ACUTE PAIN

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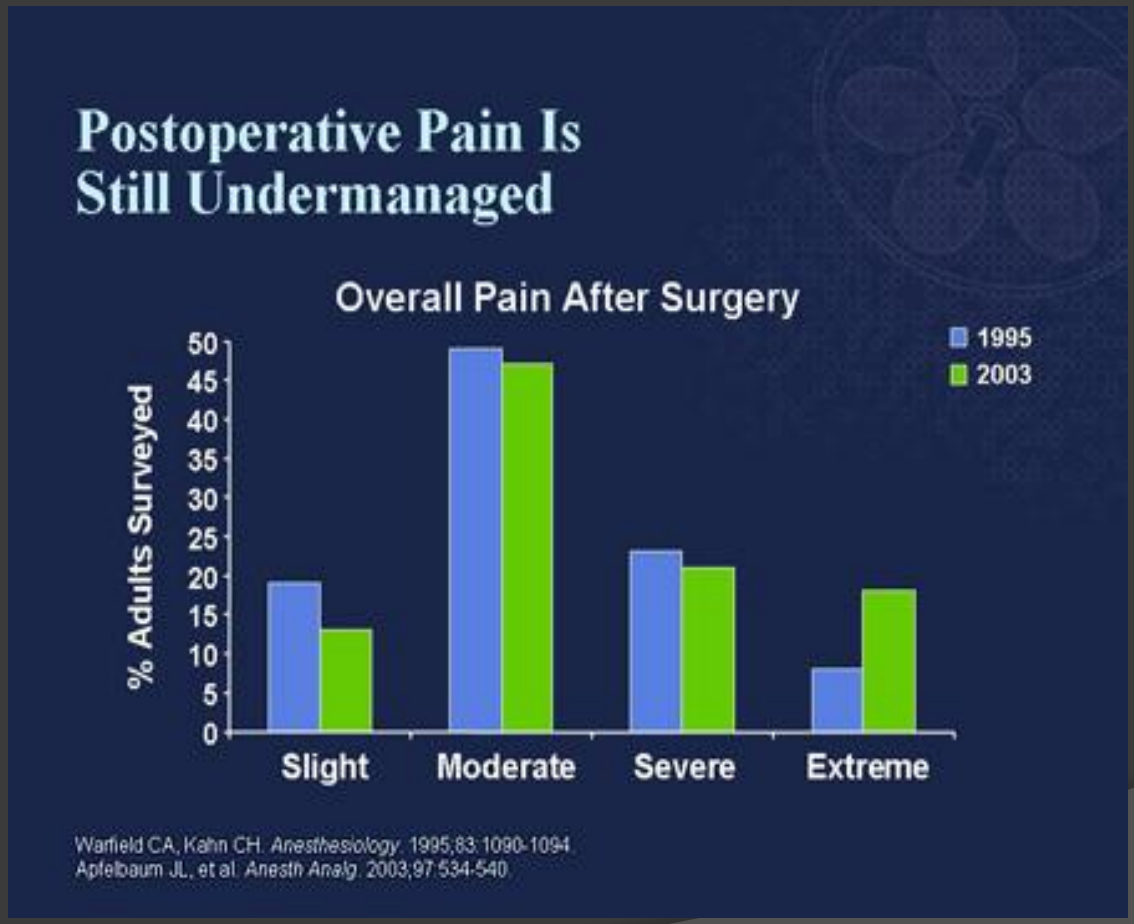
Are Patients in Pain?



Case History

- 50 year old man has gangrene of the right foot.
- Awaiting below knee amputation.
- How would you manage the pain in the pre/intra/post op period?

