TEAM

ANESTHESIA

435

Acute pain management

{Color index: Important★| Notes | Book | 433 Notes | Extra | Editing File}

Objectives:

- Not given

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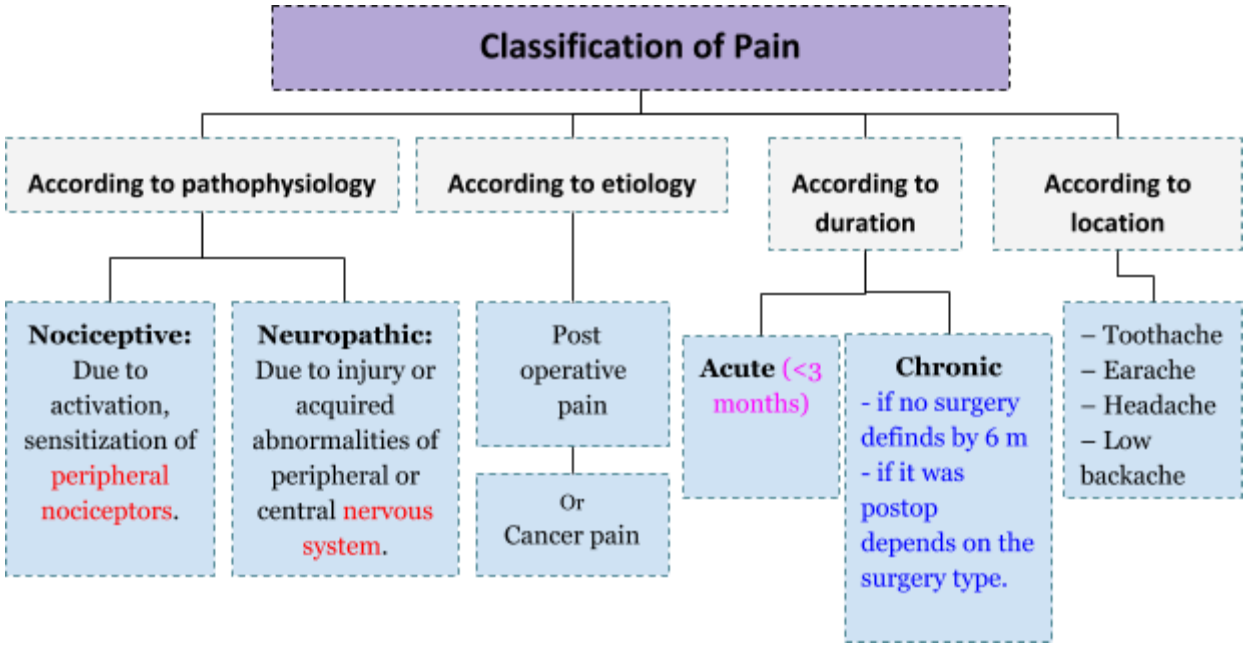
PAIN:

- It's an un unpleasant **sensory** and **emotional** experience associated with actual or potential tissue damage or described in terms of such damage.[1]
- Pain is the fifth vital sign
- Pain is **subjective** and difficult to quantify.
- The management of pain is a **multidisciplinary** team effort involving physicians, psychologists, nurses, and physical therapists.
- Unrelieved pain is morally and ethically unaccepted.

GOAL OF PAIN TREATMENT:

- Improve quality of the pt .
- Facilitate rapid recovery & return to full function .
- Reduce morbidity .
- Allow early discharge from hospital. Cost effective for both hospital and patients.



1. Acute pain (see here)

- Caused by noxious stimulation due to: injury, a disease process or abnormal function of **muscle or viscera**
- Recent onset, - Limited duration, - Has a causal relationship,
- It is nearly **always nociceptive** " he can point the site of pain". MCQ!
- Nociceptive pain serves to detect, localize and limit the tissue damage.
- Acute pain plays a useful positive **physiological** role by providing a warning of **tissue damage.**
- **Postoperative pain is a type of "Acute Pain"**[2][3]

[1] International association of study of pain 1979
[2] Pain following surgery is usually relatively short lived and significantly reduced in intensity by 48–72 hours.
[3] Although much of acute pain is postoperative, there are many other causes: preoperative surgical (renal colic, peritonitis), medical (acute MI) and trauma (rib fractures).

Types of acute pain: imp				
Type	**1. Somatic**		**2. Visceral:**	
Subtypes	• Superficial:	• Deep:	• Visceral: True localized or Referred	• Parietal: Localized or Referred
Origin	Nociceptive input from skin, subcutaneous tissue and mucous membranes	Arise from Muscles, Tendons and Bones	Due to disease process, abnormal function of internal organ or its covering, e.g. Parietal pleura, Pericardium or Peritoneum.	
Nature of pain	**Well localized** Sharp, pricking, burning and throbbing	Dull aching and is less well localized Intensity and Duration of stimulus affects the degree of localization	Dull, diffuse and in midline. Appendicitis pain starts in the umbilicus and then goes to RLQ. Frequently associated with abnormal **sympathetic** activity causing nausea, vomiting, sweating and changes in HR and BP.	Sharp, often described as stabbing sensation either localized to the area around the organ or referred to a distant site. In MI patient will complain of pain in right shoulder, jaw and epigastric pain. Why? Heart is supplied from T1 till T4.

