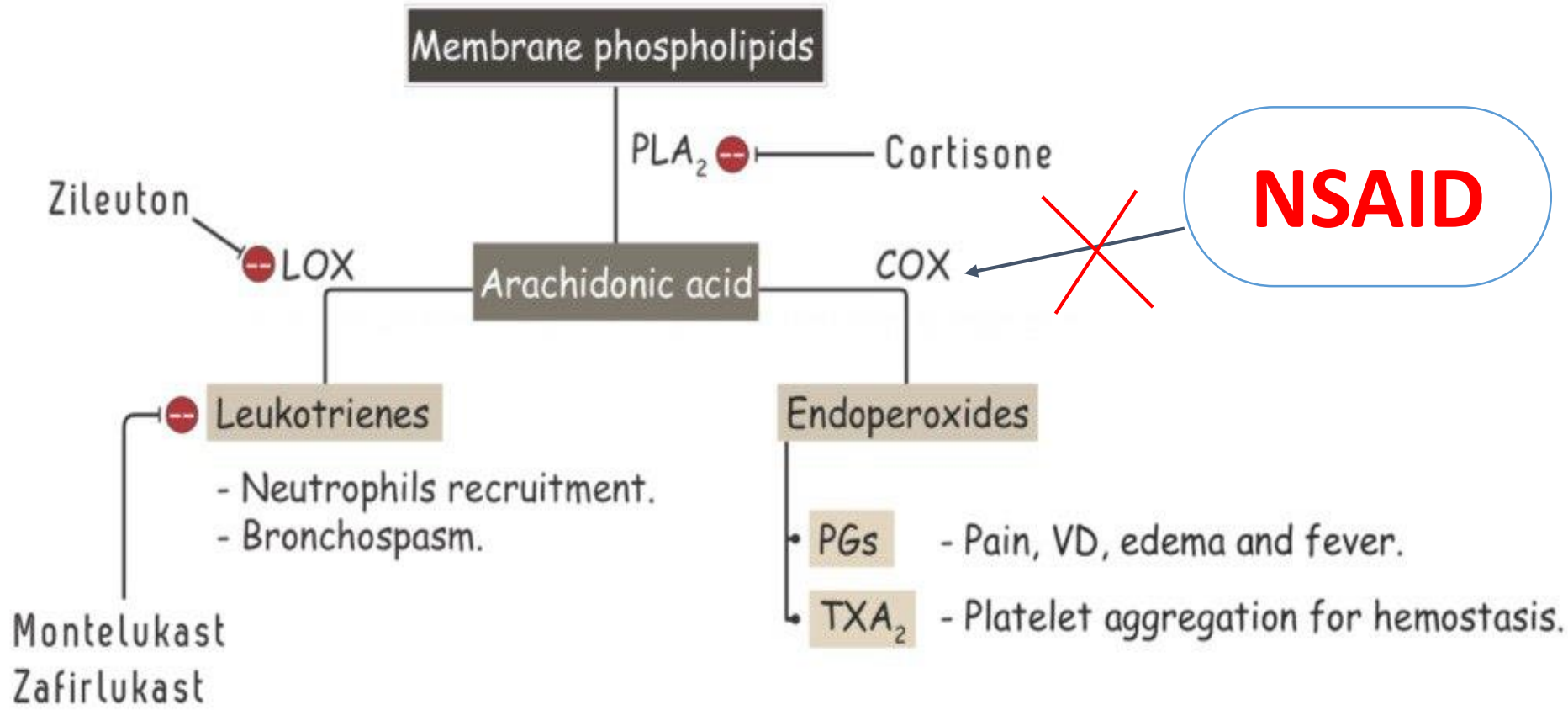
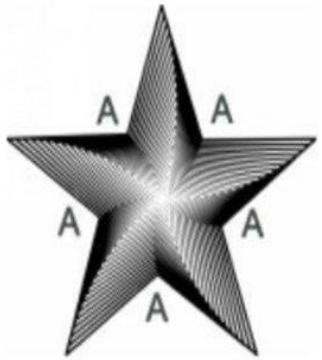


