

# Non opioids

- Acetaminophen
- Local anesthetic drugs
- Nonsteroidal anti-inflammatory drugs

→ No physical dependence

→ No tolerance

→ *Ceiling effect*

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# Acetaminophen

- Effective analgesic
- Action
  - Analgesic
  - Antipyretic
  - Anti-inflammatory agent
- Relative safety
- Effective for the musculoskeletal aches, joint stiffness



# Acetaminophen

- Disadvantage

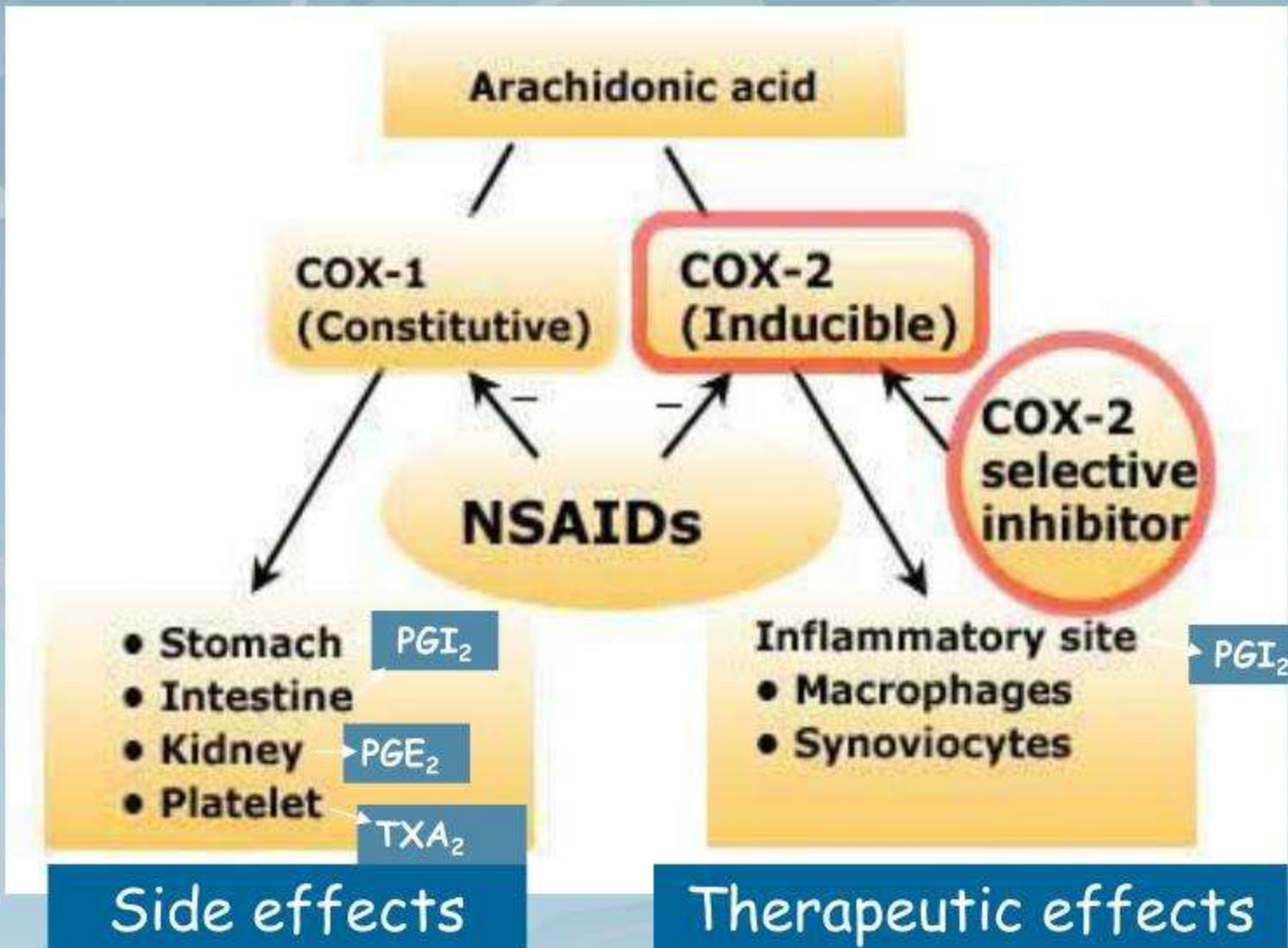
- Dose-dependent hepatotoxicity, GI upset
- Agranulocytosis

