Analgesia *et al.*

Dr William Dooley

SIMPLY FINALS

Plan

- **Pain assessment**
- **Acute vs. Chronic pain**
- **Overdose / Toxicity**

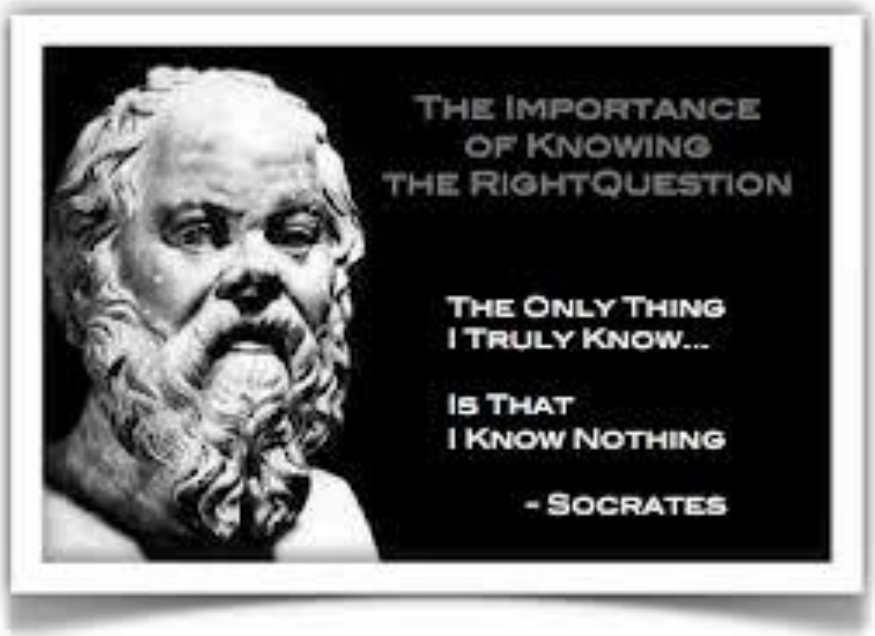
- **Some calculations**
- **Other common meds**
  - **Anti-emetics**
  - **Laxatives**

Pain assessment

The 5th Vital Sign

History, History, History

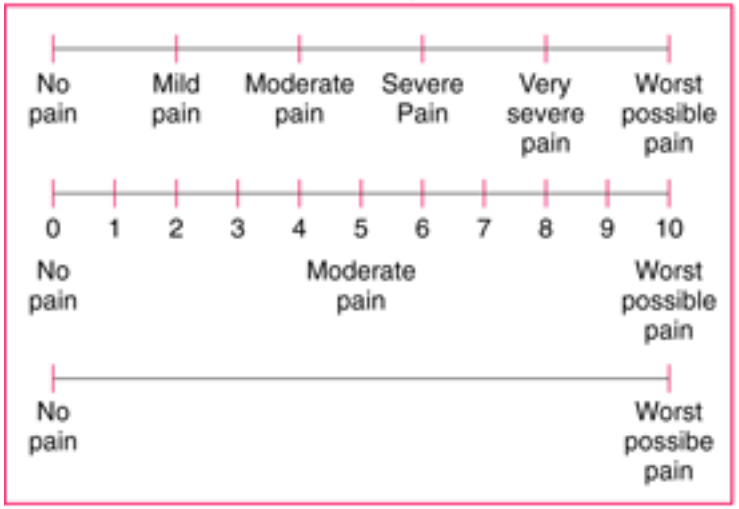
S ite
O nset
C haracter
R adiation
A ssociated symptoms
T ime
E xcaerbating/Reliveing factors
S everity

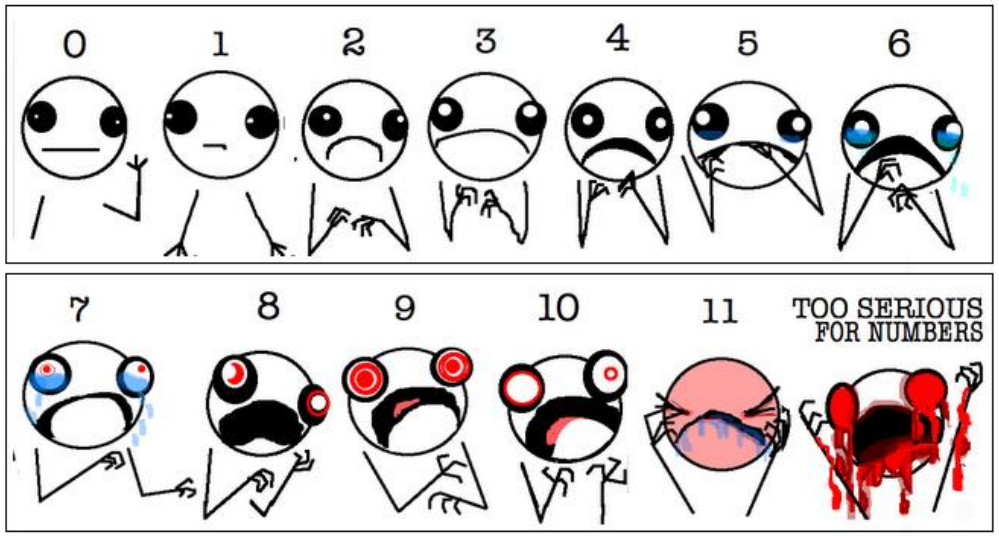


SIMPLY FINALS

Pain assessment

Visual Analog Scale





http://hyperboleandahalf.blogspot.com

Graphic Scale

Verbal Scale

"On a scale of 0 to 10, with 0 meaning no pain and 10 meaning the worst pain you can imagine, how much pain are you having now?"