Figure 3-1 Inflammatory mediators

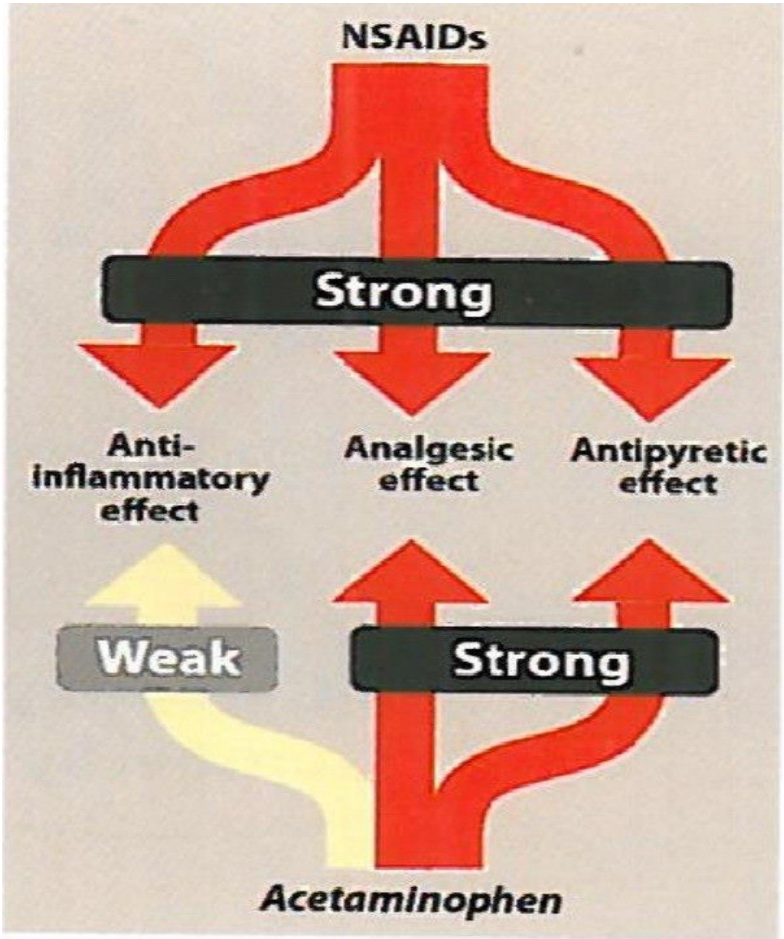
Therapeutic uses

Beneficial Effects Of Inhibition of Prostaglandin Synthesis i.e. Acetaminophen And NSAIDS (5 A's)



Analgesia
Antipyretic
Anti-inflammatory
Antithrombotic
Arteriosus

(NSAIDs for closure of patent ductus arteriosus)



- The **NSAIDs** are *grouped in several* **chemical classes;**

Salicylates

Acetylsalicylic Acid (Aspirin) (Aspirin®)

Diflunisal (Dolobid®) | **Salsalate** (Disalcid®)

Propionic Acid Derivatives (Profens)

Ibuprofen (Advil®) | **Dexibuprofen** (Extragesic®) | **Ketoprofen** (Ketofan®)

Dexketoprofen (Dextrafast®) | **Flurbiprofen** (Nalfon®) | **Fenoprofen** (Nalfosab®)

Loxoprofen (Roxogesic®) | **Naproxen** (Aleve®) | **Oxaprozin** (Daypro®)

Acetic Acid Derivatives

Indomethacin (Indocid®) | **Diclofenac** (Voltaren®) | **Aceclofenac** (Bristaflam®)

Ketorolac (Ketolac®) | **Etodolac** (Etodine®) | **Sulindac** (Clinoril®)

Tolmetin (Rumatol®) | **Nabumetone** (Nabuxan®)

Enolic Acid Derivatives (Oxicams)

Piroxicam (Feldene®) | **Tenoxicam** (Epicotil®) | **Lornoxicam** (Xefo®)

→ **Meloxicam** (Mobic®) | **Droxicam**

Fenamic Acid Derivatives

Mefenamic Acid (Ponstan®) | **Meclofenamic Acid** (Meclomen®)