Objectives

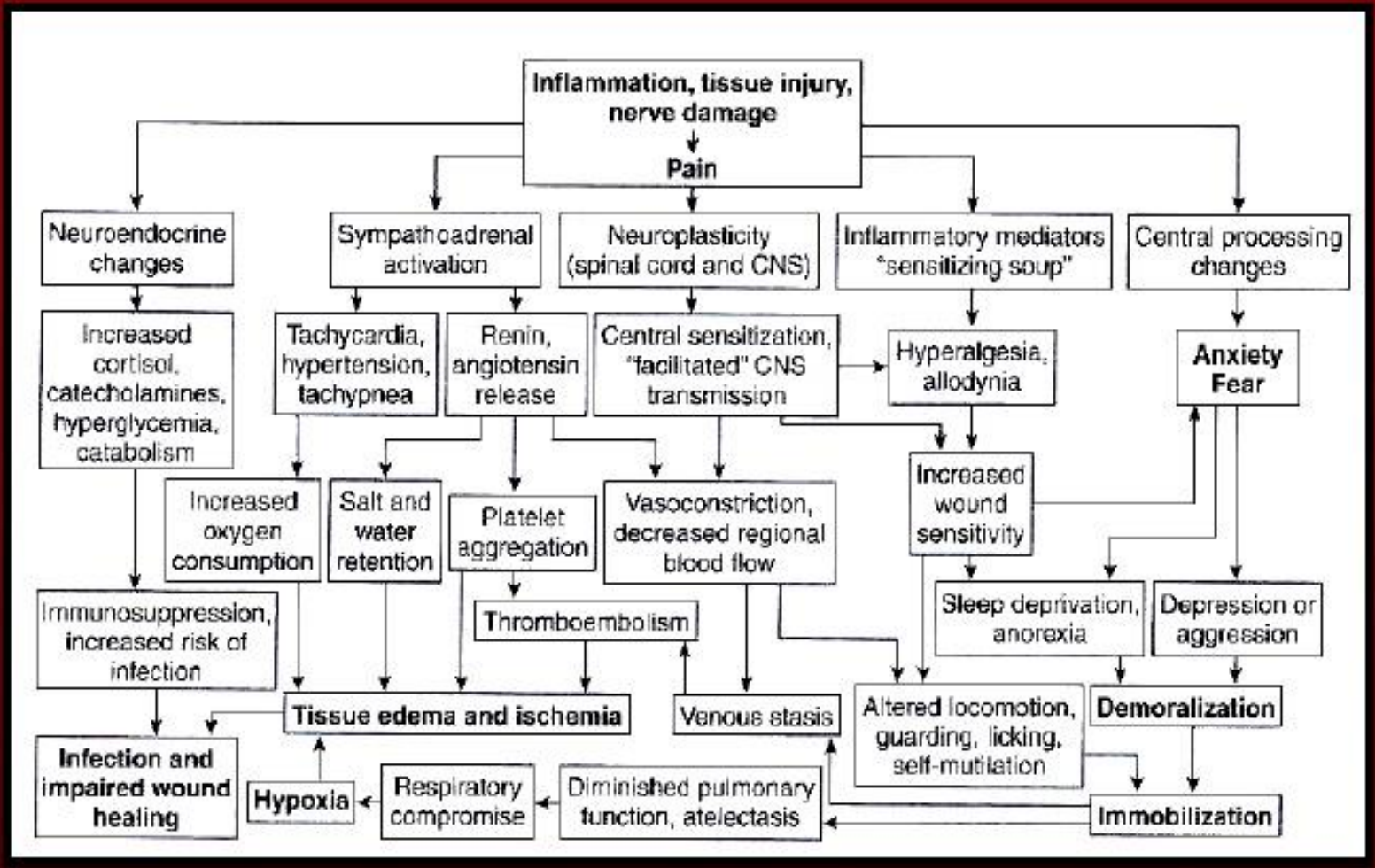
To understand;

- Why pain needs to be controlled?
- Pathophysiology of acute pain
- Assessment of pain
- Planning an analgesic regime
- Monitoring for adverse effects

Why Control Pain?