Functional Pain Scale

0 = No pain
1 = Tolerable and pain does not prevent any activities
2 = Tolerable and pain prevents some activities
3 = Intolerable and pain does not prevent use of telephone, TV viewing, or reading.
4 = Intolerable and pain prevents use of telephone, TV viewing, or reading.
5 = Intolerable and pain prevents verbal communication

SIMPLY FINALS

Common Analgesia

- Paracetamol
- NSAIDs
- Weak opioids
- Strong opioids

SIMPLY FINALS

Paracetamol *(Acetominophen)*

500mg-1g QDS (Max. 4g/24hrs)
PO/PR/IV

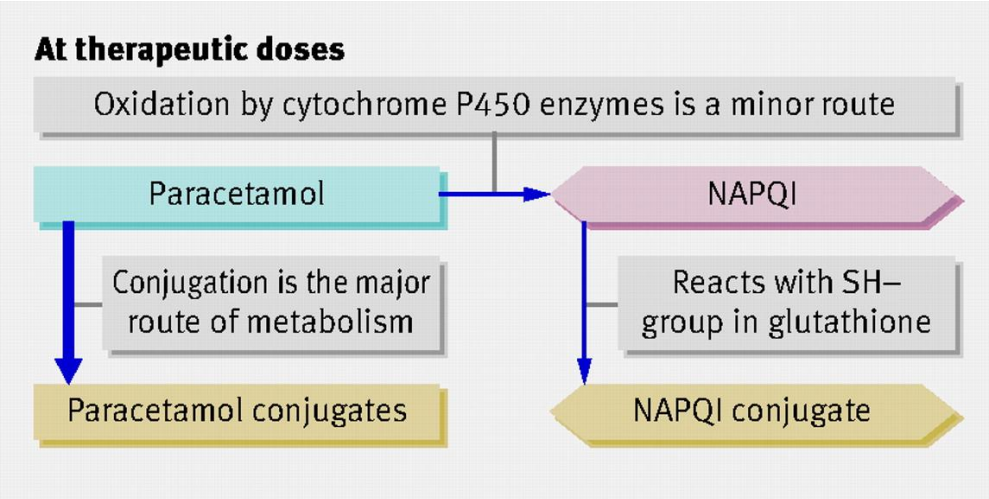
Analgesia / Anti-pyrexial

Onset of action 10-30 mins
Half life 1-4 hours

Metabolised by the liver and is hepatotoxic
Metabolites are then excreted by the kidney

MOA poorly understood ? COX inhibition

SIMPLY FINALS



Ferner R E et al. BMJ 2011;342:bmj.d2218

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Case of Overdose

44yo male

Found unconscious with multiple packets of empty medications. Lives alone, was found by visitor.

PMH- depression (previous suicide attempts), chronic ETOH abuse, malnourished.

SH- Unemployed

What are his risk factors for suicide?

What more would you ask in the history??

SIMPLY FINALS

Paracetamol Overdose

History / History / History

HPC

- Dose- ?reliable historian / mixed
- Time – once or staggered overdose
- Symptoms – nausea and vomiting → RUQ pain
- Psych- intentional / support / planned / alone / cry for help / warning / letter

PMH

- ETOH Abuse
- Previous DSH / Suicide attempts
- Chronic Liver Disease

DH

- Enzyme inducing drugs
  (e.g. Carbamazepine, phenobarbital, phenytoin, rifampicin, St John's wort etc.)

SIMPLY FINALS

Paracetamol Overdose

Examination

Low BMI / malnourished
Liver damage- jaundice / reduced GCS / asterixis / RUQ tenderness

Investigation

Serum paracetamol levels – **measured between 4-16hrs post ingestion**
LFTs (particularly transaminases)
Clotting and INR
U+E
?Urinalysis – ketones = poor nutrition

SIMPLY FINALS

Factors that increase the risk of liver injury

High chance of glutathione depletion:

- **Malnourished**
- Eating disorders (anorexia or bulimia)
- Failure to thrive or cystic fibrosis in children
- AIDS
- Cachexia
- **Chronic Alcoholism**

SIMPLY FINALS

Treatment of paracetamol OD

Activated charcoal
Decreases absorption of paracetamol
Needs to be given quickly (within 1hr)

N-acetylcysteine (NAC)
Antedote
Acts as precursor to glutathione to increase levels and reduce liver damage

Adverse effects
Nausea and vomiting
Anaphylactoid reaction which is histamine mediated

SIMPLY FINALS

NAC use

1. Do they need treatment

2. Dose of treatment

SIMPLY FINALS

Case

54yo female, PMH- depression (previous suicide attempts), chronic ETOH abuse, malnourished. Found unconscious with multiple packets of meds.

1. Do they need treatment

2. Dose of treatment

SIMPLY FINALS

Would you treat these?