Patterns of referred pain: (the dr. skipped this slide and mentioned heart innervation with another part)

Lungs	**T2 – T6**
Heart	**T1 –T4**
Aorta	**T1 –L2**
Esophagus	**T3 – T8**
Pancreas & Spleen	**T5 –T10**
Stomach, liver and gall bladder	**T6 –T9**
Adrenals	**T6 – L1**
Small intestine	**T6 – T9**
Colon	**T10 – L1**
Ureters	**T10 – T12**
Uterus	**T11 – T12**
Bladder and prostate	**S2 – S4**
Urethra & Rectum	**S2 – S4**
Kidneys, Ovaries & Testis	**T10 – L1**

The landmark of T4: Nipple. T10: Umbilicus. T6: xiphoid process

SYSTEMIC RESPONSES TO ACUTE PAIN *important*

Efferent limb of the pain pathway is

- Sympathetic nervous system
- Endocrine system.

CVS[4]:	• Tachycardia • Hypertension • Increased systemic vascular resistance A patient in the OR table complaining on pain, leading to what? Arrhythmia, MI, Stroke, bleeding. ASA1 can tolerate post operative pain well.
Respiratory:	• Increased oxygen demand and consumption • Increased minute volume • Splinting[5] and decreased chest excursion • Atelectasis, increased shunting, hypoxemia • Reduced vital capacity, retention of secretions and chest infection A patient in the OR table complaining on pain leading to what? Hypoxia, basal lung **atelectasis**, secretions, **postoperative pneumonia.** For abdominal and thoracic surgery, unresolved pain may cause the patient to breathe at low lung volumes. This, in combination with decreased ability to cough, results in basal airway closure and retention of pulmonary secretions, leading into a spiral of hypoxia, lung collapse and predisposition to pneumonia.
GIT and urinary:	• Increased sympathetic tone • Decreased motility, ileus and urinary retention • Hypersecretion of stomach • Increased chance of aspiration • Abdominal distension leads to decreased chest excursion A patient in the OR table complaining on pain leading to what? Paralytic ileus, Nausea and vomiting, aspiration pneumonia, Distended abdomen -> more atelectasis
Endocrine effect:	• Increase secretion of Stress hormones: Catecholamine, Cortisol and Glucagon • Decreased secretion of Insulin and testosterone. A diabetic patient with increasing stress hormone and decrease in insulin he'll get **hyperglycemia** leading to wound infection and prolonged hospital stay.
Hematologic:	• Increased platelet adhesiveness • Reduced fibrinolysis and hypercoagulability Increase risk of DVT and PE. due to decreased mobilization.
Immune:	• Leukocytosis • Lymphopenia • Depression of reticuloendothelial system Increase risk of infection and prolonged hospital stay.
General sense of well-being:	• Anxiety • Sleep disturbances • Depression These can resolve after treatment of the cause which is PAIN

[4] which are undesirable especially in patients with heart disease (e.g. angina).

[5] Respiratory splinting is defined as reduced inspiratory effort as a result of sharp pain upon inspiration (severe pleuritic chest pain). This can result in atelectasis post-operatively.

IMPACTS OF UNCONTROLLED ACUTE PAIN

Clinical Perspective:

- Delayed wound healing
- ↑ risk of pulmonary / CVS morbidity
- ↑ risk of thrombosis
- ↑ morbidity / mortality risk
- Sustained neuro-endocrinal stress response

Patient Perspective:

- ↑ Pt's suffering
- Fear and Anxiety
- Poor quality of life
- ↑ length of hospital stay
- ↑ Costs
- ↑ Risk of CPOP

2. Chronic pain

- Chronic pain is defined as that which persists **beyond**[6] the usual course of an acute disease or after a reasonable time for healing to occur. E.g. whipple surgery 1-2 months for healing anything beyond that is considered as chronic pain "Persistent postsurgical pain" .
- period varies between **6 or > months** in most definitions.
- Chronic pain may be **nociceptive**, **neuropathic**[7], or a **combination** of both. E.g. Sickle cell patients may have acute crisis on top of chronic chest and joint pain.
- Pt with chronic pain often have an **absent** neuroendocrine stress response. so he'll present with severe pain but his BP is ok HR is ok.
- Have prominent sleep and affective (mood) disturbances.
- Deafferentation pain vs. sympathetically mediated pain.

So Post-op chronic pain after 1-2 months, Others is 6 months or more.

