Non opioids

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

→No physical dependence

→No tolerance

→*Ceiling effect*

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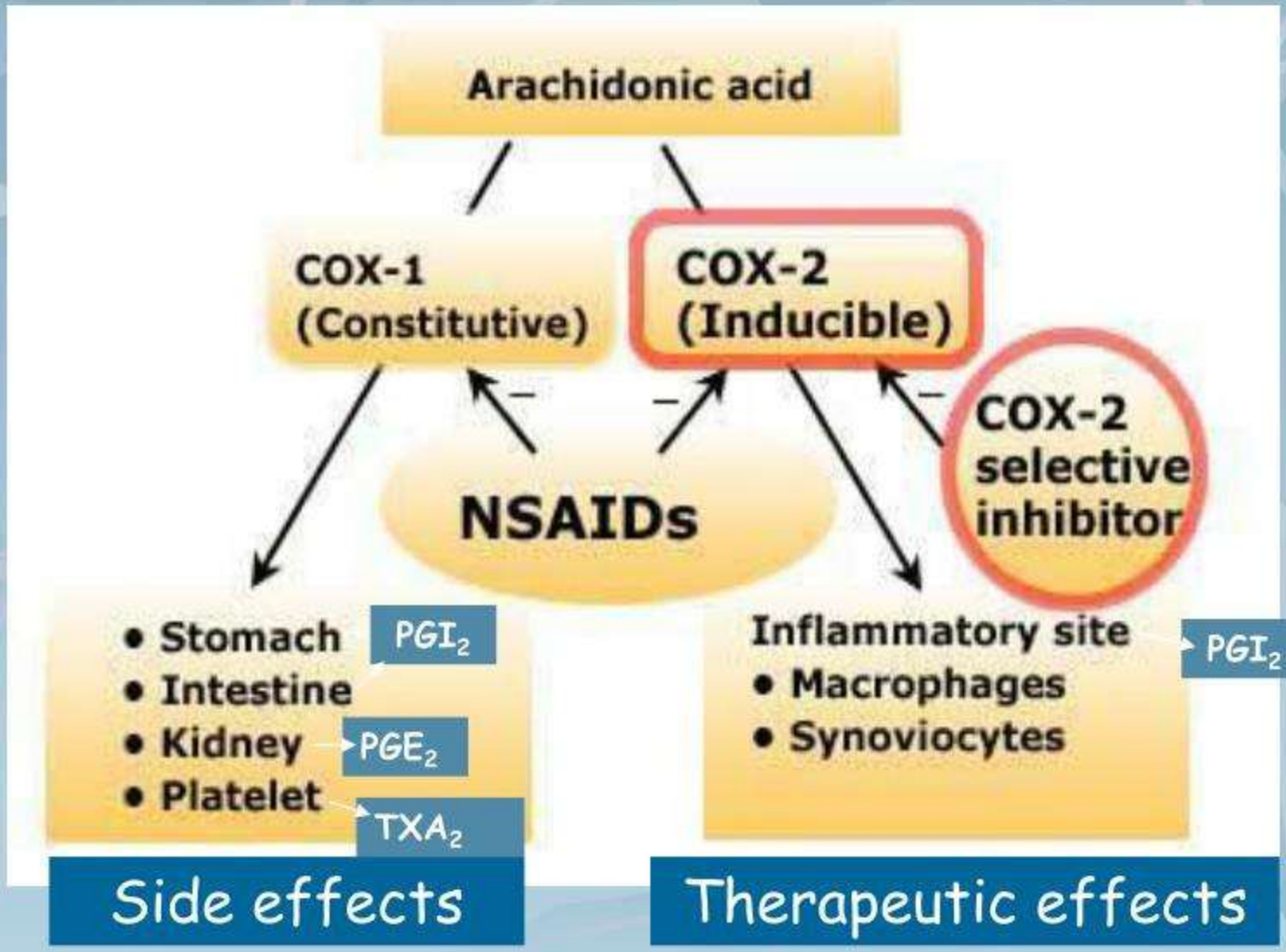
Acetaminophen