- Dosage

- 650-1000 mg PO q 4 hr.
- Max. 4 g/d

- Reduce dose 50-70% in patient with significant hepatic impairment

# NSAID



# NSAID

Drug	Dosage	Maximum daily dose
<b>Nonselective inhibitor</b> <ul style="list-style-type: none"><li>■ Diclofenac</li><li>■ Indomethacin</li><li>■ Ibuprofen</li></ul>	<ul style="list-style-type: none"><li>50 mg PO bid-tid</li><li>75 mg PO bid</li><li>200-800 mg q 6 hr.</li></ul>	<ul style="list-style-type: none"><li>200 mg</li><li>150 mg</li><li>3200 mg</li></ul>
<b>Cox-2 inhibitor</b> <ul style="list-style-type: none"><li>■ Celecoxib</li></ul>	<ul style="list-style-type: none"><li>100-200 mg PO bid</li></ul>	<ul style="list-style-type: none"><li>400 mg</li></ul>



# Contraindication of NSIAD

- Pre-existing renal impairment ( $\uparrow$ Cr)
- Cardiac failure
- Severe liver dysfunction
- Uncontrolled hypertension
- Aspirin-induced asthma
- History of GI bleeding
- Known hypersensitivity

# NSIAD used with caution

- High risk of intraoperative hemorrhage eg. Cardiac, major vascular, hepatobiliary surgery
- Impaired hepatic function, diabetes, bleeding or coagulation disorders, vascular disease.
- Pregnant and lactating woman
- Children < 16 or advanced age
- Concurrent used other NSIAD ,ACEI , cyclosporin, methotrexate



# Potential side effects of NSAID

- Operative site bleeding
- GI bleeding
- Renal tubular dysfunction
- Allergic reaction
- Bronchospasm
- Hypertension
- Pedal edema

# Corticosteroid

- Reduce pain in several ways
  - Reduce inflammation
  - Relieve nerve compression
  - Decrease spontaneous firing of sodium channels in neuromas
- Effective in
  - Pain **secondary to edema** (CNS ds.)
  - Prostaglandin-mediated pain (arthritis, bone metastasis)
- Not recommend for long term



# Local Anesthetics

- Techniques for L.A administration
- -Topical analgesia
- -peripheral nerve Block
- **-EPIDURAL=administration of medication into epidural space**
- **-INTRATHECAL=administration of medication into subarachnoid space**

# Technique for administering local anesthesia

## *Peripheral nerve blocks*

Ilioinguinal/hypogastric : herniorrhaphy

Paracervical : F&C, D&C, cone biopsy

Penile : circumcision

Brachial plexus : arm, hand

Intercostal/paravertebral : breast

Peribulbar/retrobulbar : eye



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# Sign & symptoms of Local anesthetic intoxication

- Cardiovascular depression
- Respiratory arrest
- Coma
- Convulsion
- Drowsiness → Unconscious
- Muscle twitching
- Tinnitus, visual disturbance
- Circumoral, tongue numbness
- Lightheadedness