Most chronic pain are headache then back pain

Chronic pain	Acute Pain
Lasts longer than expected	
Is uncoupled from the causative event	Is caused by external or internal injury or damage
Becomes a disease in its own right	It can be easily located.
Its intensity no longer correlates with a causal stimulus	Its intensity correlates with the triggering stimulus Depends on the surgery (major vs. minor).
Has lost its warning and protective function	Has a distinct warning and protective function
Is a special therapeutic challenge that requires **interdisciplinary** procedures	self-limiting process and is usually a clinical entity for only a few days

[6] chronic pain persists longer than the expected time of healing and becomes the illness itself rather than a symptom of it.
[7] which is caused by central nervous system dysfunction, and often results in pain long after any painful stimulus has disappeared.

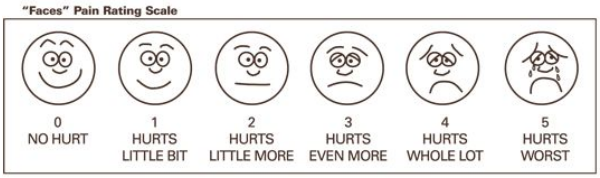
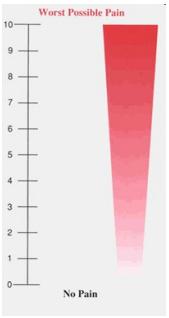
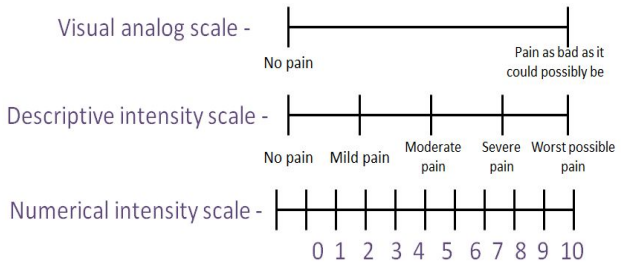
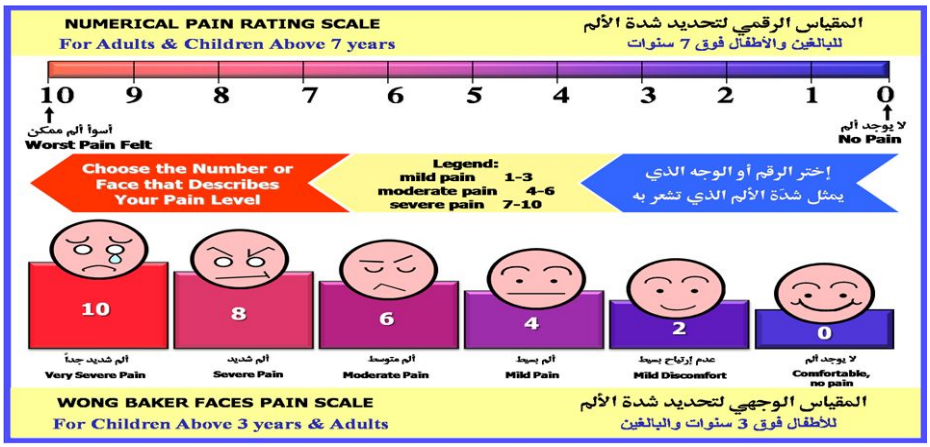
Pain assessment: for someone who's in pain and sedated will he answer all of your questions? No.

1. **Ask the patient "SOCRATES"**

- Site
- Onset
- Character (Description)
- Radiation
- Aggravating and relieving factors
- Treatment Previously
- Effect
- Severity (Intensity)

Measurement tools: provide a valuable means of overcoming this problem.

Multidimentional is using a scale and physical markers ie pulse, rr, facial expression.

Color scales & Faces scales	**Children between 3-8** • Usually have a word for pain • Can articulate more detail about the presence and location of pain; less able to comment on quality or intensity  
-Visual analogue scale **-Descriptive intensity scale** **-Numerical intensity scale** (mostly)	**Children older than 8 and Adults** • Use the standard visual analog scale  0-3 mild 4-6 moderate >6 severe Now in researches the use numerical intensity scale.
The WONG BAKER FACES SCALE. 0-No pain 10-Severe pain. User friendly. Easy to explain to patient. Compact to carry Could be used as three scales because it combines •Facial expression. •Numbers. •Words.	Ask patient to point to the faces that matches their feeling. When there's language barrier and children The number used to record the score. 
FLACC scale	You don't need to know it

Acute Pain management

- Pain management continues to be a challenge to nurses.
- PCA (patient-controlled analgesia) & epidural analgesia are advance in analgesia that may assist nurse with this challenge. which medication is used for Postoperative pain? Opioids.
- Pain management can be evaluated in terms of its ability to meet 2 main goals:
  - –To relieve postoperative pain.
  - –To relieve patient of inhibition of respiratory movement without sedation.
    Most important complication is respiratory depression.