- Alleviate human suffering
- Effects on all organ systems
  - Cardiovascular
  - Respiratory
  - Gastrointestinal
  - Diabetes
  - Stress/ Mood
  - CNS, coagulation, immunity…….
- Facilitate breathing, mobility, human interaction, activities of daily living

Consequences of pain

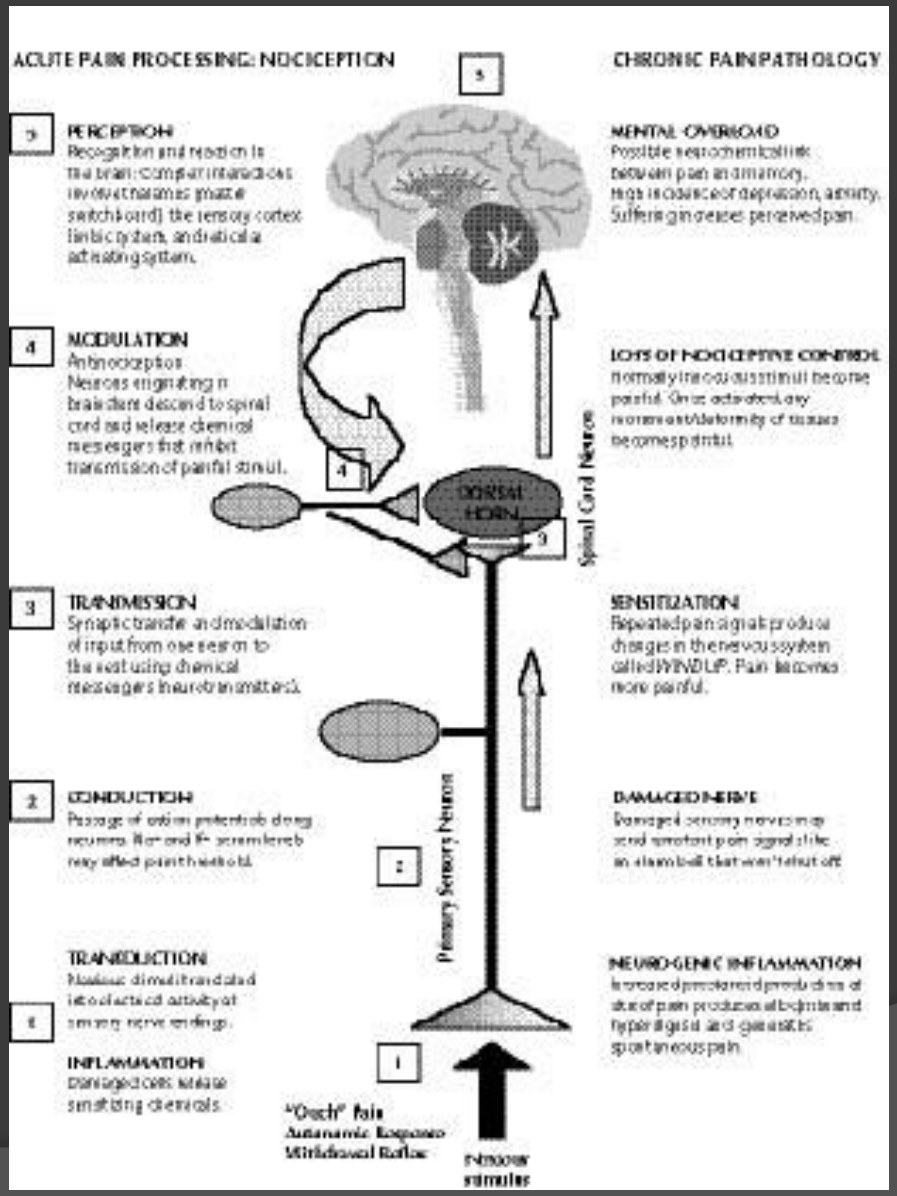


Pathophysiology of Pain

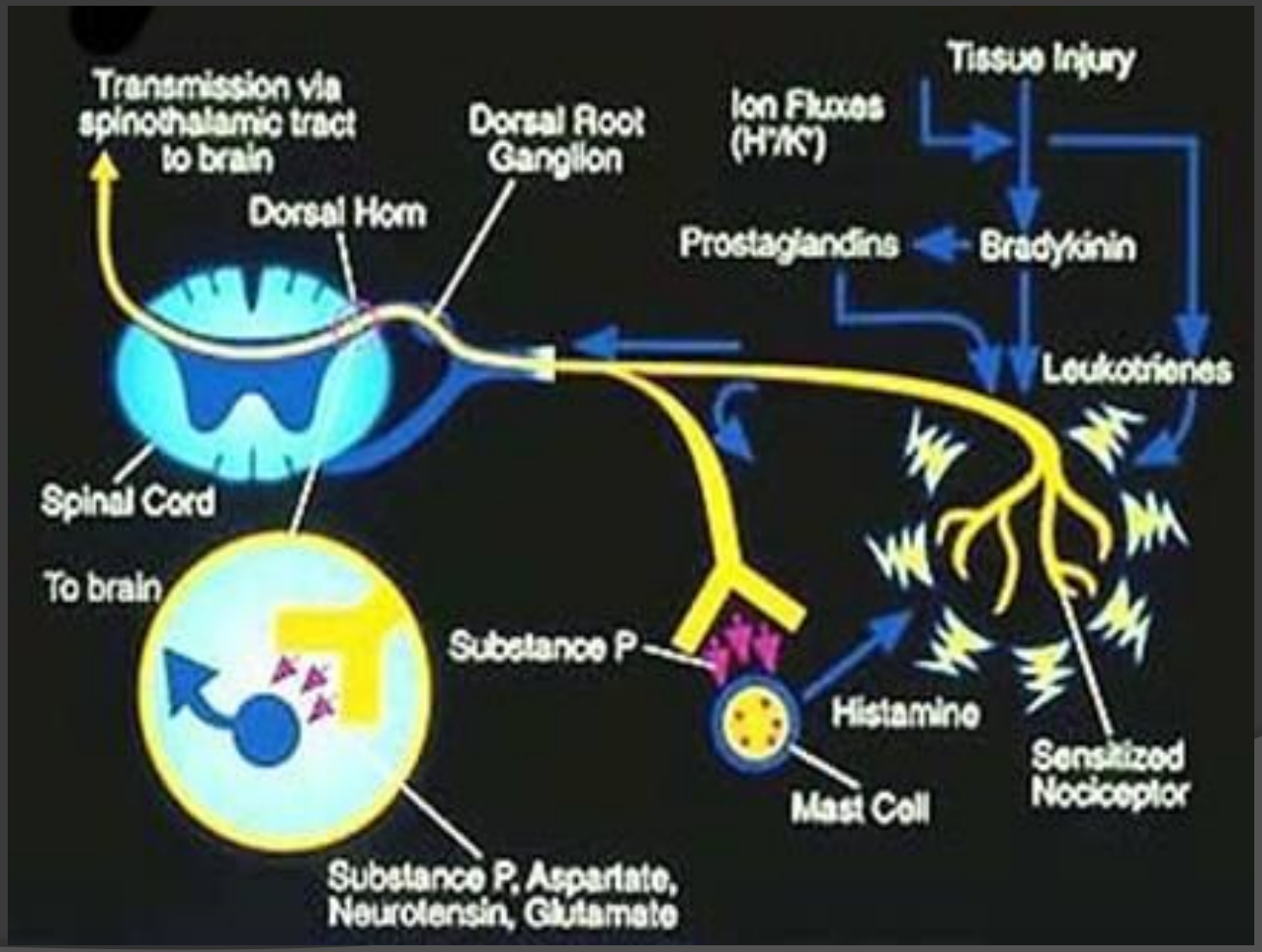
- ‘ Pain is,
  An **Unpleasant**
  Sensory & **Emotional** experience
  Associated with **actual** or **potential tissue damage** or
  described in terms of such’ - *International Association for the Study of Pain*

- Wide variation in perception –within & between individuals

Pathophysiology of Pain



Pathophysiology of Pain



Pain- Stimulus

- Chemical
- Thermal
- Mechanical

Pain Detection - Nociception

Free Nerve endings – throughout the body (except brain!)