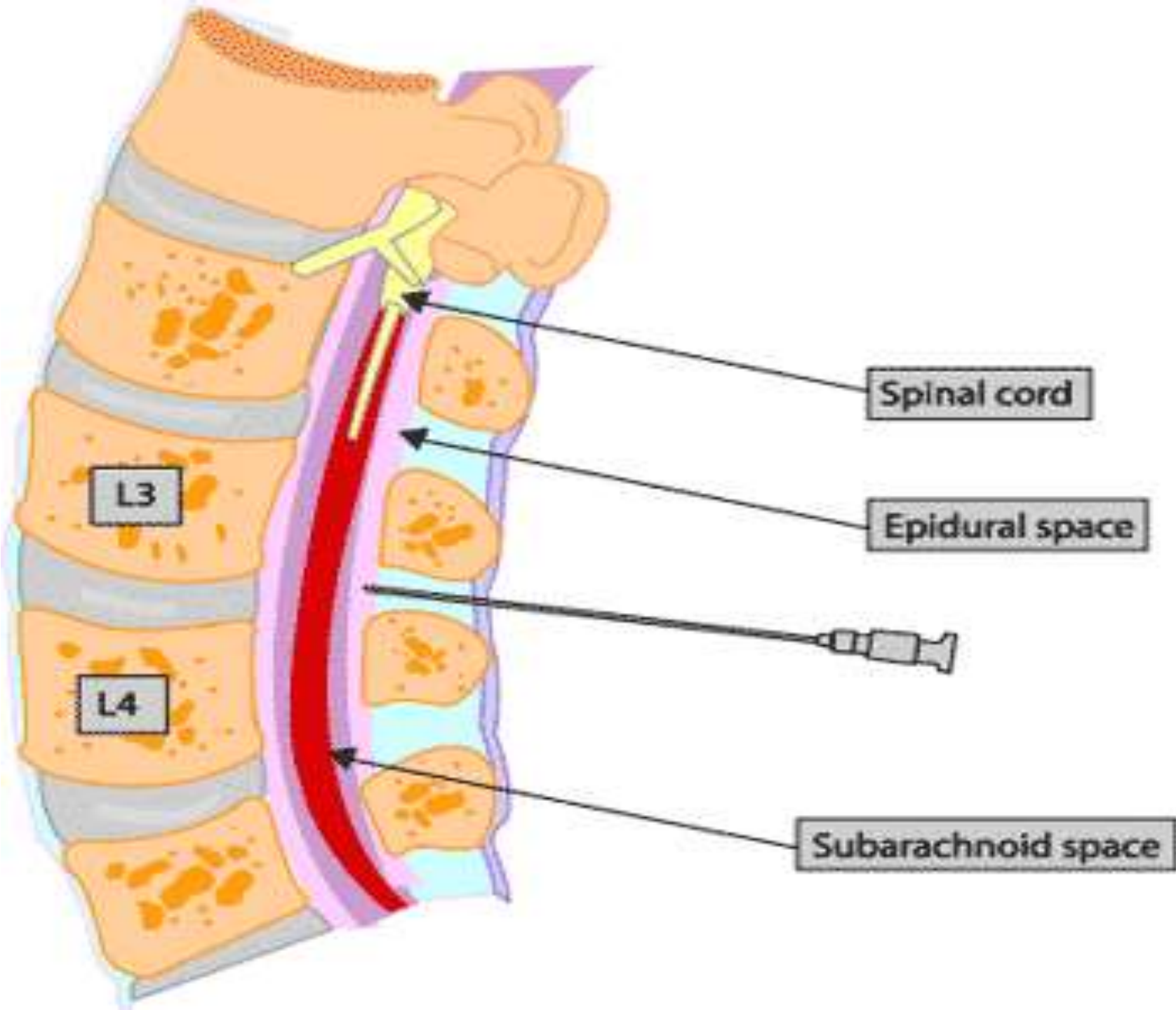


↑ Blood concentration



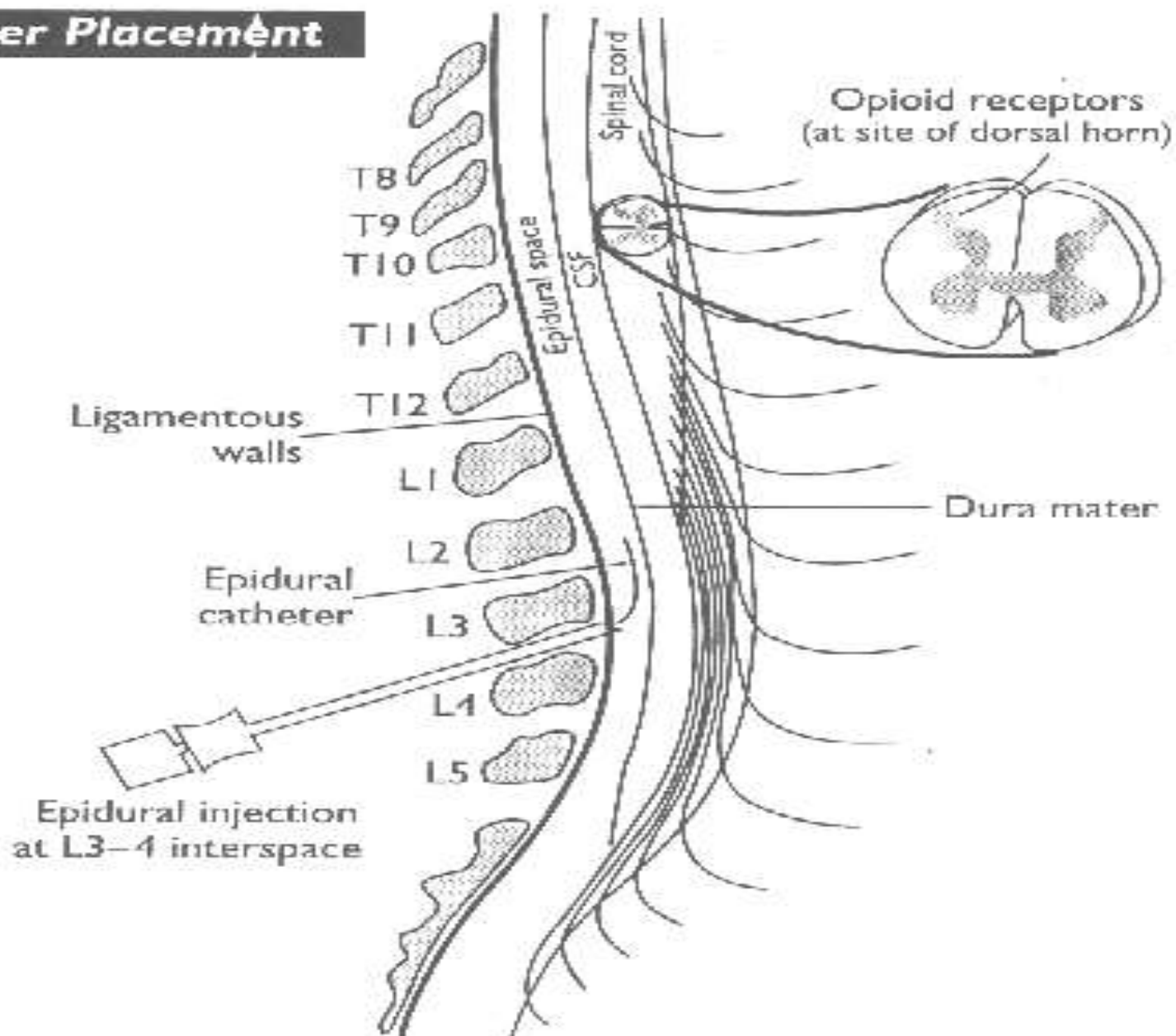
# **EPIDURAL SPACE**

- Potential space
- Between the dura mater, ligamentum flavum
- Made up of vasculature, nerves, fat and lymphatic
- Extends from foramen magnum to the sacrococcygeal ligament





## Catheter Placement



# **INDICATIONS**

- The objective of epidural analgesia is to relieve pain.

Major surgery

Trauma (# ribs)

Palliative care (intractable pain)

Labour and Delivery



# **CONTRAINDICATIONS**

- Patient refusal
- Known allergy to opioid or local anesthetic
- Infection/abscess near the proposed injection site
- Sepsis
- Coagulation disorder
- Hypotension / hypovolemia
- Spinal deformity/increased ICP

# INSERTION OF EPIDURAL CATHETER

- Positioning of patient
- The site is dependent upon the area of pain
- Fixing the catheter

<u>Incision</u>	<u>Level</u>
Thoracic	T4-T6
Upper abdo	T6-T8
Lower abdo	T8-T10
Pelvic	T8-T10
Lower extremity	L1-L4



# EPIDURAL CATHETERS



- Ideal Placement (adult) 10-12 cm at the skin
- Epidural catheters have markings that indicate their length.
  - = there is a mark at the tip of the catheter
  - = the 1st single mark up the catheter is 5cm
  - = double mark up the catheter is 10 cm
  - = triple mark on the catheter is 15 cm
  - = four mark together indicate 20cm

A change in depth of the catheter indicates migration either into or out of the epidural space.