Tolfenamic Acid (Fastgraine®) | → **Flufenamic Acid**

Other Agents

Metamizole (Dipyrone) (Novalgin®) | **Nimesulide** (Sulide®)

Selective COX-2 Inhibitors (Coxibs)

Celecoxib (Celebrex®) | **Rofecoxib** (Vioxx®)*

Valdecoxib (Bextra®)* | **Parecoxib** (Dynastat®)*

Drug available include:

- Non selective: ibuprofen, diclofenac, naproxen, ketorolac.
- Selective: Parecoxib.
- NSAIDs are available as: Oral medications such as tablets, capsules and liquids. Topical creams, gels, and ointments.

- Many NSAIDs are available and all can cause serious adverse effects, but ibuprofen, diclofenac and naproxen are relatively safe and cover most requirements.

- Ibuprofen has the lowest incidence of side effects, is the cheapest of these drugs and may be bought without prescription. its useful in children as an analgesic and antipyretic, especially when paracetamol is insufficient.

>Ibuprofen< dosage 1.2–1.8g daily in 3–4 divided doses (max 2.4g daily).

- Diclofenac (oral or rectal) 75–150mg daily in 2–3 divided doses.

- Naproxen 500mg initially, then 250mg 6–8-hourly (max 1.25g daily).

- Some NSAIDs may be given by injection for musculoskeletal pain (eg acute low back pain), or for renal or biliary colic. NSAIDs provide effective analgesia for renal colic, but the onset is slower than with IV opioids, which some prefer.

- ketorolac is widely used during the Perioperative period for short-term treatment of acute pain and as an adjunct to opioids for the treatment of moderate to severe postoperative pain , - Morphine like potency

< Ketorolac> may be given IM or slowly IV (initial dose 10mg over at least 15sec).

It is useful as an adjunct for MUAs.

- • Diclofenac must be given by deep IM injection (not IV , which causes venous thrombosis). Dose: 75mg, repeated if necessary after 30min

- NSAID gels or creams applied to painful areas provide some analgesia, but are less effective than oral treatment

NOTES:

- Maximal benefit occurs when the NSAID is continued for 3 to 5 days

- High dose of NSAIDs may cause CNS stimulation eg, confusion,dizziness and tinnitus.

- In Special Population !

  * NSAIDs should be used at the lowest effective dose for the shortest possible duration of therapy…

* Next slide !

- Pregnancy → 3rd trimesters, all NSAIDs should avoided
- Children → Ibuprofen is the most appropriate NSAIDs for children
- PDA – patent ductus arteriosus → Indomethacin or Ibuprofen
- Renal disease → all NSAIDs should be avoided in people with CKD

- if must be used : Sulindac , Aspirin, Ibuprofen appears to be the least nephrotoxic risk

- Renal stone (renal colic) → Diclofenac strongest in effectiveness in renal colic
- CVS → all NSAIDs are should be avoided