1.OD 15x500mg tablets at 12:00.
Blood at 18:00.
PPC= 100mg/litre

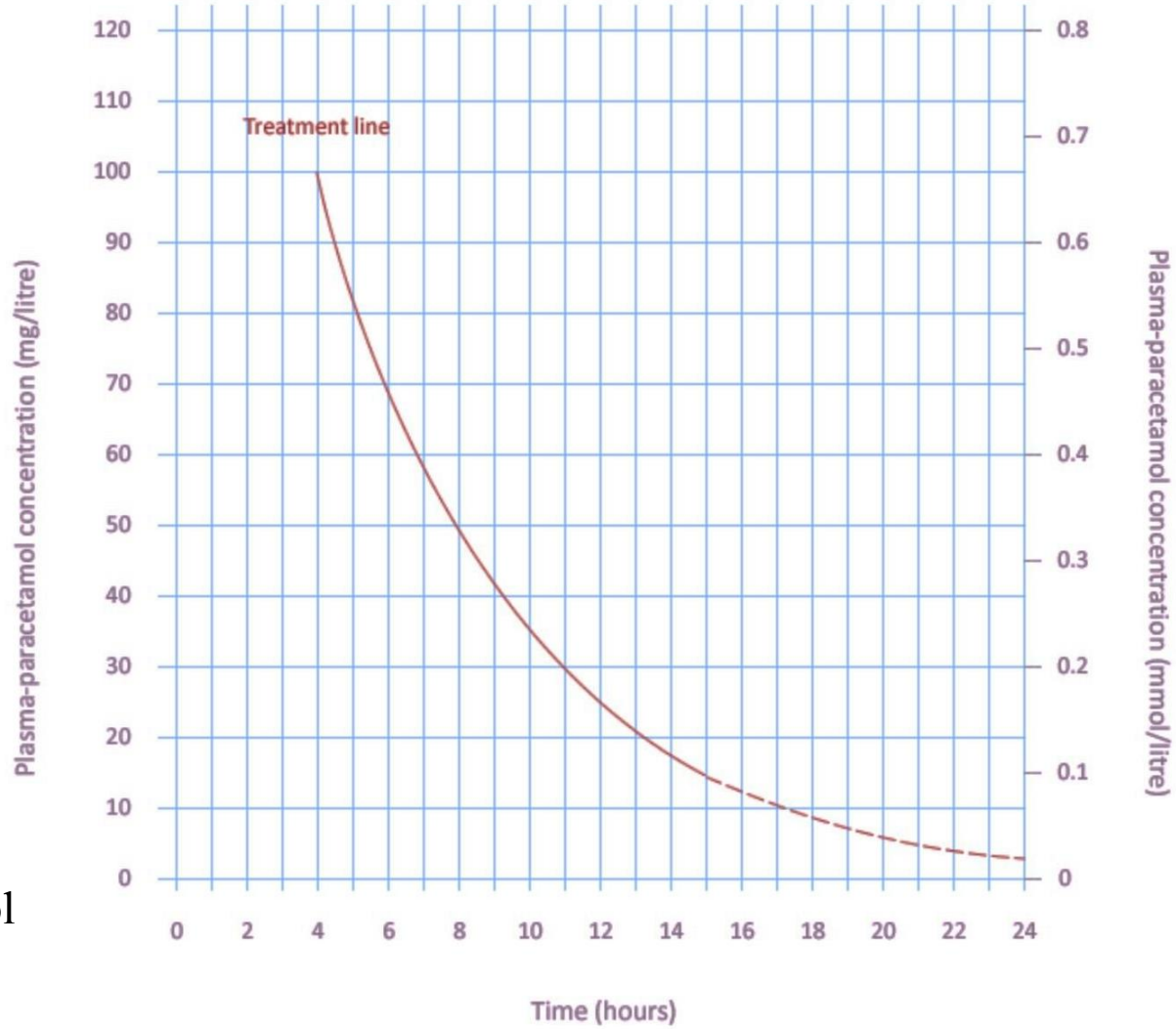
2.OD 24x 500mg tablets at
09:00. Blood at 17:00
PPC= 30mg/litre

3.OD at 20:00 ?amount. Blood
at 07:00. PPC= 30mg/litre

What would you do ?

4. Staggered OD between 0900 and 1600. Admits taking 50 Paracetamol tablets. Presents at 1630.

5. OD at 0800. Admits taking 5 tablets with ETOH XS. Presents at 1100.



SIMPLY FINALS

Would you treat these?