Signal Formation -Transduction

- Chemical

  Inflammatory mediators

  eg. Leukotrienes
- Electrical

  Conversion to a form recognizable by nerves
- Drugs: NSAIDs, Opioids

Transmission

- Conduction through peripheral & central nervous system

- A-delta fibres
  Myelinated, fast
  Drugs: Local anaesthetics
- C- fibres
  Non myelinated, slow conduction
  Drugs: Antiepileptics eg.Phenytoin

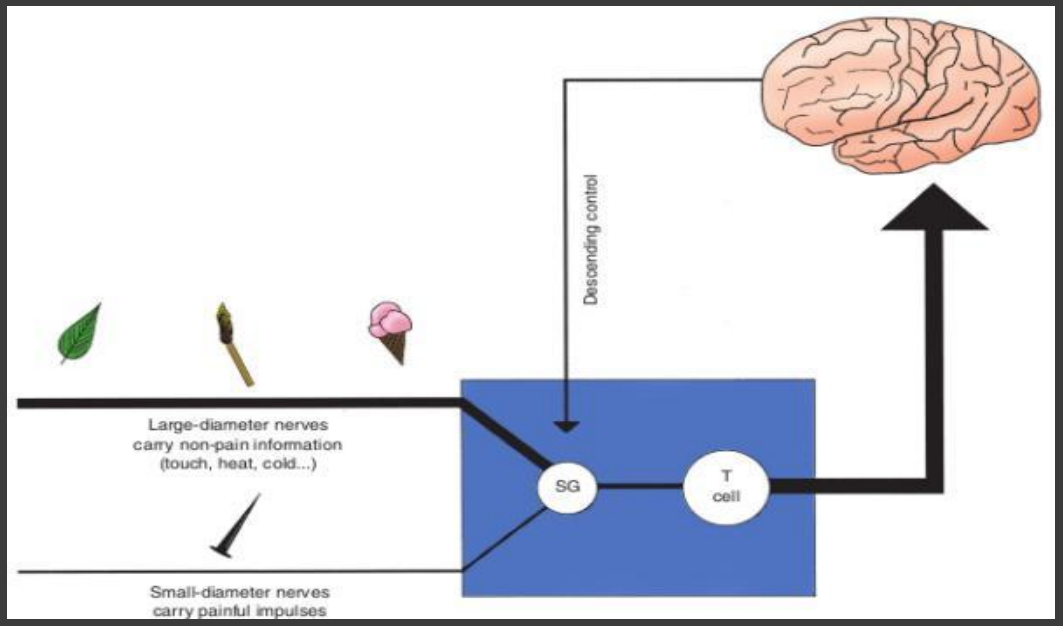
Release of Opioid in Inflammed Tissue

- β-endorphin & endomorphins produced by leucocytes and released in injured tissue.
- Opioid peptides bind to opioid receptors on sensory neurons.
- These receptors are synthesized in dorsal root ganglia and are transported intra-axonally to peripheral nerve endings.
- Binding elicits potent exogenous or endogenous analgesia in inflamed tissue.

British Journal of Anaesthesia, Volume 101, Issue 1, 1 July 2008, Pages 40–44,

Signal Processing - Modulation

- Dorsal horn of spinal cord



- Drugs: Opioids, Alpha 2 agonists- dexmedetomidine, NMDA antagonists - Ketamine

Perception

- Receiving and Interpreting impulse
- Successful transduction, transmission, modulation
- Conscious, subjective with emotional component

- Drugs: Opioids, general anaesthetics, meditation

Types of Pain- I

- Somatic pain
  Well localized, sharp & fast pain
  A-delta fibers
  eg.Deep – tendons
  Superficial – Skin

