Introduction to pain

Definition of pain	An unpleasant sensory & emotional experience associated with actual/potential tissue damage
Purpose of pain	1. As a protective mechanism
	2. Cause individual to react to remove pain stimulus

Nociceptive pain mechanism

	Wide spread in superficial layers of skin & certain internal tissues
	Excited by 3 different stimuli : mechanial, thermal, chemical
	Pain is related to degree of receptor stimulation by processes causing tissue injury (more receptor stimulated=more pain)
2 nociceptor systems	1. A delta fibres (faster)
	2. C fibres (slower)
Chemicals that stimulate nociceptors	Histamine
	Bradykinins
	5-HT (serotonin)

Nociceptive pain mechanism (cont)

	some metabolic substances released from damaged cells (lactic acid,ATP)	
Sources of nociceptive pain	Somatic pain	
	Visceral pain	Pain from internal structures, poorly localised, often radiates or referred to other areas

Neuropathic pain

Pain resulting from pathophysiologic changes in peripheral or CNS
A state of chronic pain is sustained

Idiopathic pain

Patient's psychological state contribute to pain	May be due to anzxiety,depression, other psychological disorders

Pharmacotherapy in management of pain

1. Opioid analegesics
2. NSAIDs
3. Local anaesthetics
4. Alpha 2 agonists

Opioids

MOA	Binds to opioid receptors and inhibit action on neurons

Opioids (cont)

Type of opioid receptors	1. Mu receptors	effects: analgesia,respiratory&physical depression,miosis,reduced GI motility
	2. Kappa receptors	effects: sedation,-miosis
	3. Delta receptors	effects: dysphoria,hallucinations

Classification of opioids

Strong agonists	Morphine
	Pethidine
	Methadone
	Fentanyl
	Sufentanil/Alfentanil
Mild to moderate agonists	Codeine
Mixed agonist-anatagonists	Pentazocine
	Buprenorphine

Strong agonist opioid's desirable effects

Analgesia	Centrally mediated
	Alters emotional perception of pain
Sedation	
Sense of well being	
Cough supression	
Reduce GI motility	Can help with diarrhoea

Strong agonist opioid's adverse effects

Respiratory depression	Dose related
	Most important side effect which limits clinical use
Miosis	Constriction of pupil
	Decreases ability to see in dim light

Strong agonist opioid's adverse effects (cont)

Orthostatic hypotension	
Nausea & vomiting	
Constipation	
Anorexia	
Sedation	
Development of dependence	Cause addiction

Caution:
*Eldery are more prone to adverse effects of narcotic analgescis, thus lower dose is required

Tolerance of strong agonist opioids

Due to regular/intermittent use	Regular administration of fixed dose of drug give rise to progressively decreasing effect
	Progressively higher dose has to be administered to achieve the same effect
Develops gradually	
Cross tolerance between opioids	Will develop tolerance to drugs of similar pharmacological action

Clinical uses of strong agonists opioids

Severe pain	
Pre-medication for anaesthesia	
Methadone	Substitution therapy in drug dependence clinics
	Chronic use: long term treatment in terminal cancer patients

Mild-moderate agonists (CODEINE)

Indications	Mild-moderate pain	Usually in combination with non-opioid analgesics
	Cough supression	At lower dose than that for analgesia

Mixed agonist-antagonist opioids

Opioids with full agonist activity at one receptor subtype but behaves like an antagonist or partial agonist at another receptor subtype

Examples:	Pentazocine
	Buprenorphine
Clinical uses	Chronic severe pain
	Drug abusers

Advantages of mixed agonist-antagonist

Less adverse effects mediated by specific receptors
Less prone to cause dependence and abuse

Caution:
*Should not be given to patients that are already on treatment with pure strong agonist as it may precipate severe withdrawal syndrome

Tramadol

Chemically unrelated to other opioid drugs

MOA	Partial mu agonist	Less affinity than morphine
	Inhibition of serotonin and noradrenaline reuptake	Levels of serotonin&noradrenaline increase
	Block nociceptor impulse at spinal level	
Clinical use	Mild to moderate pain	
Adverse effects	Less constipation,less respiratory depression,less dependence than opioids	
	Dizziness,sedation,nausea,vomiting	
	Constipation,headache	

Counselling points for opioids

Drug may cause drowsiness,dizziness,blurring of vision	Do not drive or operate heavy machinery
Avoid alcohol	
If patient experience GI effects	Drug can be taken with food
Seek medical attention if	Experience severe nausea,vomiting,constipation