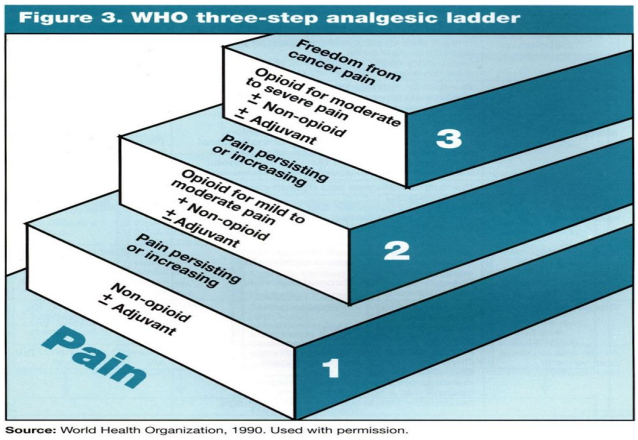
Pharmacology of Pain Management

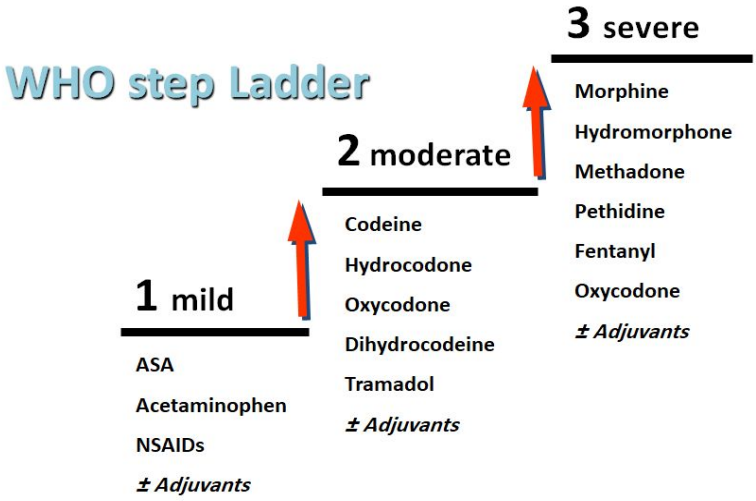
There are many different techniques,non-pharmacological & pharmacological , both **regional** and **non-regional** to provide post op analgesia.

1. **Non-pharmacological:** most of it is used in **Chronic pain.**

-Hydrotherapy
-Intradermal water blocks
-Movement & Positioning
-Touch and massage
- Acupuncture
-Aromatherapy
-Heat and cold
-Audioanalgesia
-Transcutaneous electrical nerve stimulation (TENS)

2. **Pharmacological:**





- NON OPIOID:
  - WHO class (I)
    - **NSAADs**

Analgesic / Anti-inflam / Antipyretic / Anticoagulant
*ASA
Analgesic / Antipyretic
*Paracetamol

- **NSAIDs**

Non-selective COX inhibitors:
*Diclofenac & Ketoprofen
Selective COX-2 inhibitors
*Celecoxib & Rofecoxib

Used along with opioids in step 3 to potentiate their effect and for patients with organ failure.

- OPIOIDS
  - WHO Ladder II

Weak opioid:

1-Tramadol (Tramal : Morphine = 1 : 10)

Dose: 20 – 400 mg/d
It has a lower risk of respiratory depression (Level II).
It is an effective treatment for NP pain (Level I
Side effects: N/V

2. Codeine: (Codeine : Morphine = 1 : 10)

A very weak mu-receptor agonist
Metabolized to morphine. (In KKUH codeine + tylenol 3 (30 mg)).

  - WHO Ladder III

Strong Opioids:

1. Morphine:

Standard opioid
All route of administrations
Metabolites: + M6G & - M3G
Side effects:
Sedation,
PONV,
Respiratory Depression

2. Fentanyl: (Fentanyl : Morphine = 1:10)

Commonly used in acute pain
Rapid action & Short duration.
Forms: iv, sc, transnasal, NXL, TTS

3. Pethidene: (Pethidine : Morphine = (1:10) worst opioid

May be used postop. shivering
Side effects: Active metabolite: t1/2 . More N/V > morphine

4. Hydromorphone:

Powerful > Morphine (1 : 5)
Rapidly acting.
↓ PONV
↑ Respiratory

5-Oxycodone is opioid effective for all types of pain

- Adjuvants therapy:

–Anticonvulsant (neuromodulation)
–Antidepressants (elevate the mood > decrease pain)
–NMDA antagonists (ketamine)
–Muscle relaxants
–Clonidine
–Corticosteroids (reduce inflammation and edema)
– Local Anesthetics
–Sedatives

Gabapentin used for relieving neuropathic pain

WHO Ladder IV – Regional Anesthetic Techniques

WHO analgesic guidelines:

- **Oral** medications whenever possible
- Dose "by the clock" – but always have "as needed" medications for breakthrough pain
- Titrate the dose depends on weight and age,
- Use appropriate dosing intervals paracetamol 6 hrs, NSAID 8-12 hrs.
- Be aware of relative potencies
- **Treat side effects** Opioids side effects? Sedation / Dizziness (49-70%) Nausea / Vomiting (31-48%) ,Respiratory depression (20-41%) ,Itch / Rash (0.5-5%) ,Tolerance , Urinary retention ,Drug interactions, Constipation (30-70%) ,Dependence, Addiction ,Opioid induced pain

  .