## **MEDICATION COMMONLY USED**

- OPIOIDS-Fentanyl +Morphine  
(affect the pain transmission at the opioid receptors)
- L.A.-Bupivacaine(marcaine)  
(inhibits the pain impulse transmission in the nerves  
with which it comes in contact)



# **METHODS OF ADMINISTRATION**

- BOLUS (FENTANYL, DURAMORPH)
- CONTINUOUS INFUSION(MARCAINE+FENTANYL)
- All drugs administered epidural should be preservative free.
- All epidural opioids should be diluted with normal saline prior to intermittent bolus administration.

# **Motor and Sensory Assessment**

- Motor assessment
- Sensory assessment

# Motor and Sensory Assessment

## Sensory assessment:

- Use ice in the tip of a glove

- Start in upper neck and move down thorax bilaterally assessing all potential dermatomes

- Level of block is where intensity of cold changes or the cold sensation is absent

- assess the dermatomes below the pelvis



# Adverse Effects L.A

- Hypotension-
  - assess intravascular volume status
  - no trendelenberg positioning
- Teach patient to move slowly from a lying position to sitting to standing position.

## Treatment

- fluids

# Cont.

- Temporary lower-extremity motor or sensory deficits.  
**Tx: lower the rate or concentration.**
- Urine retention  
**Tx: catheter**
- Local anesthetic toxicity (neurotoxicity)  
**Tx: stop infusion.**

- Resp. insufficiency  
**Tx: stop infusion**
  - **ABC(100% o<sub>2</sub> call for help)**
  - **Assess spread and height of block**
  - **Alt. analgesia**

# OTHER COMPLICATIONS

- Headache (dural puncture)  
**Tx: symptomatic treatment**  
**Autologous blood patch**
- Infection
- nausea and vomiting.

- Intravenous placement of catheter
- Subdural placement of catheter
- Haematoma



# **EPIDURAL ANALGESIA(GUIDELINES)**

- **Collect items**
- **Assess patient**
- **Inspect site**
- **Wash hands**
- **Aspiration test – Glucose test**
- **Administer**
- **Document**
- **Evaluate the outcome**

**PATIENT CONTROL ANALGESIA**

## Acute Pain

❖ **Postop pain is a type of “Acute Pain”**

❖ **Recent onset,**

❖ **Limited duration,**

❖ **Has a causal relationship,**

❖ **Variable pain intensity,**

❖ **Variable response to analgesia**

} **PCA**



# Patient Controlled Analgesia

- PCA is based on the belief that patients are the best judges of their pain.
- They should be allowed an active role in controlling their pain.
- That pain relief should be secured as quickly as possible.

# P C A

PCA are modified infusion pumps that allow patient to self administer a small dose of opioid when pain is present , thus allowing patients to titrate their level of analgesia against the amount of pain they are experiencing.



# PATIENT SELECTION

- Patient should not be denied access to this modality simply because of age.
- Screen for cognitive and physical ability to manage their pain by using the PCA.
- Should have the understanding of pain relief , using the demand button and when to use the demand button.



# PATIENT SELECTION

PCA not offered to confused patient and those who become confused should have PCA discontinued.

The same patient selection guidelines and consideration for the use of PCA apply to children.

Important to remind parents and caregivers not to press the demand button .