- Visceral pain
  Poorly localized, dull pain
  C- fibres
  eg. Abdominal & thoracic organs

Types of Pain -II

- Neuropathic pain
- Damage to nerve
- Chronic pain
- Difficult to treat

Factors That Worsen Pain

- Fear
- Stress
- Anxiety

- Talking to patients & comforting them, helps to control pain
- Sedation – Masks pain, but adverse effects remain

Response to Pain

- Adaptive

  Normal response, mediated by inflammation, helps healing process

Maladaptive

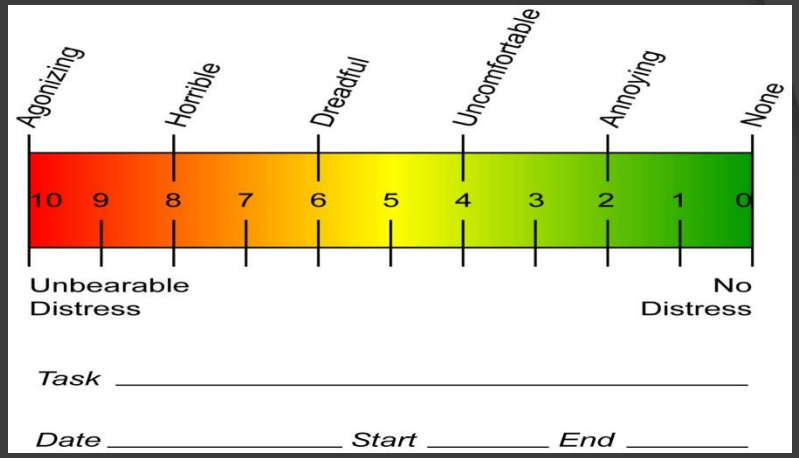
- Abnormal response
- Pain persists despite absence of stimulus
- Interferes with return to normal activity

Assessment of Pain

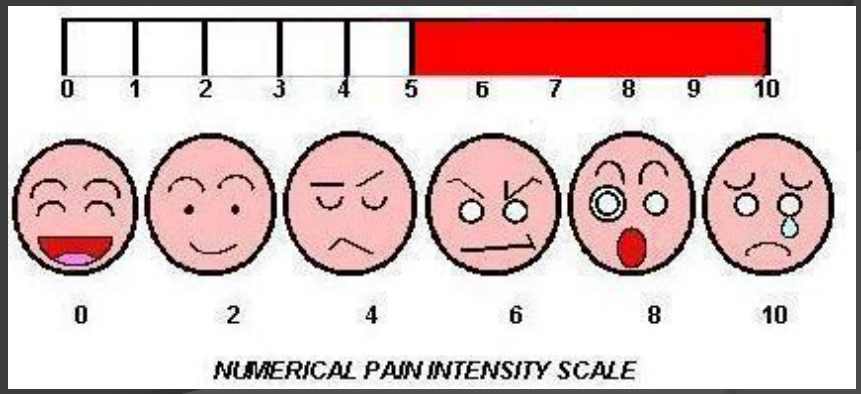
- Wide variation in expression/response to pain
- Expression may be affected by age, intelligence, level of conciousness, other factors
- Perception of pain varies among medical practitioners
- Universally accepted pain ratings

Tools for Assessment of Pain

- Visual analogue scale
- Pain score



- Smiley faces



Planning an Analgesic Regime

- Anticipate pain
- Estimate pain
- Balanced Analgesia: Multi-modal approach
- Individualize treatment according to
  - Patient perception
  - Severity of pain
  - Co-morbidity
  - Tolerance of drugs/ allergies
  - Availability

Anticipation

- Empathy
- Gangrenous foot – Severe pain unless neuropathic
- Risk of chronic pain post- ampuation
- Affects sleep, feeding, control of diabetes, hypertension, IHD

Estimate Pain

- Communicate with patients
- Tell the patients relief available
- Use assessment tools
- Communicate with the rest of the team