Methods of Acute Postoperative Pain Relief:

- **Depends on IV access!** Mainly in general anesthesia patient will be NPO for 4 hours (can't take oral analgesics) after that he starts with sips of water.
- Intramuscular not used anymore
- Intravenous - Intermittent Bolus
- Intravenous - Continuous Infusion
- Patient Control Analgesia (PCA)
- Epidural analgesia
- Peripheral Blocks

Post Operative pain is a type of "Acute Pain"

-
- **Variable pain intensity and Variable response to analgesia thus PCA is used.**

Causes of Postoperative Pain:
• Surgical Trauma: - Incisional: skin & subcutaneous tissue. - Deeper: cutting, coagulation, nerve compression/traction. • Position & Activities: - Coughing, deep breathing, urinary retention. Ambulation, physiotherapy . • Others: - IV site: needle trauma, extravasation, venous irritation. - Tubes drains, NGT (Nasogastric tube), ETT (Endotracheal tube). Cast, dressing (too tight).

Infusion devices: also provide a more constant level of analgesics drugs

1. Patient Control Analgesia (PCA):

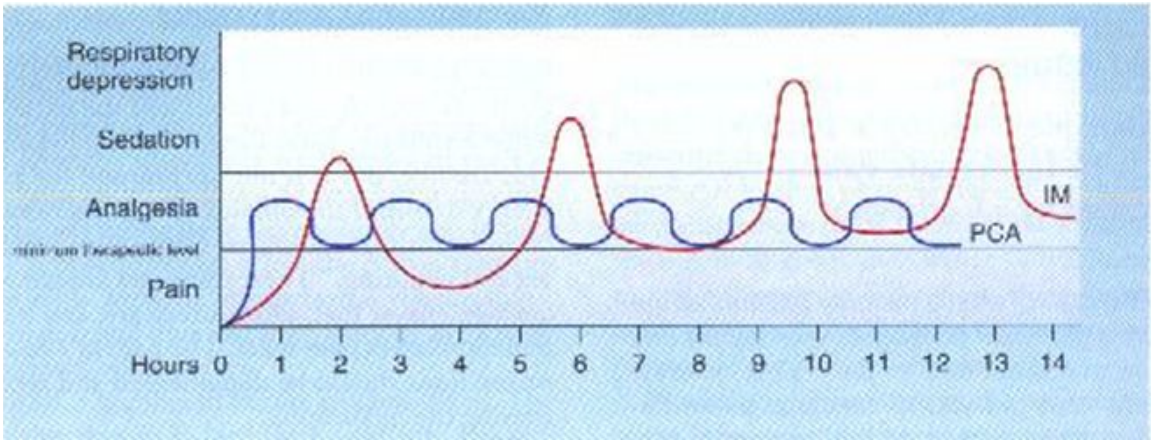
PCA are modified infusion pumps that allow patient to **self administer** a small dose of **opioid** (usually morphine) when pain is present 1mg per press. , thus allowing patients to titrate their level of analgesia against the amount of pain they are experiencing.

Table 13.2 Typical patient-controlled analgesia (PCA) settings

Drug	Morphine
Bolus	1 mg
Lockout time	5 minutes
4-Hour limit	20 mg
Background	Nil

- 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.
- Patient should not be denied access to this modality simply because of age. The same patient selection guidelines and consideration for the use of PCA apply to children.
- Screen for cognitive and physical ability to manage their pain by using the PCA. e.g. a patient who lost all fingers is not a candidate for PCA.
  - Should have the understanding of pain relief , using the demand button and when to use the demand button.
  - PCA not offered to confused patient, and those who become confused should have PCA discontinued.
- Important to remind parents and caregivers **not to** press the demand button.
- **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.
  - For someone who's taking panadol orally it'll take an hour to work, IM injection 20-30 mins to work, IV it'll take seconds to work!
- Patient can secure an early therapeutic serum level with **loading doses** titrated to individual pain needs.
- A steady state plasma level occurs because the elimination of the drug from the plasma is balanced by the patients self administered drug injection.