- 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


Arachidonic acid
COX-1 (Constitutive)
COX-2 (Inducible)
COX-2 selective inhibitor
NSAIDs
• Stomach
• Intestine
• Kidney
• Platelet
PGI2
PGE2
TXA2
Inflammatory site
• Macrophages
• Synoviocytes
PGI2
Side effects
Therapeutic effects

NSAID

Drug	Dosage	Maximum daily dose
Nonselective inhibitor		
▪Diclofenac	50 mg PO bid-tid	200 mg
▪Indomethacin	75 mg PO bid	150 mg
▪Ibuprofen	200-800 mg q 6 hr.	3200 mg
Cox-2 inhibitor		
▪Celecoxib	100-200 mg PO bid	400 mg

Contraindication of NSIAD

- Pre-existing renal impairment (⇧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

REVIEW ARTICLE WHITE ANESTH ANALG

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.)
  - Prostglandin-mediated pain (arthritis, bone metastasis)
- Not recommend for long term

Local Anesthetics

- Techniqes 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

REVIEW ARTICLE WHITE ANESTH ANALG
NON-OPIOID ANALGESICS AND ACUTE POSTOPERATIVE PAIN 2005;101:S5–S22

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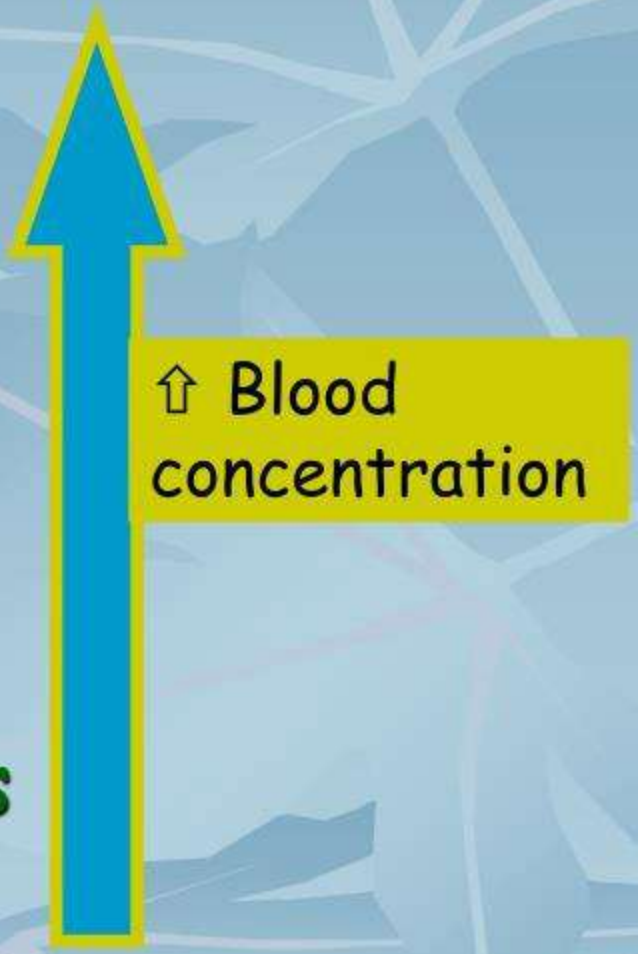
REVIEW ARTICLE WHITE ANESTH ANALG
NON-OPIOID ANALGESICS AND ACUTE POSTOPERATIVE PAIN 2005;101:S5–S22