1.OD 15x500mg tablets at 12:00. Blood at 18:00. PPC= 100mg/litre

TREAT

2.OD 24x 500mg tablets at 09:00. Blood at 17:00. PPC= 30mg/litre

DON'T TREAT

3.OD at 20:00 ?amount. Blood at 07:00. PPC= 30mg/litre

TREAT

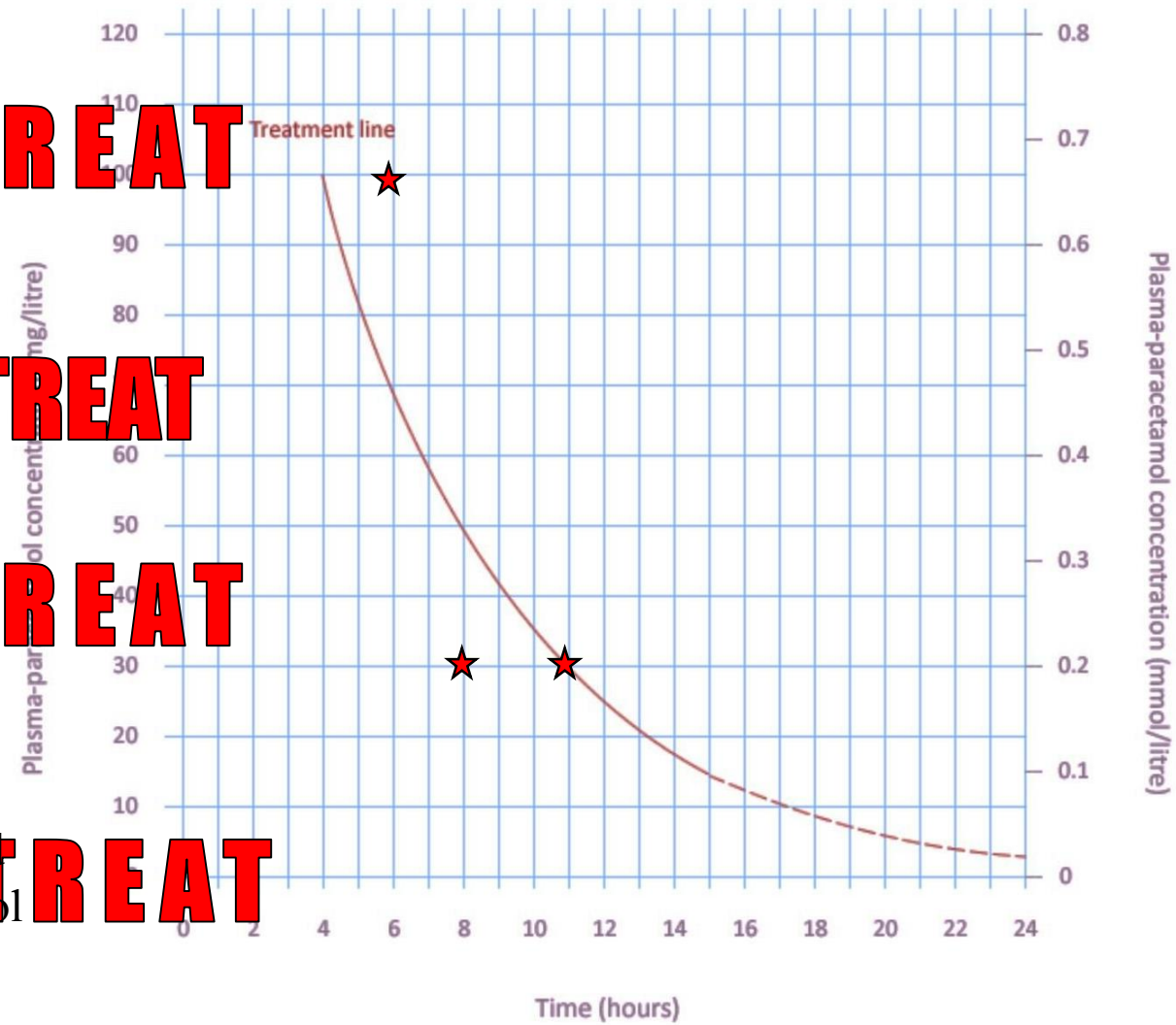
What would you do ?

4. Staggered OD between 0900 and 1600. Admits taking 50 Paracetamol tablets. Presents at 1630.

TREAT

5. OD at 0800. Admits taking 5 tablets with ETOH XS. Presents at 1100.

WAIT!



SIMPLY FINALS

Case

54yo female, PMH- depression (previous suicide attempts), chronic ETOH abuse, malnourished. Found unconscious with multiple packets of meds.

1. Do they need treatment

2. **Dose of treatment**

SIMPLY FINALS

2. Dose of treatment

Total dose (300 mg/kg in 20 hours)

150 mg/kg in 200 mL (glucose 5%) over first 0.25 hours
50 mg/kg over next 4 hours in 500 mL
100 mg/kg over next 16 hours in 1000 Ml

What dose regime would you prescribe for a 50kg patient?

1. 50x150 = 7500mg NAC in 200ml glucose 5% over 15 minutes
2. 50x50 = 2500mg NAC in 500ml glucose 5% over 240 minutes
3. 100x50 = 5000mg NAC in 1000ml glucose 5% over 960 minutes

SIMPLY FINALS

Liver Transplant

Criteria for possible transplant:

- **Metabolic Acidosis -** Arterial pH less than 7.3

- **Hepatic encephalopathy** grade III/IV and **serum creatinine** concentration >300 µmol/L and **prothrombin time** >100 seconds

- **Arterial lactate concentration** >3.5mmol/L on admission or >3.0mmol/L 24 hours after paracetamol ingestion or after fluid resuscitation

Discuss with liver transplant unit as soon as the ***possible*** need is identified

SIMPLY FINALS

Non-Steroidal Anti-Inflammatory Drugs

Drug name	Dose	Anti-inflammatory	Side effect risk
Ibuprofen	300-400mg TDS	+	+
Naproxen	500mg BD	++	++
Diclofenac	75-150mg total/day	++	++
Indometacin	50-200mg total/day	+++	+++