- **IM vs. IV PCA:** Relationship of mode of delivery of analgesia to serum analgesic level

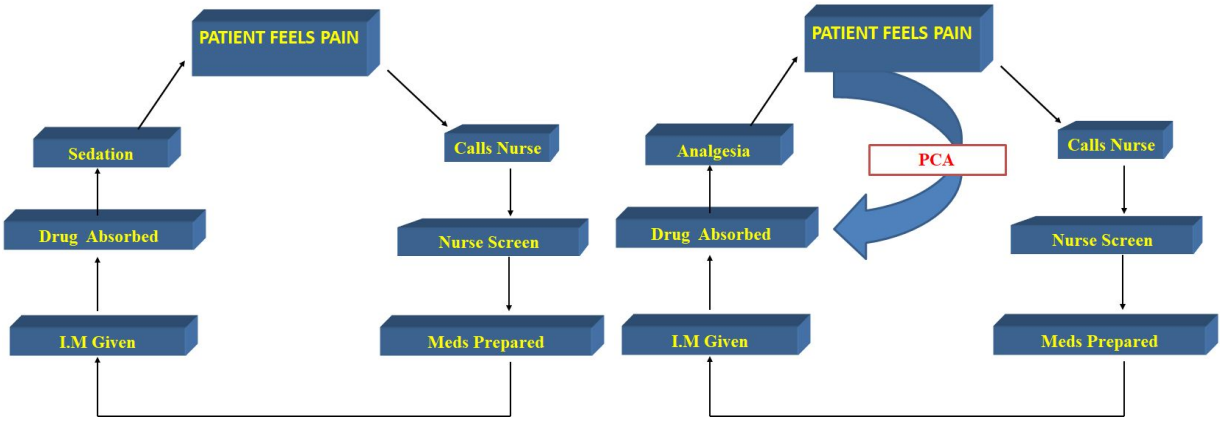


IM injections after 4 hours he'll have pain and there is amount of medication in his system, you'll give him again therapeutic dose leading to **accumulation of medication!**
  - What's the main adverse effect of pethidine? Leads to seizures!

- PCA also eliminates the lag time between pain sensation and administration of analgesia.
- The pump documents:
  1. The total number of mg of drug delivered,
  2. The number of times the patient requests a bolus and
  3. 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 (pic below)
- Increased patient satisfaction, as PCA allows patient control over their pain.
- Used in a variety of medical and post-op surgical conditions.
- Decreased narcotic usage.
- Decreased level of sedation.
- Earlier ambulation.
- 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

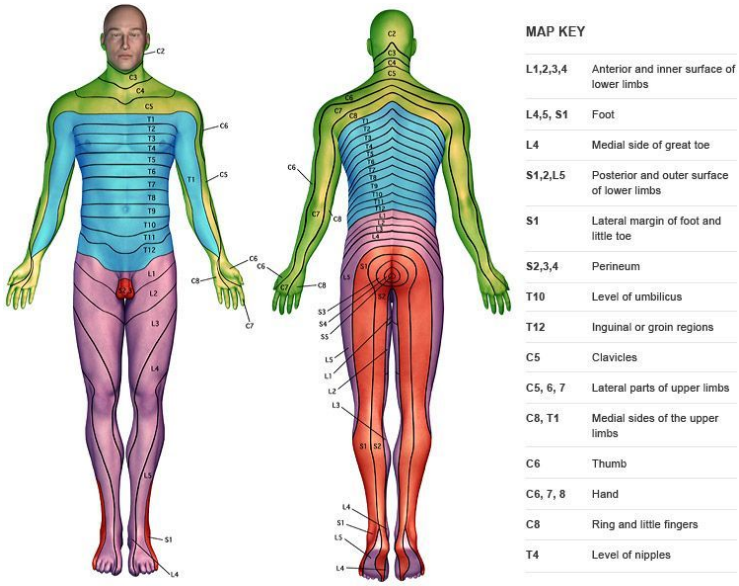


2. EPIDURAL ANALGESIA

➔ EPIDURAL = administration of medication into epidural space 10 times the dose of spinal.

➔ INTRATHECAL (spinal) = administration of medication into subarachnoid space

- **Benefits**:
  - Better pain control
  - Earlier ambulation
  - Improved Pulmonary Mechanics
  - Decreased incidence of DVT /PE
  - Decreased Blood loss and transfusion
  - Faster return of bowel function



MAP KEY	
L1,2,3,4	Anterior and inner surface of lower limbs
L4,5, S1	Foot
L4	Medial side of great toe
S1,2,L5	Posterior and outer surface of lower limbs
S1	Lateral margin of foot and little toe
S2,3,4	Perineum
T10	Level of umbilicus
T12	Inguinal or groin regions
C5	Clavicles
C5, 6, 7	Lateral parts of upper limbs
C8, T1	Medial sides of the upper limbs
C6	Thumb
C6, 7, 8	Hand
C8	Ring and little fingers
T4	Level of nipples

★ OVERVIEW OF THE SPINAL ANATOMY:

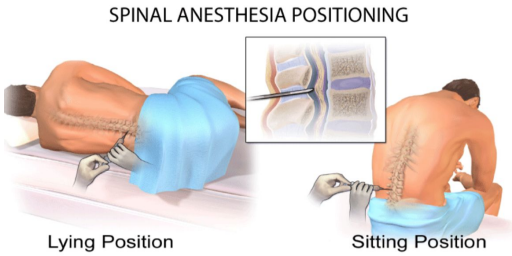
- **Spinal cord:**
  - Located and protected within vertebral column
  - Extends from the foramen magnum to lower border of L1 (adult) S2 (kids)
  - SC taper to a fibrous band (conus medullaris)
  - Nerve root continue beyond the conus (cauda equina)
  - Surrounded by the meninges (dura, arachnoid & pia mater.)