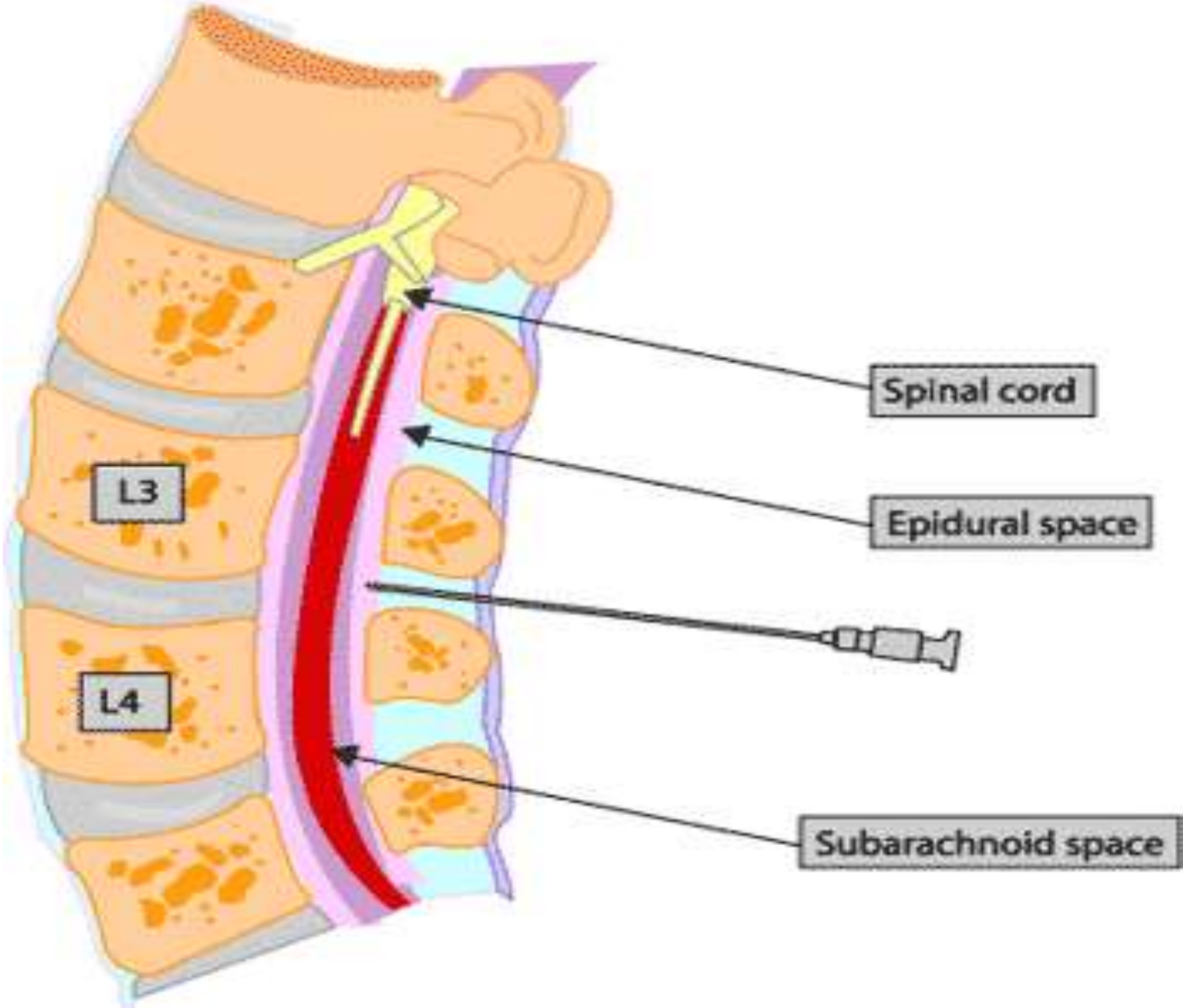
Sign &symptoms of Local anesthetic intoxication

