

2 Anaesthetics

ANALGESIA

- simple
- weak opiates (ie oral)
- strong opiates
- adjuncts/mechanistic
 - **Ketamine 0.3mg/kg; 0.1mg/kg/hr**
 - **Amitriptyline 75mg or Pregabalin 150mg**
 - **BZDP** - **Buscopan**
 - **Capsaicin** cream - Anti-inflammatories
 - **Cannabinoids** - **Triptans**

Nitrous Oxide

Presentations

- Entenox O₂: N₂O 50:50
- Blender O₂: N₂O 100:0 → 30:70

Indications

- Anxiolytic, analgesic - Carrier gas in OT
- Pulmonary vasodilator in ICU

Contraindications

- **Gas filled spaces**
 - PTX, - Hernia - Bowel obstruction
 - DCI - Head injury - COPD with bullae
- **Need for > FIO₂ 50%**
- Compliance eg alcohol, elderly, confused
- Pregnancy (miscarriage)

Adverse Effects

- Mask intolerance - Dysphoria
- Vomiting - Apnoea
- Dysbaric eg PTX - **Diffusion hypoxia (fink effect)**
- Miscarriage/infertility - **Emesis**

PROCEDURAL SEDATION

Indications

- # ± dislocation reduction *not in ED: endoscopy, ECT, dental, TOE*
- DCCV
- FB removal

Contraindications

- Unstable - No resource/skills
- High ASA - Allergy
- Procedure not quick or indicated
- Airway risk: known or suspected
- **Aspiration risk: fasting, lap band, reflux**

ASA

1. Well *NB Safe to do ASA 1 or 2*
2. Mild disease
3. Severe disease
4. Severe disease with **constant life threat**
5. Moribund, death without operation

Complications

- ↓ BP - Resp depression
- Aspiration - Pain (procedure or propofol)
- Awareness - Unable to improve
- Allergy - Make worse

Medications

- Combo 1: **Propofol + Fentanyl Midazolam**
- Combo 2: **Ketamine**

Drug	Bolus	Aliquots
Propofol	0.5-1.0 mg/kg	0.25-0.50
Fentanyl	1-2 µg/kg	0.5-1
Midazolam	1mg old, 5mg not old	
Ketamine	1-1.5 mg/kg	0.5-1.0

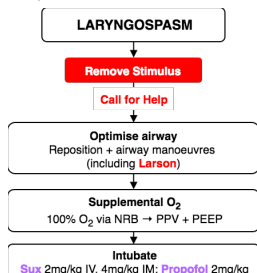
Ketamine

Adverse Effects

- HEAL**
- Hypersalivation - Vomiting
- Emergence - Catalepsy
- Apnoea - Bystander anxiety
- Laryngospasm - Allergy

Contraindications

- General proc sedation CI (above)
- Procedures that stimulate airway reflexes
- **URTI or active pulmonary disease**
- **< 12 months old**
- Head injury/**poor seizure control**
- Psychosis



LOCAL ANAESTHETICS

1% = 10mg/ml; 2% = 20mg/ml, 1:1000 = 1mg/ml

	Lignocaine	Ropivacaine	Prilocaine
Onset	2 m	5 m	10 m
DOA	1/2-6 h ¹	2-6 h	0.5-1.5 h
Max Dose	3/7 mg/kg ¹	3 mg/kg	6 mg/kg ²
Cardiotoxicity	++	+++	+ ³

DOA Duration of Action
¹Without/With Adrenaline
²Dose in **Biers** = 3mg/kg
³Highest risk of **MetHb**, occurs with doses > 10mg/kg

LA Adjuncts

- Topical analgesia - Needle: fine, slow, long
- Temp 37C - Acid buffer with 1:10 4.2% HCO₃
- Through wound - Distraction

LA Toxicity

Systemic Absorption

- IC > tracheal > Epidural > B Plexus > Mucosa > Distal peripheral n > s/cut ∴ dose for IC 1/10 s/cut

Features

- Early - Light headed, peri-oral parasth, tinnitus
- Moderate - Slurred speech, nystagmus
- Severe - Seizure, ALOC
- Severe - Coma
- Arrhythmia (cardiac occurs after neuro)
- Arrest (resp or cardio)

MetHb

- **Risk > 10 mg/kg** (but not dose related)
- Incl **benzocaine, lignocaine, prilocaine**
- Kids more susceptible (even topical LA)

Management

- Prevent: dose, aspirate, USS, **adrenaline**, regional/alt
- Remove additional toxin/limit systemic exposure
- Avoid acidosis - 1RR
- Prolonged CPR - **NaHCO₃** 1-2mmol/kg
- **IVLE 1.5ml/kg bolus, 0.25-5ml/kg/min**
- **BZDP** for seizures
- **Methylene blue** 1-2mg/kg if **MetHb**
- **Amiodarone** 5mg/kg if arrhythmic
- **Phentolamine** if **adrenaline** extravasation