The Pain Team = The A team

- Patient
- Anaesthetist –

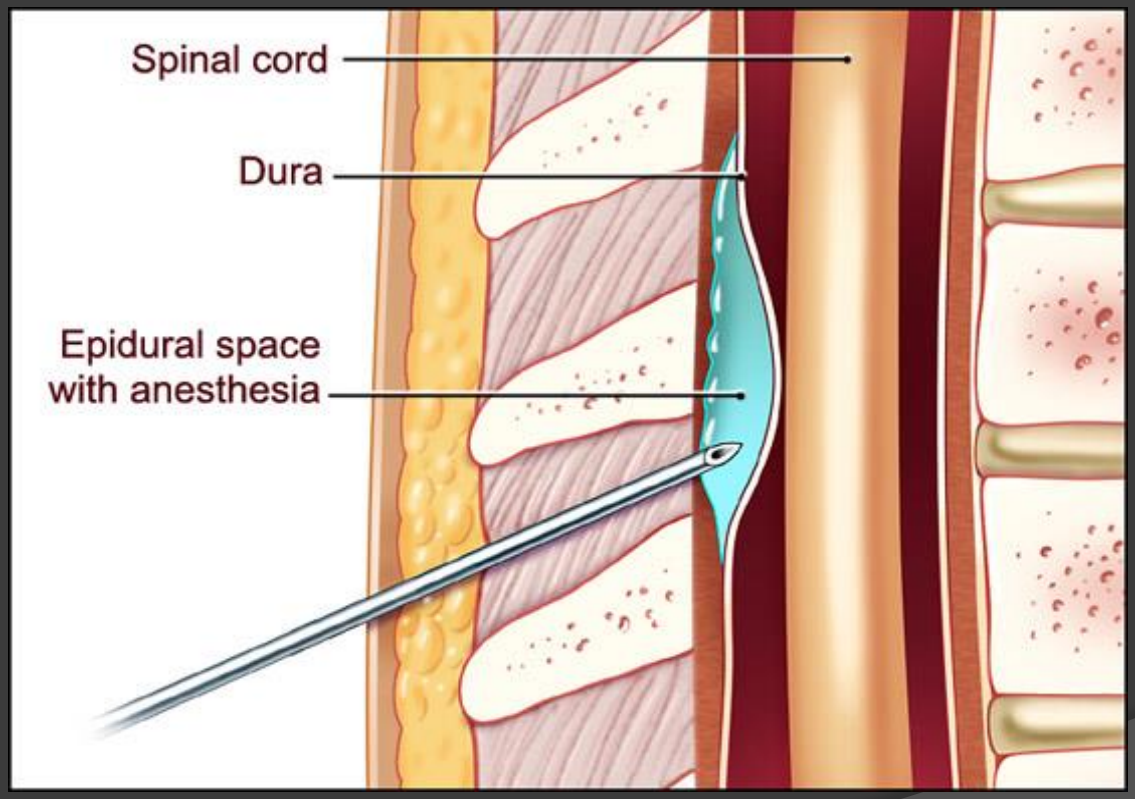
  ‘*The pretty one”*
- Surgeon
- House officers
- Nurses
- Pharmacist

Multimodal Approach to Pain Relief

- Acute severe pain – immediate, effective control

  Eg. Intravenous opioids, neuraxial block (spinal/ epidural), regional local anaesthesia
- Combinations of drugs/ route
  - Block conduction at different points
  - Reduce dose related side effects
  - Route – iv, im, sc, oral, PR, transdermal, neuraxial, inhalation