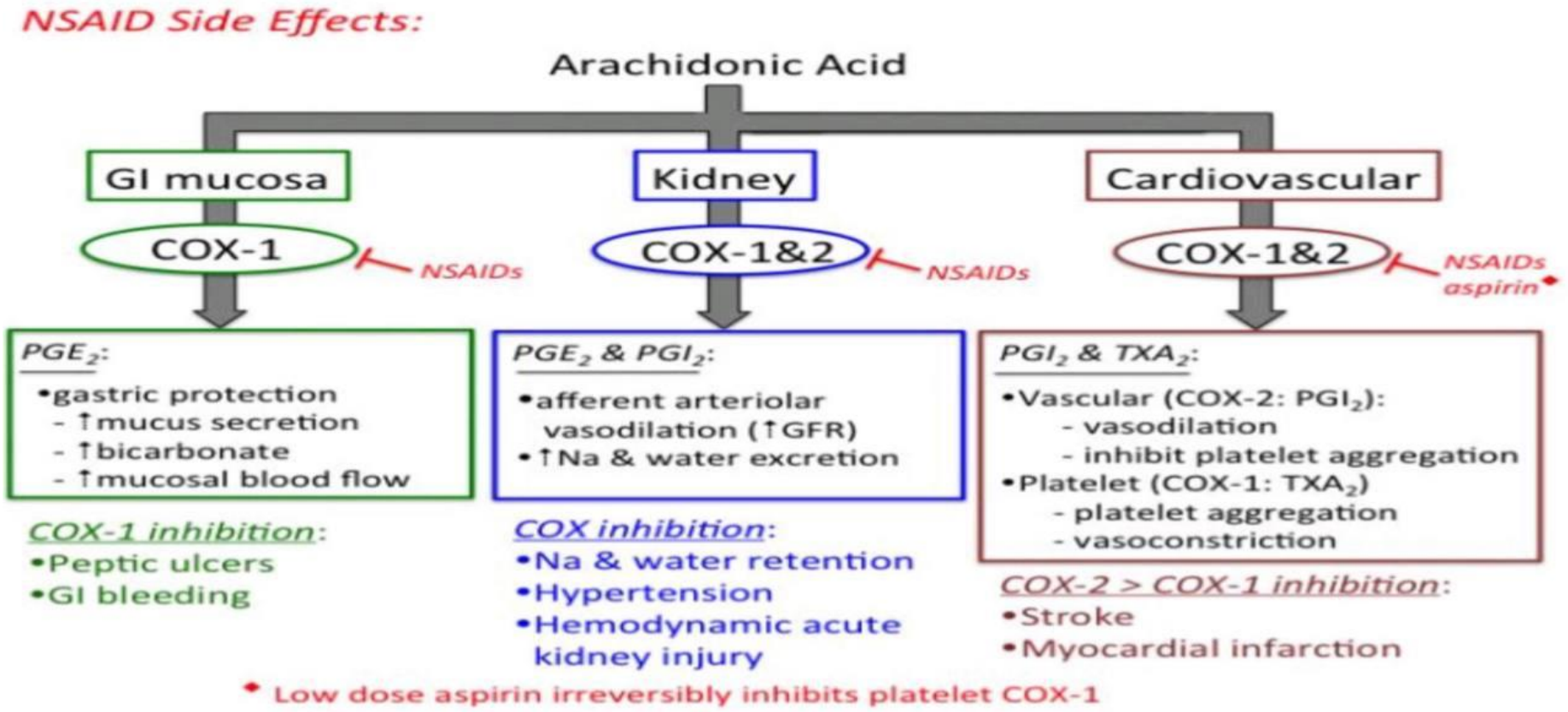
- If must be used : Naproxen appears to the least cvs risk.

- GIT → all NSAIDs are should be avoided

- If must be used : Ibuprofen , Celecoxib appears to the least gi risk

Possible side effects of NSAIDs include:

1. Indigestion – including stomach aches, feeling sick and diarrhea
2. Stomach ulcers – these can cause internal bleeding and anemia; extra-medicine to protect the stomach may be prescribed to help reduce the risk.
3. Headaches
4. Drowsiness
5. Dizziness
6. Allergic reactions



NSAID Contraindications

Nursing and pregnancy
Serious bleeding
Allergy/**A**sthma/**A**ngioedema
Impaired renal function
Drug (anticoagulant)

3rd trimester

- Acetaminophen Safe

- Delay labar
- low Birth wieght
- more hemmorage on past_partum.
- premature clousure of Ductus Arteriousus.

Overview of non-opioid analgesics			
	Common agents	**Activity profile**	**Side effects**

Nonsteroidal anti-inflammatory drugs (NSAID)	• **Ibuprofen**
	• **Diclofenac**
	• **Indomethacin**
	• **Naproxen**
	• **Ketorolac**
	• **Meloxicam**
	• **Piroxicam**
	• Sulindac
	• Aspirin
		• Analgesic
		• Antipyretic
		• Anti-inflammatory
		• Antiplatelet effect
			• Gastric and intestinal **ulcers**, bleeding, and perforation
			• **Renal function impairment**
			  ◦ Acute renal failure
			  ◦ Deterioration of chronic renal failure
			  ◦ Chronic analgesic nephropathy
			• **Increased risk of heart attack and stroke** (with the exception of aspirin and naproxen) [1]