- **Epidural space:**
  - Potential space
  - Between the dura mater and ligamentum flavum What's the anatomy until you reach epidural space? Skin -> subcutaneous fat -> supraspinous ligament -> interspinous ligament -> ligamentum flavum -> epidural.
  - Made up of **vasculature**, **nerves**, **fat** and **lymphatic**

- Extends from foramen magnum to the sacrococcygeal ligament

Indications	Contraindications
The objective of epidural analgesia is to relieve pain. - Major surgery (Abdominal surgery, Pelvic surgery, Lower limb surgery) - Trauma (# ribs), - Palliative care (intractable pain), - Labour and Delivery. - Postoperative analgesia.	• **Absolute:** - Patient refusal, - Infection/abscess near the proposed injection site, - Coagulation disorder, - Spinal deformity/increased ICP, - Sepsis, - Known allergy to opioid or local anesthetic • **Relative:** - Hypotension / hypovolemia - Anticoagulant Any neurologic disease! Document everything if he has weakness document it and then you can do the surgery إثبات لأنفسكم أن الشلل من قبل مو منكم!

★ INSERTION OF EPIDURAL CATHETER



1. **Positioning of patient**:

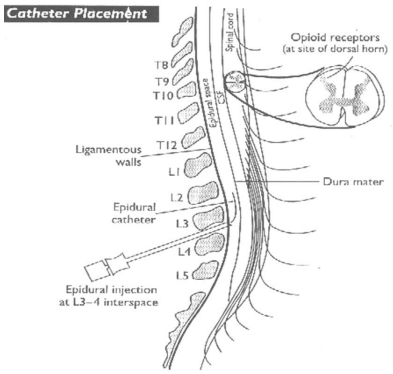
Patient assume a sitting or side-lying position with the back arched toward the physician.

- This helps to spread the vertebrae apart

2. **The site is dependent upon the area of pain**.

Height of sensory block: **Lumbar-T4, Thoracic-T2**

3. **Fixing the catheter:**



Incision	Level:
Thoracic	T4-T6
Upper abdo	T6-T8
Lower abdo	T8-T10
Pelvic	T8-T10
Lower extremity	L1-L4

★ Guidelines:

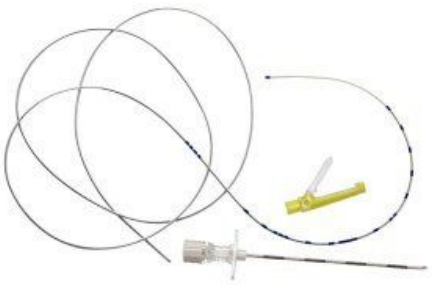
Collect items > Assess patient > Inspect site > Wash hands > **Aspiration test – Glucose test** > Administer > Document > Evaluate the outcome

★ 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:

Catheter migration into a blood vessel in the epidural space or subarachnoid space	Catheter migration out of the epidural space
• Rapid onset LOC • Decrease/loss of sensory or motor loss (marcain) • Toxicity (LAST) • Profound hypotension	• ineffective analgesia • no analgesia • drugs deposited into soft tissue.

★ COMMONLY USED MEDICATIONS:

- **OPIOIDS:**
  - **Fentanyl + Morphine:** affect the pain transmission at the opioid receptors.

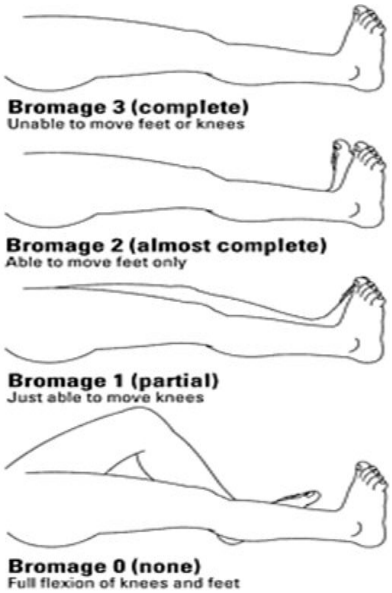
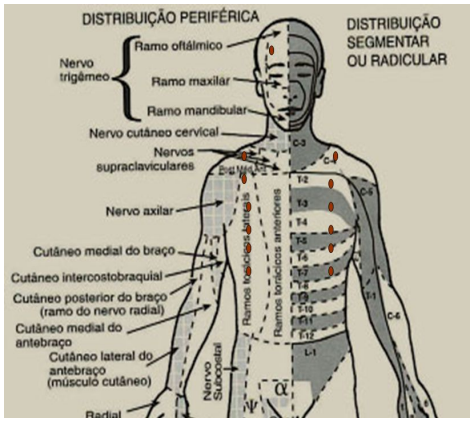
- **Local Anesthesia (L.A.):**
  - **Bupivacaine** (marcaine): inhibits the pain impulse transmission in the nerves with which it comes in contact

★ 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.