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

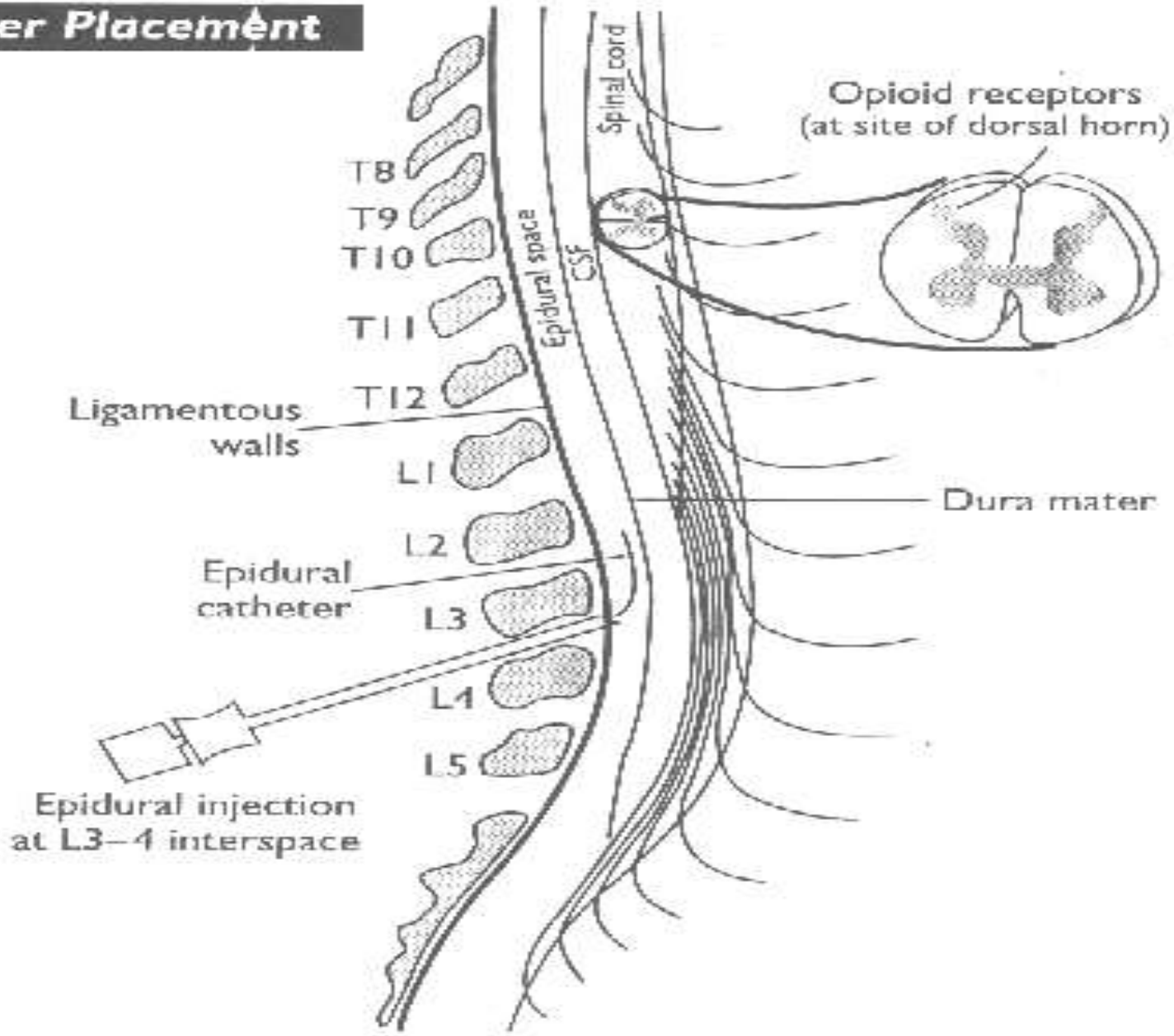


EPIDURAL SPACE

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


L3
L4
Spinal cord
Epidural space
Subarachnoid space

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

Incision	Level
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% o2 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 .