Neuraxial Analgesia



Patient Controlled Analgesia

- Autonomy
- Probably more effective than nurse controlled analgesia

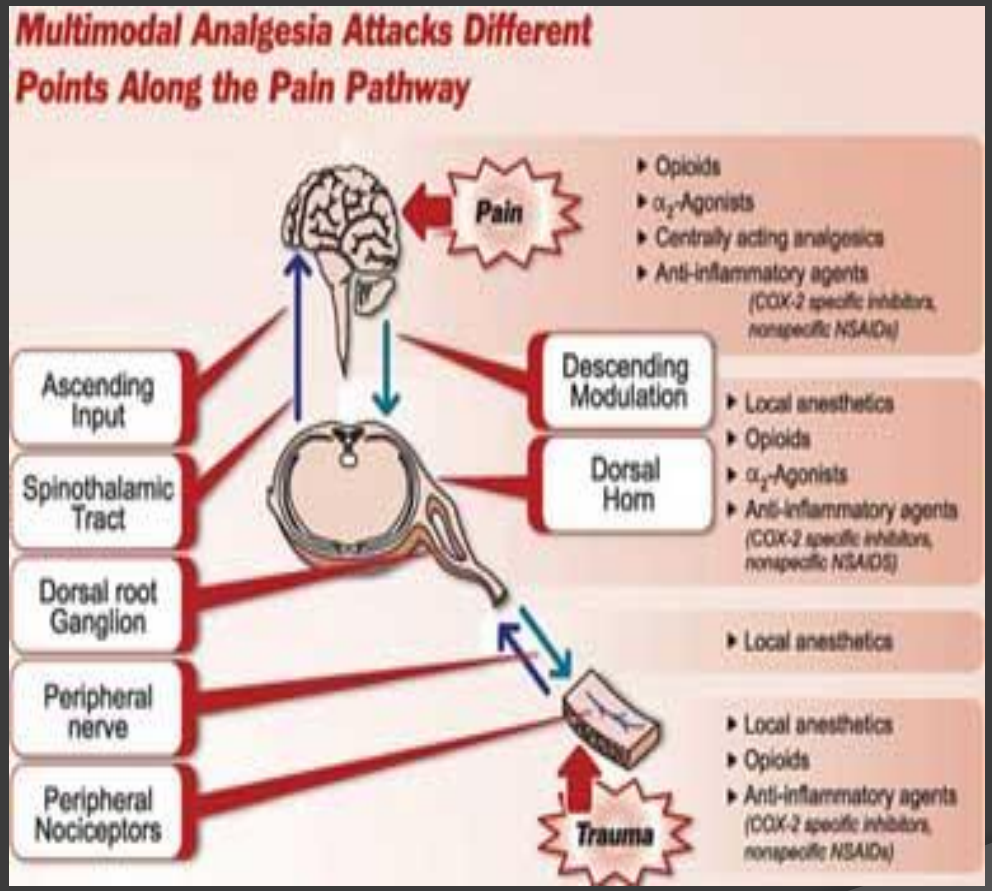
Analgesic Administration

Entonox

Transdermal
Fentanyl Patch

Subcutaneous
morphine

Pharmacological Interventions to Control Pain



Individualize Treatment

- Consider patients perception of severity
- Believe the patient!
- Control of acute severe pain – Priority
- Comorbidity eg. Coagulopathy- avoid NSAIDs/ intramuscular injections
- Allergies/ intolerance to drugs
- Availability of– Drugs/ equipment/ skills/ staffing

Case History

- Anticipated severity of pain- Intensely severe
- Estimate of severity – Mild
  Moderate
  Severe

- Multimodal – IV opioid/ neuraxial –
  spinal/epidural
  PCA
  +/- NSAIDs
  +/- Paracetamol
  + Surgery

Monitoring

- Opioids – Respiratory depression – Monitor respiratory rate, level of sedation

  Nausea/ vomiting
- Neuraxial local anaesthetics – Hypotension, urinary retention, pruritus, limb weakness, LA toxicity
- NSAIDs – Renal function, gastric irritation, bronchospasm, platelet dysfunction
- Tramadol - Nausea/ vomiting,

Summary

- Pain is real!
- Wide variation in perception & response to pain
- Pain affects function of all organ systems
- Pain control improves well being & reduces harmful effects
- Assess severity & response to analgesics
- Acute pain – aggressive treatment
- Multimodal analgesic regime