★ ASSESSMENT OF THE BLOCK:

Motor Assessment	Sensory assessment:
• Bromage Score  	• Use **ice** in the tip of a glove • Start in **upper neck** and move **down** the **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**

Complication	Management
Hypotension	• Assess intravascular volume status • No trendelenburg positioning • Teach patient to move slowly from a lying position to sitting to standing position. • **Treatment: fluids**
Temporary lower-extremity motor or sensory deficits.	**Lower the rate or concentration**.
Urine retention	**Catheterization** / Narcan low dose
Local anesthetic toxicity[8] (neurotoxicity): As a result of membrane stabilization of other excitable tissues (e.g. CNS, heart).	**Stop infusion**
Resp. insufficiency	- **Stop infusion** - ABC (100% o2 & call for help) - Assess spread and height of block - Alter analgesia - IV Narcan
Headache (dural puncture) PDPH	**Symptomatic treatment, Autologous blood patch**
Infection	
N/v (opioids stimulate the chemoreceptor trigger zone)	Primperan (metoclopremide)
Intravenous placement of catheter	
Subdural placement of catheter	
Haematoma	

SUMMARY – Scientific Evidence

- ❖ WHO Ladder System should be followed. (Evidence III)
- ❖ Analgesia should be selected depending on the initial Pain Assessment. (III)
- ❖ If the disease is not controlled on a given step Move directly to the Next Step. (III)
- ❖ For continuous pain:
  Analgesics should be prescribed on a Regular Basis.

[8] Features include circumoral tingling, feeling of impending doom, dysrhythmias, CVS collapse, loss of consciousness, convulsions and cardiac arrest.

- Only one strong opioid should be ordered at a given time.

These MCQs are from the slides:

1.At what time frame following the postsurgical period does persistent postsurgical pain become defined as being "chronic pain"?

A. 1 to 2 weeks
B. 3 to 4 weeks
C. 1 to 2 months
D. 6 to 12 months

1.C
Persistent postsurgical pain is defined as chronic pain that continues beyond the usual recovery period of 1 to 2 months following surgery (well past the normal convalescence period expected for a particular surgical procedure). Chronic pain is defined as pain that has lasted longer than 3 to 6 months, though some other investigators have placed the transition from acute to chronic pain at 12 months.

2.Regarding the treatment of neuropathic pain, the correct statement is

A. Narcotics is the most effective and "first-line" treatment option
B. It is most optimally treated with multimodal therapies
C. Sympathetic blockade will eliminate all neuropathic pain
D. Spinal cord stimulator is not an effective therapy

2.B

3.End results of the surgical stress response include all of the following EXCEPT:

A. Hyperglycemia
B. Poor wound healing
C. Positive nitrogen balance
D. Impaired immunocompetence

3. C

4. The circulating levels of which of the following hormones is not increased postoperatively:

A. Insulin
B. Glucagon
C. Antidiuretic hormone
D. Growth hormone
E. Cortisol

4. A

5.Which of the following is the EARLIEST sign of lidocaine toxicity from a high blood level?
A. Shivering
B. Nystagmus
C. Lightheadedness and dizziness
D. Tonic-clonic seizures
5.C

6.Which of the following concentrations of epinephrine corresponds to a 1:200,000 mixture?
A. 0.5 μg/mL
B. 5 μg/mL
C. 50 μg/mL
D. 0.5 mg/mL

6.B
1:200,000 means 1 g/200,000 mL = 1000 mg/200,000 mL = 1 mg/200 mL
1 mg/200 mL = 1000 μg/200 mL = 10 μg/2 mL = 5 μg/mL

7.The "snap" felt just before entering the epidural space represents passage through which ligament?
A. Posterior longitudinal ligament
B. Ligamentum flavum
C. Supraspinous ligament
D. Interspinous ligament
7.B

Q-bank:
Q1:What is the WHO guideline for post-operative analgesia?
A-Oral medications
B-Transdermal medication
C-Prescribe analgesia PRN
D-Start with higher dose of analgesia

Answer: A

Q2:A 65 year old male is suffering from acute postoperative pain after right total knee replacement. Which one of the following is the most appropriate pain assessment tool for this patient?
A-Visual analogue scale
B-Numerical rating scale
C-Facial expression scale
D-Brief pain inventory scale

Answer: B