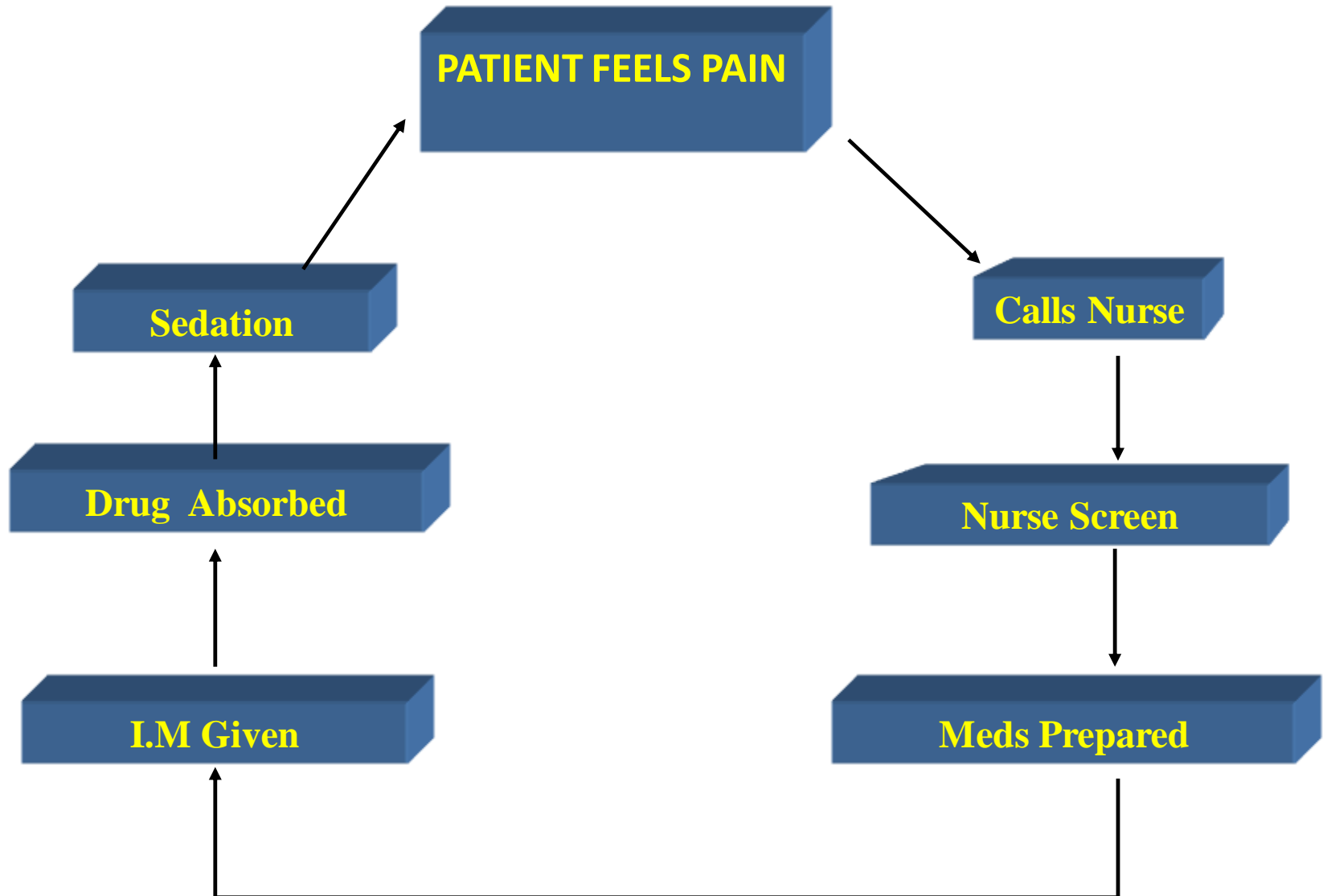


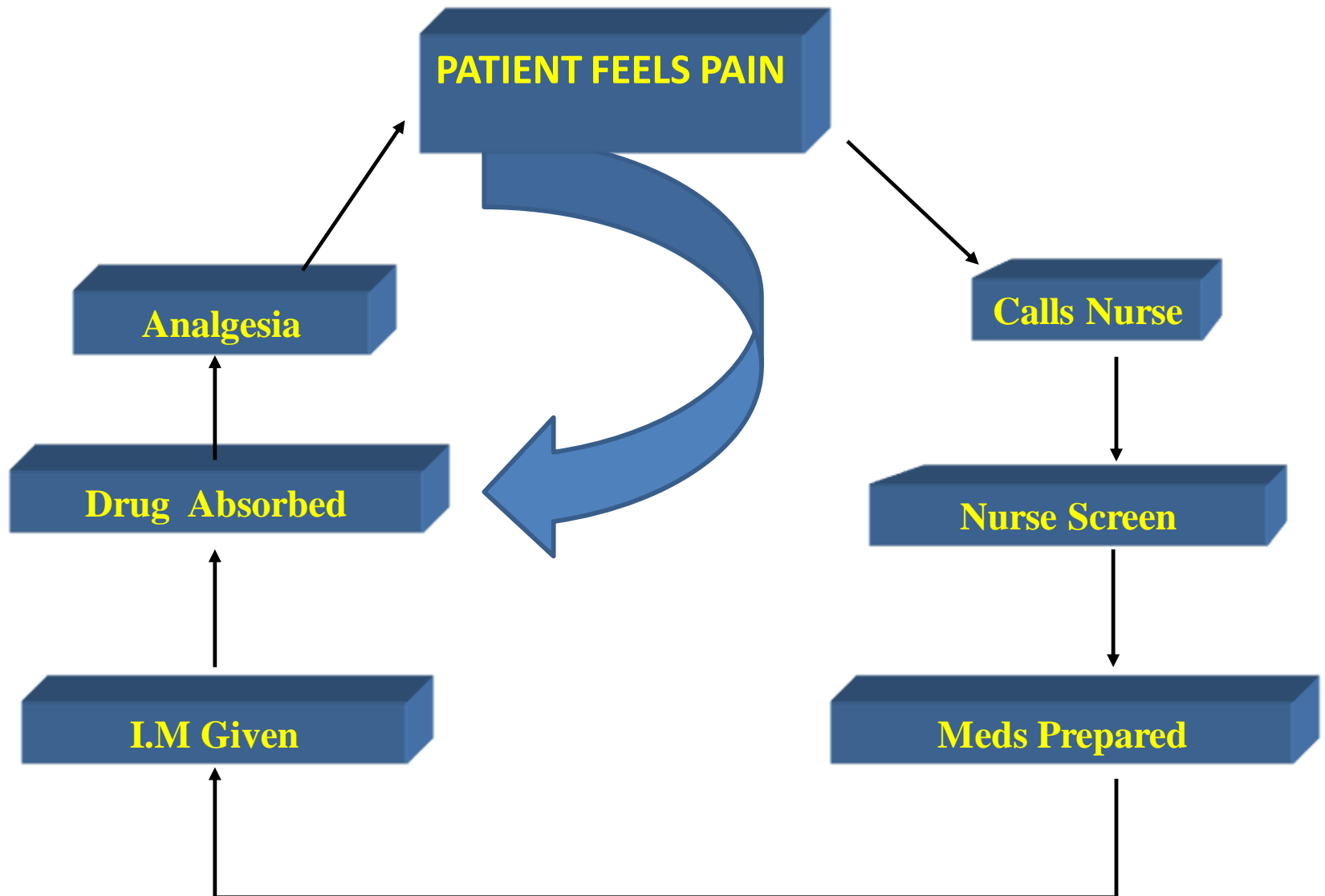
# P C A

- PCA is well tolerated.
- Offer flexibility in dose size and dose interval in individual patients.
- Therapeutic serum level can be reached relatively quickly because the drug is administered into the vascular system directly.

# PCA

- PCA allows patient control over their pain and therefore gives greater satisfaction.
- PCA also eliminates the lag time between pain sensation and administration of analgesia.





# PCA

- The pump documents the total number of mg of drug delivered, the number of times the patient requests a bolus and number of times medication is delivered in response to demands.
- This information is helpful when assessing whether the established PCA parameters are appropriate to patient's need.



# BENEFITS

- Decreased nursing time
- Increased patient satisfaction.
- Used in a variety of medical and post-op surgical conditions.
- Decreased narcotic usage.
- Decreased level of sedation.
- Earlier ambulation.

# BENEFITS

- Decreased overall pain scores reported by patients.
- Increased compliance to post op care.
- Less anxiety.
- More autonomy regarding pain control.
- Improved rest and sleep pattern

# Surgical pain

## *Surgical procedure*

### **Minor surgery**

Herniotomy  
Varicose vein  
Gynecological  
laparotomy

### **Moderate surgery**

Hip replacement  
Hysterectomy  
maxillofacial

### **Major surgery**

Thoracotomy  
Major abdominal  
surgery  
Knee surgery

Paracetamol /NSIADs  
Epidural anesthesia  
systemic opioids  
PCA

Paracetamol /NSIADs  
/ weak opioids

Wound infiltration

Peripheral nerve block

Paracetamol /NSIADs  
+Wound infiltration  
Peripheral nerve block  
Systemic opioids  
PCA

## *Treatment modality*