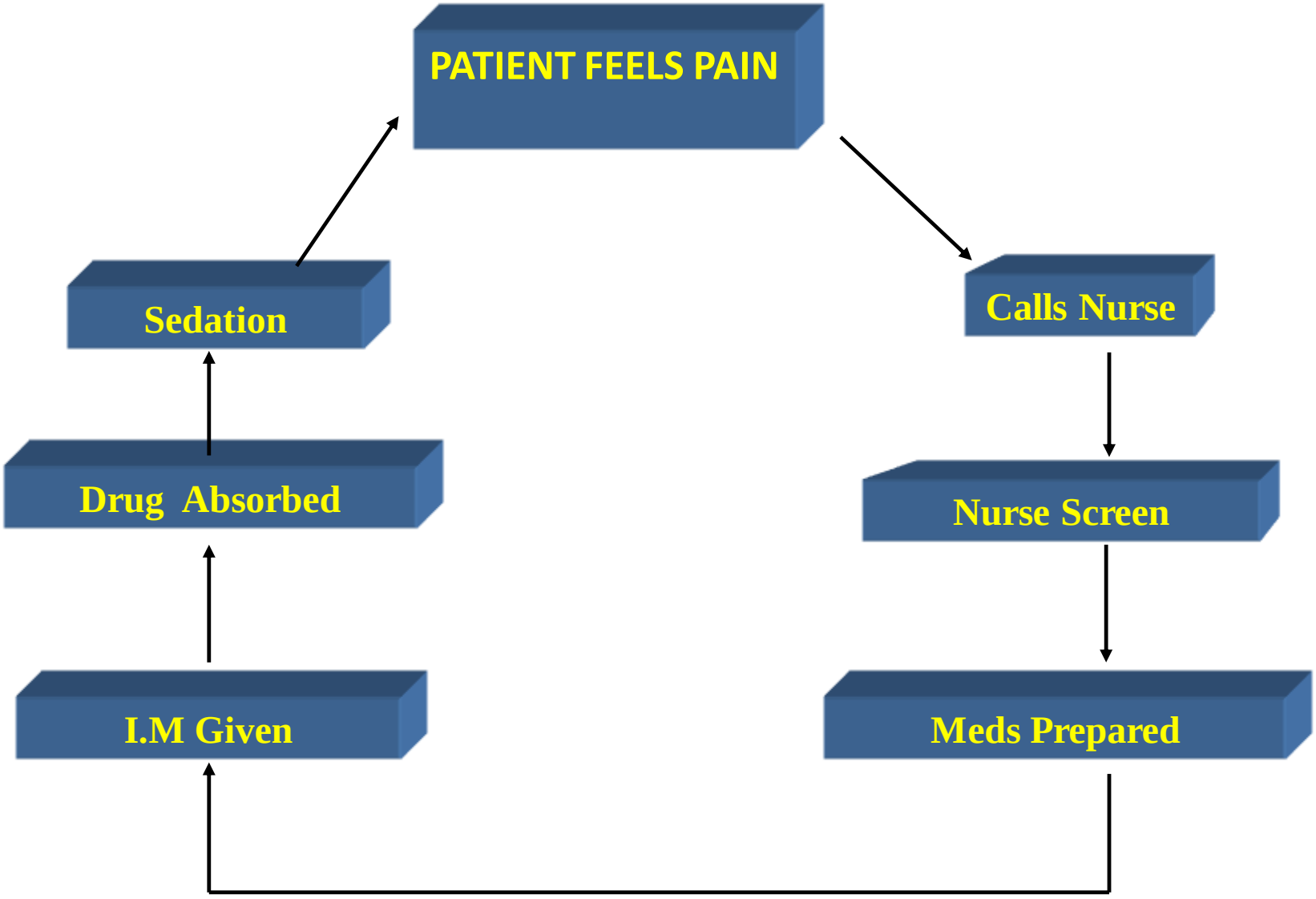
P C A

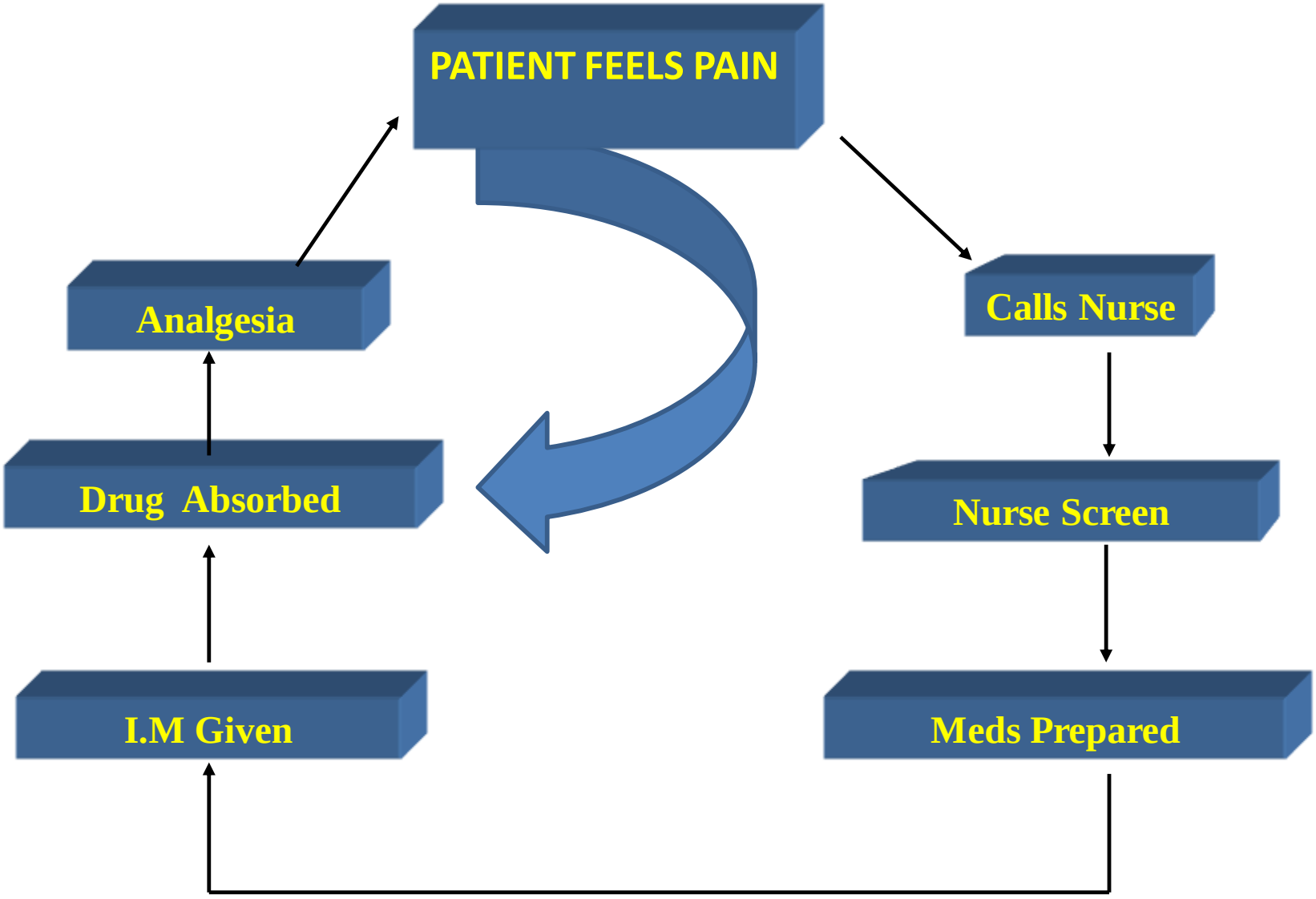
- PCA is well tolerated.
- Offer flexibility in dose size and dose interval in individual patients.
- Therapeutic serum level can be reached relatively quickly because the drug is administered into the vascular system directly.

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.


PATIENT FEELS PAIN
Calls Nurse
Nurse Screen
Meds Prepared
I.M Given
Drug Absorbed
Sedation


PATIENT FEELS PAIN
Calls Nurse
Nurse Screen
Meds Prepared
I.M Given
Drug Absorbed
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 / weak opiods

Wound infiltration

Peripheral nerve block

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

Paracetamol /NSIADs
Epidural anesthesia
systemic opioids
PCA

Treatment modality