COX-2 inhibitors (selective NSAID)	• Celecoxib	• Analgesic
		• Anti-inflammatory
			• **Increased cardiovascular risk**
			• Renal side effects
			  ◦ Deterioration of chronic renal failure
			  ◦ Increase in blood pressure

Other non-opioid analgesics	• Acetaminophen	• Analgesic • Antipyretic	• **Hepatotoxicity** ◦ Acute liver failure in cases of intoxication • Limited nephrotoxicity

OPIOIDS

DONE BY :SALSABEEL AL-LAYMOUN

OPIOIDS

Opioids are substances that act on opioid receptors to produce morphine-like effects.

Mechanism of action

- **Opioids produce analgesia by binding to specific G protein coupled receptors in brain & spinal cord**

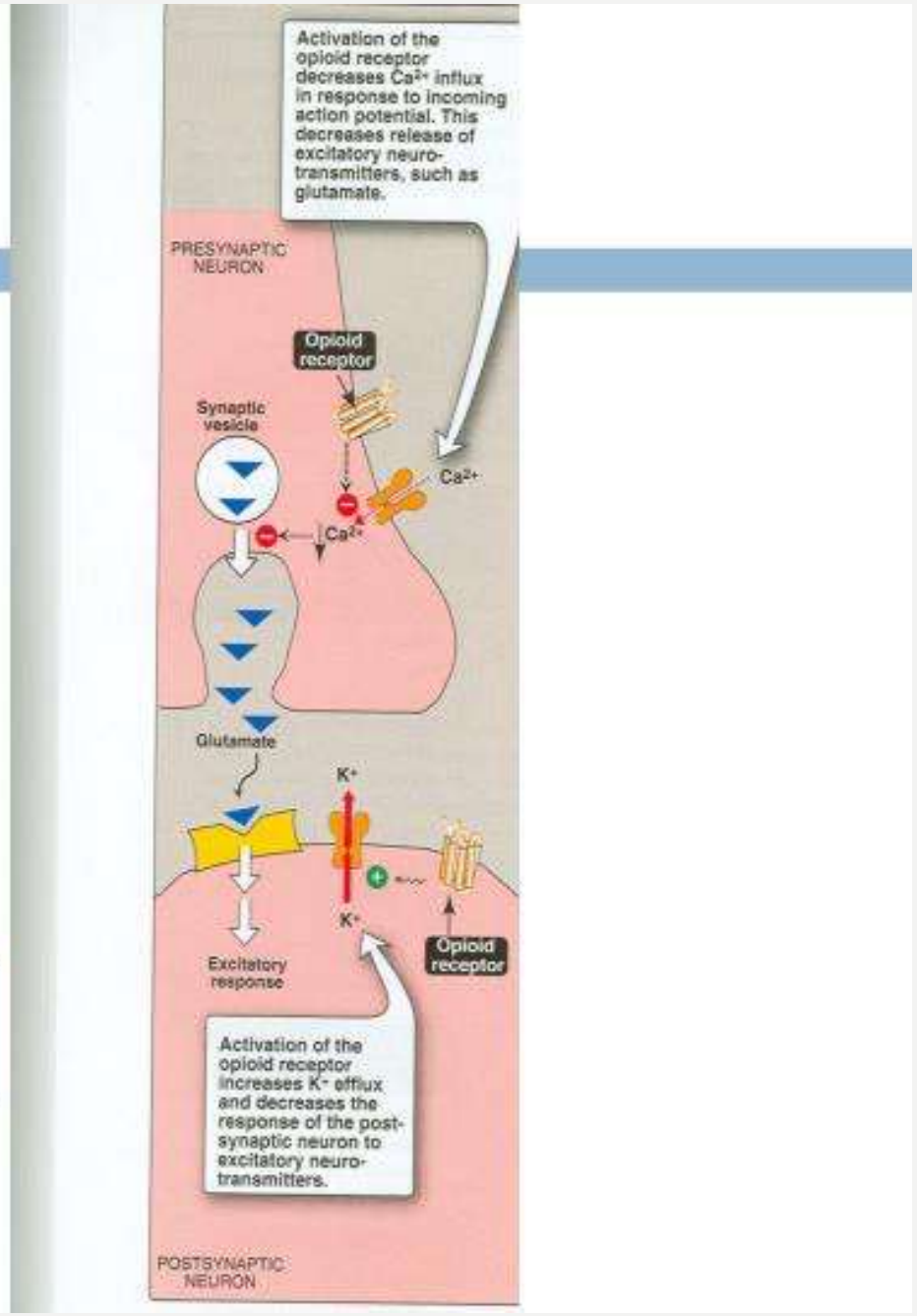
Mechanism of action

- **Receptors**
- **μ,δ, κ** receptors.
- All 3 subtypes are involved in antinociceptive and analgesic mechanisms at both spinal and supraspinal levels.
- μ receptors-respiratory depressant+ GI
- δ receptors- development of tolerance
- κ receptors- involved in sedation + GI

Ionic Mechanisms

- Presynaptic level close voltage gated Ca+ channels, and reduce transmission.
- Post synpatic level open K+ channels (inhibit post synaptic neurons).

Mechanism at Opioid receptors



CLINICAL USES

Medically they are primarily used for pain relief, including anesthesia.

Other medical uses include suppression of diarrhea, replacement therapy for opioid use disorder , reversing opioid overdose, and suppressing cough.

Naloxone is a medicine that can temporarily reverse the effects of an opioid overdose. (morphine)

ROUTE OF ADMINSTRATION OF OPIOIDS:

They can be administered via :

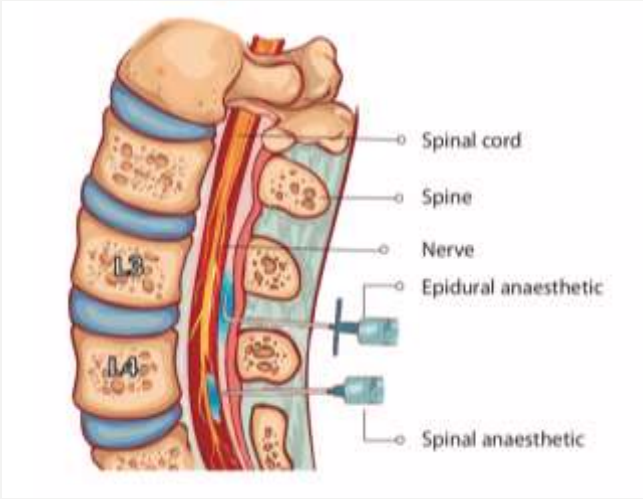