MOA: COX 1 and COX 2 inhibitors so inhibit prostaglandin production
Indications: inflammatory conditions e.g. inflammatory arthritidies, rheumatoid arthritis, osteoarthritis, back pain, soft tissue injury

Side Effects:
COMMON… especially in elderly
Gastric- indigestion/nausea and gastric erosions (+/- UGI Bleed).
Co-prescribe proton pump inhibitor if patient also on anti-coagulant
Bronchospasm- type 1 hypersensitivity reaction. C/I in those with asthma

Less common; fluid retention, hypertension, acute kidney injury

COX-2 inhibitors

e.g. Celecoxib / Etoricoxib

Reduce GI side effects by 50%
Expensive
?increased CV events

Contraindicated
CV Disease or cerebrovascular disease
Relatively with CV risk factors

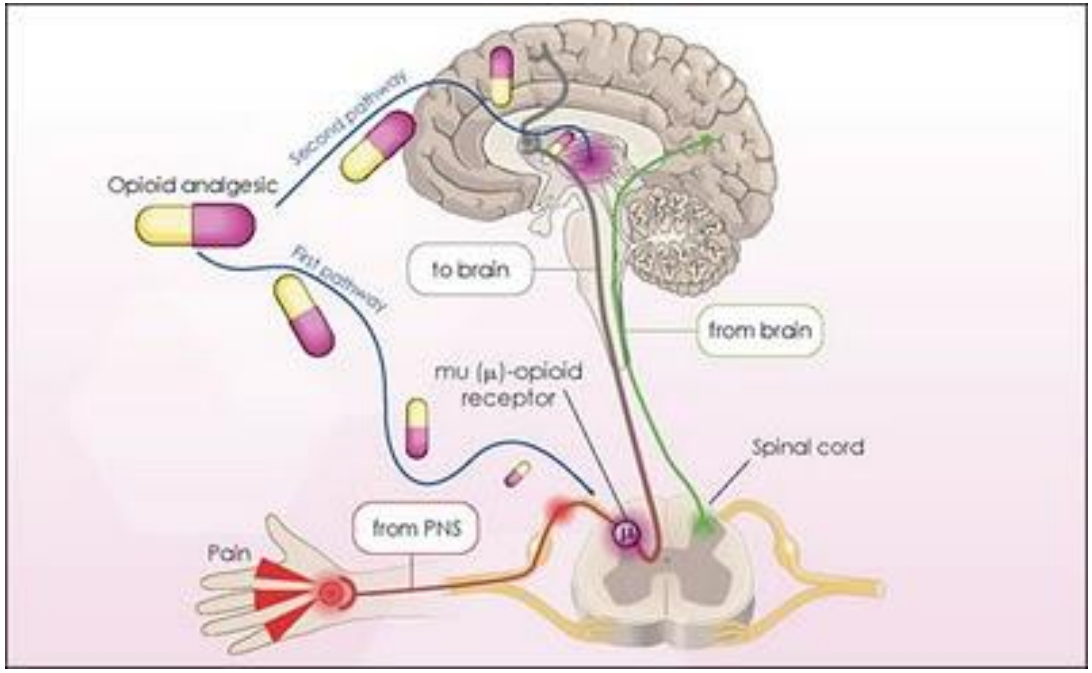
Try NSAIDs first

SIMPLY FINALS

Opioids

Mode of action

- Presynaptic inhibition of production of neurotransmitters
- Postsynaptic suppression activity in nociceptive pathway
- Increased transmission of the descending inhibition



SIMPLY FINALS

Opioids

Morphine

SC/IM/PO
10mg (max 30mg/24hours), titrate to symptoms/response

Side effects
Nausea and vomiting → usually co-prescribe antiemetic (e.g. Metoclopramide)
Constipation → usually co-prescribe laxative (e.g. lactulose PRN)
Drowsiness
Respiratory depression

Overdose
Accidental / Iatrogenic / Intentional
Reversal with **NALOXONE** 400mcg-0.2mg IV (increased by 100mcg/ 2 mins PRN)
Naloxone half life < Morphine half life (so may need multiple doses)

SIMPLY FINALS

Opioids

Codeine

30-60mg 4 hourly (max 240mg/24hrs)
Orally
Analgesia (normally used in combination with above e.g. co-codamol/co-dydramol)

Side effects
Constipation

Tramadol

50-100mg 4 hourly
Orally (rarely IV)
Opioid action + enhancement of the serotonergic and adrenergic pathways

Fewer typical opioid side effects

Fentanyl

Patches 25 / 100 ug/hr
Change every 72 hours

SIMPLY FINALS

Patient Controlled Analgesia

Allows self administration of pre-determined dose of medication e.g. morphine

Can determine:

- Dose (usually start with 1mg morphine)
- Maximum dose (over 24hours)
- Lock-out period (usually 5 mins)

SIMPLY FINALS

Palliative Symptom Control

Palliative Care;
Active & total care of incurable disease aim to improve QOL within wide MDT

Symptoms can be caused by disease or treatment
Detailed history and examination required to determine cause/best treatment options

Main symptom groups:

- **GI Symptoms**

e.g. nausea/vomiting, anorexia, constipation, bowel obstruction

- **Respiratory Symptoms**

e.g. Breathlessness, secretions

- **Pain Symptoms…**

SIMPLY FINALS

Pain Control in Palliative Care

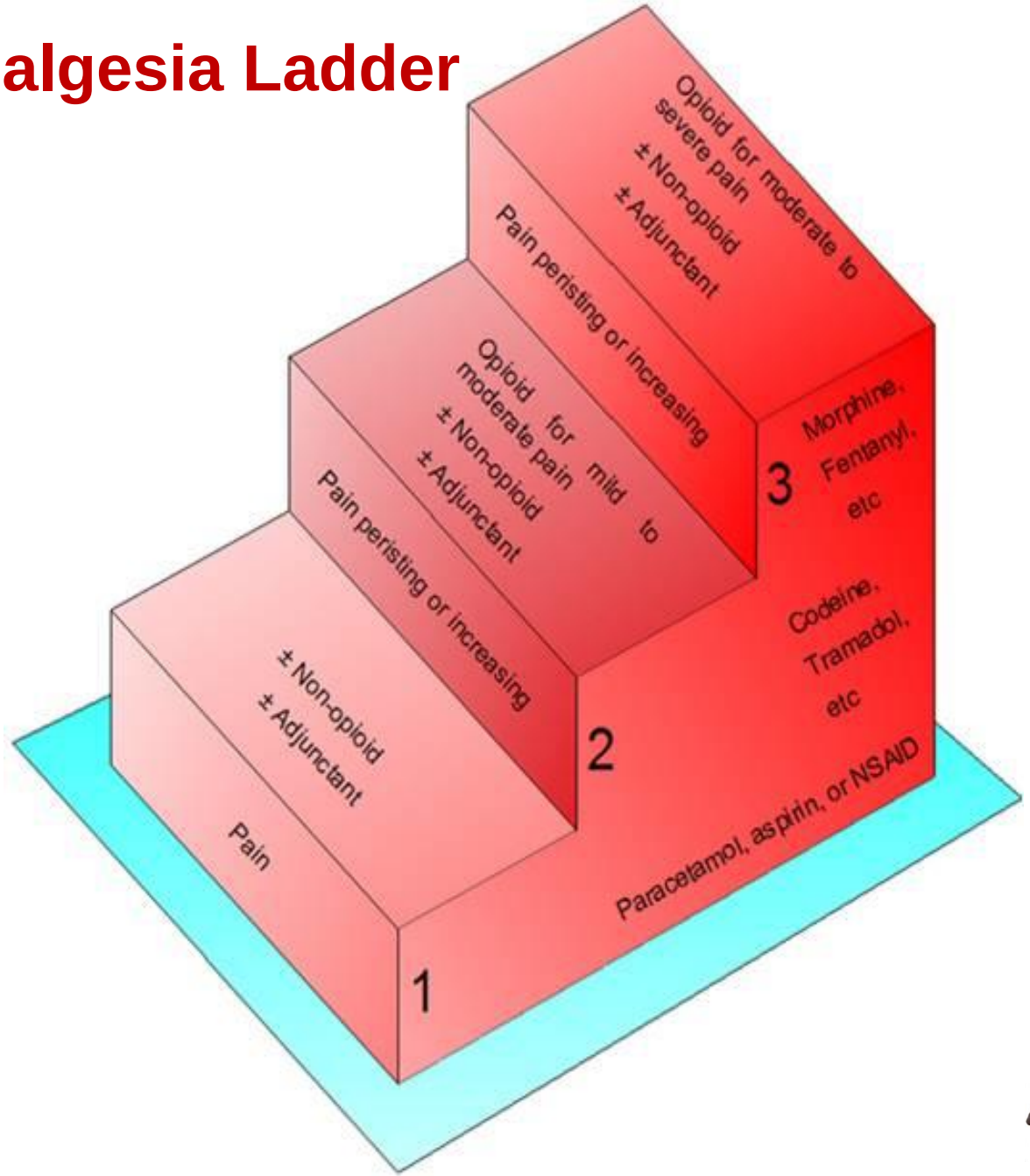
70% cancer patients experience moderate to severe pain

Prescribe regular analgesia with PRN/Breakthrough back-up

WHO Analgesia ladder exists for analgesia management decisions

SIMPLY FINALS

Analgesia Ladder



SIMPLY FINALS

Case…

Mrs CA is a 80yo has known inoperable metastatic breast cancer. She is complaining of significant pain which has previously been managed with non-opioid analgesia.

What dose of morphine would you prescribe?

Morphine Sulphate 5-10mg every 4 hours
with Morphine Sulphate 5-20mg PRN 2-4hrly

SIMPLY FINALS

Case…

Mrs CA's pain is relieved by Morphine Sulphate 10mg but the relief is not sustained until the next dose 4 hours later.

How would you change the regular prescription?