INTRAVENOUS REGIONAL

Indications

- Below elbow, Laceration, Manipulation, FB removal

Contraindications

- AEIOU.PQRST**
- Allergy - Patient: < 10
- Emergent - Quality HTN > 220mmHg
- IV access (none) - Resources unavailable
- Open # - Site: comp, wound, elbow
- Uncooperative - Toxicity: MetHb risk factors

Method

- 1 Consent, premed, bilateral IV access
- 2 Check equipment incl IVIL
- 3 Apply tourniquet with velband
- 4 Elevate limb
- 5 Inflate prox cuff > 100mmHg (use rad to confirm)
- 6 Inject **Prilocaine 3mg/kg** (max dose 6mg/kg)
- 7 Remove cannula, apply pressure
- 8 Reduce USS or XR cast
- 9 Deflate **AFTER** 20min (max 90min)
- 10 Observe for toxicity

Complications

- Cuff leak/tox - Compartment - Post procedure pain
- MetHb - Neuropraxia - Tourniquet pain
- Arrest - Make worse - Unable to improve

REGIONAL BLOCKS

Digital, Brachial Plexus, Dorsal penile (see urology)

Pros

- Less LA = less Toxicity
- Less painful/anxiety
- Less tissue distortion

Cons

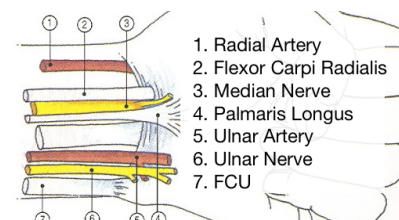
- Closer to big vessels = tox
- Nerve damage
- Risk of failure

Upper Limb

Wrist

Radial nerve is 'radial' to radial artery, Ulnar nerve is 'ulnar' to ulnar artery

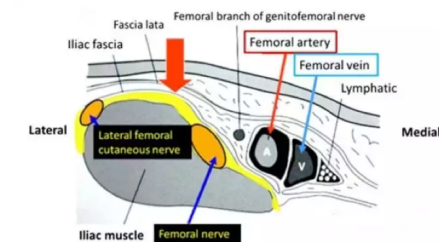
- **Median** Btwn PL & FCR
- **Ulnar** Btwn FCU & ulnar art
- **Radial** 2cm prox to radial styloid



Lower Limb

Fascia Iliaca

- Femoral (L2-4), obturator (L2-4) & lat cutaneous (L2-3)
- 30-40 ml **Ropivacaine**
- USS guided in-plane
- Blind technique:
 - Mark line pub tubercle to ASIS & divide into 3rds
 - Inject 2.5cm below outer 2/3 division
 - 2 pops felt: **1. Fascia Lata 2. Iliac Fascia**



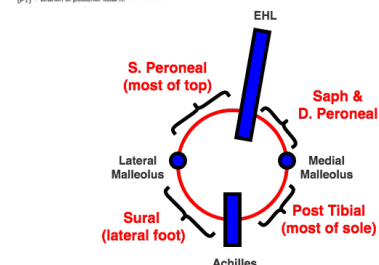
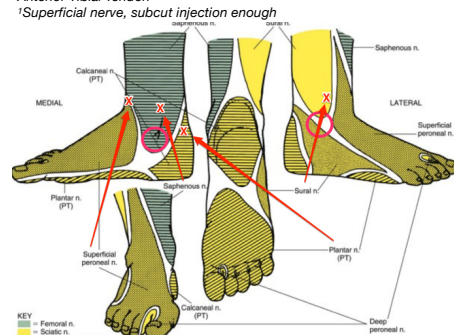
Ankle

	Innervation	Landmark
Plantar (bottom)		
Post Tibial	Most of Sole	Btwn Med mall + Achilles (post to post tib artery)
Sural ¹	Lateral foot (dorsal & volar)	Btwn Lat mall + Achilles (1cm above mall)

Dorsum (top)

Saphenous ¹	Medial leg	Btwn Med mall + AT
S. Peroneal ¹	Dorsum foot	Btwn EHL & Lat mall
D. Peroneal	1st web space	Btwn AT & EHL (1cm above base of Med mall)

S Superficial; D Deep; Mall Malleolus; EHL Extensor Hallucis Longus; AT Anterior Tibial Tendon



Other

Face

- Supraorbital (V1): midline above brow
- Infraorbital (V2): infraorbital ridge
 - Cutaneous or mucosal (1st premolar)
- Mental (V3): mucosal fold 1st mand premolar

Auricular

- Another field anaesthesia
- Outer helix posterior to ear
- Superior & auricular anterior to ear