Oral

Transdermal

Parenteral

Neuraxial

rectal routes



IV opioids provide rapid and effective analgesia for patients with moderate to severe pain.

DRUG AVAILABLE INCLUDE:

The most commonly used intravenous opioids for postoperative pain are morphine, hydromorphone (dilaudid), and fentanyl.

MORPHINE

Morphine is the standarad choice for opiates and is widely used. It has a rapid onset of action with peak effect occurring in 1 to 2 hours.

Morphine is used to relieve severe pain, such as pain caused by:

a major trauma (for example, an accident)

surgery

labour pain in childbirth

cancer pain

Morphine should only be used when other forms of pain relief have not been successful in managing pain or if you are not able to take them (for example, because of side effects or because your doctor says you cannot take it together with another medicine that you are taking

FENTANYL

Fentanyl, is a highly potent synthetic piperidine opioid drug primarily used as an analgesic. Because fentanyl is 50 to 100 times more potent than morphine, its primary clinical utility is in pain management for cancer patients and those recovering from painful surgical operations.[6] Fentanyl is also used as a sedative.[7] Depending on the method of delivery, fentanyl can be very fast acting and ingesting a relatively small quantity can cause overdose.[8] Fentanyl works by activating mu-opioid receptors.

ADVERSE EFFECT OF OPIOID

Respiratory depression

Nausea and vomiting

Pruritus

Reduction in bowel motility leading to ileus and constipation

Longer-term use of opioids can lead to dependence and addiction

THANK YOU