Increase dose by 50%

So now; Morphine Sulphate 15mg every 4 hours
with Morphine Sulphate 5-20mg PRN 2-4hrly

SIMPLY FINALS

Case…

Mrs CA is eventually controlled over a 24 hour period using morphine sulphate as prescribed below:

0800	Morphine Sulphate	**15mg**	2100	Morphine Sulphate	**5mg**
1200	Morphine Sulphate	**15mg**	2200	Morphine Sulphate	**10mg**
1400	Morphine Sulphate	**5mg**	2400	Morphine Sulphate	**15mg**
1600	Morphine Sulphate	**15mg**	0400	Morphine Sulphate	**15mg**
2000	Morphine Sulphate	**15mg**	0600	Morphine Sulphate	**10mg**

Would you change the prescription?
If so, how?

SIMPLY FINALS

Case…

To change regular immediate acting morphine prescription into regular prescription

Work out total 24 hour analgesia requirement to control pain…

0800	Morphine Sulphate	**15mg**
1200	Morphine Sulphate	**15mg**
1400	Morphine Sulphate	**5mg**
1600	Morphine Sulphate	**15mg**
2000	Morphine Sulphate	**15mg**
2100	Morphine Sulphate	**5mg**
2200	Morphine Sulphate	**10mg**
2400	Morphine Sulphate	**15mg**
0400	Morphine Sulphate	**15mg**
0600	Morphine Sulphate	**10mg**

Total = 120mg

REMEMBER SIDE EFFECTS

1. Change to Controlled Release morphine preparation
Either : Morphine Sulphate MR / MST 120mg OD or 60mg BD

2. Plus Breakthrough Pain prescription PRN
One-sixth of total dose
Morphine Sulphate 20mg PRN

SIMPLY FINALS

Other Analgesia methods

Neuropathic pain

Antidepressants

Amitriptyline (TCA) / Duloxetine

Descending NA/Serotonin pathways to the spinal cord limit the pain signals.

Antidepressants relieve neuropathic pain in non-depressed persons

Anti-convulsants

Gabapetnin/Pregabalin – block neuronal Ca channels. Ix diabetic neuropathy.

Carbamazepine effective in trigeminal neuralgia

Other

Transcutaneous electrical nerve stimulation (TENS)

?MOA: Block pain transmission through stimulation of A-fibre / Endorphin release.

No evidence that TENS provides more analgesia than placebo

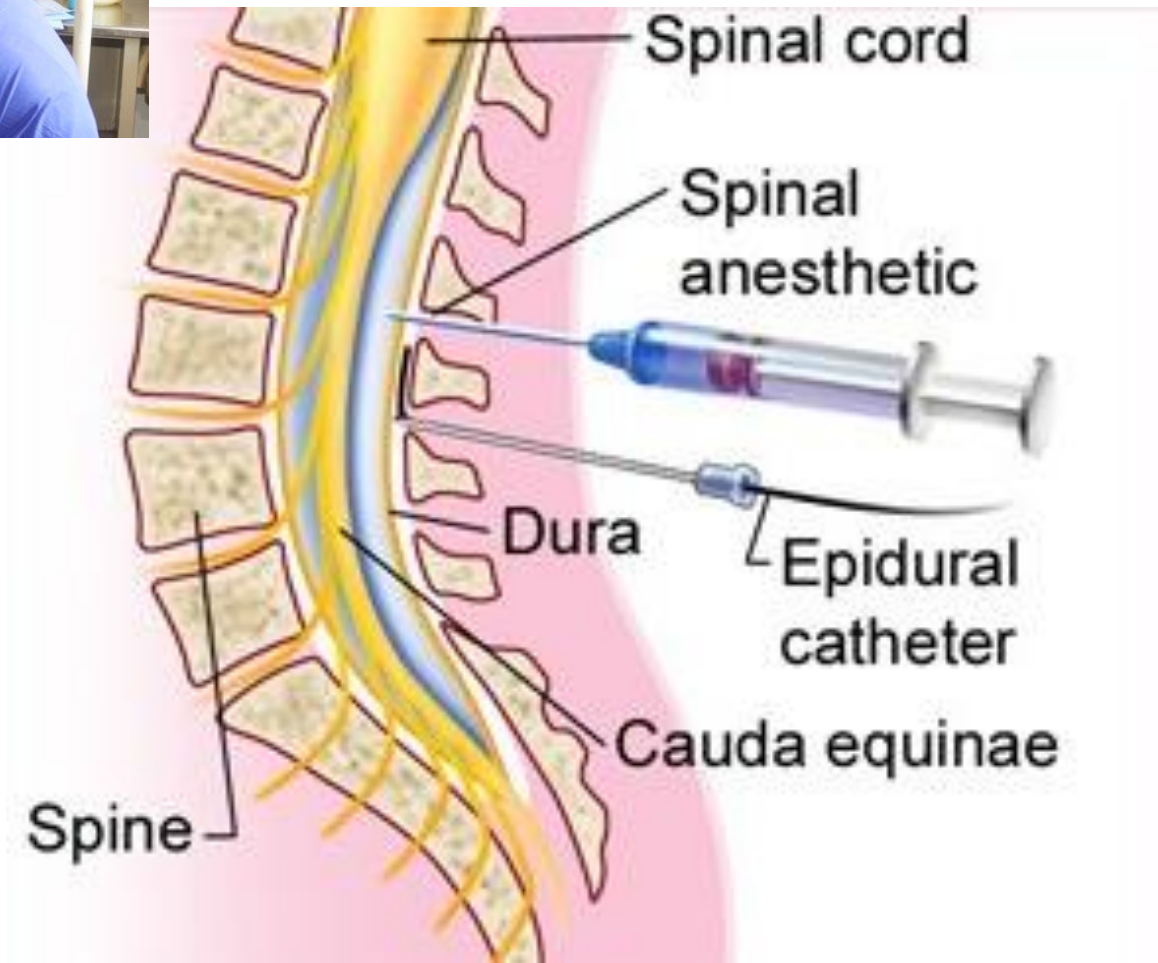
Nitrous oxide

Short term analgesia for procedure/labour.

Easy / able to use intermittently / can self administer. Can cause drowsiness / nausea

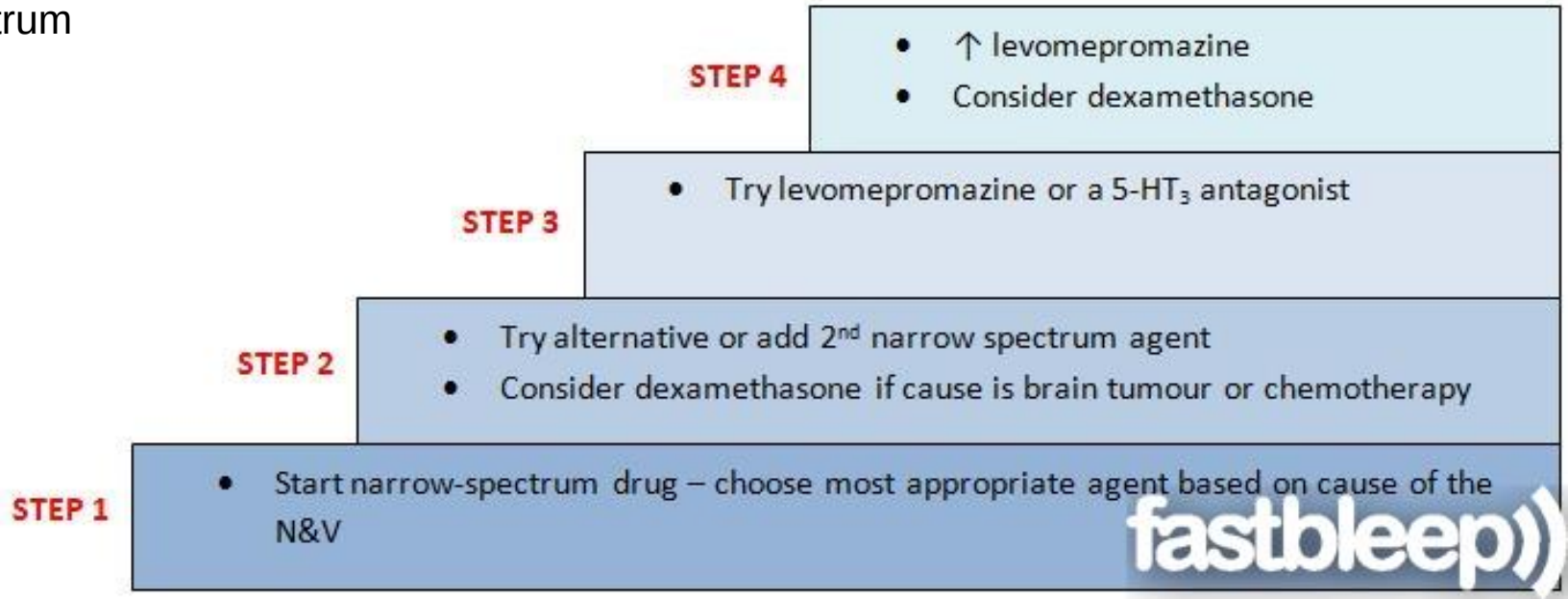
SIMPLY FINALS

Spinal vs. Epidural



Anti-emetics

Cyclizine	***50mg TDS PO/IM/IV***	Anti-histamine
Post op / GI obstruction / vestibular disorders		
Ondansetron	***4-8mg BD PO/IM/IV***	5HT3 antagonist
Severe / resistant cases e / chemo or radiotx		
Metoclopramide	***10-20mg TDS PO/SC/IM/IV***	Benzamine
GI causes, migraine, with opioids		
Domperidone	***10-20mg TDS PO***	Benzamine
Parkinson Disease, chemotherapy		
Haloperidol	***0.5-1.5mg PO/SC***	Phenothiazine
Opiate s/e, post op, chemo/radiotherapy		
Levomepromazine	***6.25-25mg OD or BD***	Phenothiazine
Broad spectrum		



Laxatives

Osmotic
Non-absorbable salts which increase water retained in large bowel
e.g. Lactulose, magnesium sulphate, macrogols

Bulk-forming
Increase faecal mass which stimulates perstalisis. For those with small hard stools.
e.g. Dietary fibre, wheat bran, Ispaghula Husk

Stimulant
Increase intestinal motility. s/e abdo cramping
e.g. Senna, dantron bisacodyl, docusate sodium

Suppositories
e.g. glycerol, bisacodyl

Enemas
e.g. docusate sodium, arachis oil

SIMPLY FINALS

Summary

Discussed common analgesia

Acute analgesia

Chronic/Palliative prescribing

Paracetamol Overdose

Laxatives/Anti-emetics

SIMPLY FINALS