

## 13 ANAESTHETICS

### 13.01 INHALATIONAL & IV ANAESTHETICS

GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<b>Halothane (Fluothane) 250ml</b>	EDL	Using a suitable vaporiser, induction: increased gradually to 2-3% in oxygen or nitrous oxide-oxygen; maintenance: 0.5-1.5%; Child 1.5-2%. Avoid within 3 months of a previous exposure.
<b>Isoflurane (Forane) 250ml</b>		Using a suitable vaporiser, induction: increase gradually from 0.5%-3% in oxygen or nitrous oxide-oxygen; maintenance 1-2.5% in nitrous oxide-oxygen.
<b>*Ketamine (as HCl) Inj 50mg/ml, 10ml (Ketalar)</b>	EDL	<p>Induction and maintenance of anaesthesia: Deep IM undiluted 4-8mg/kg (duration of anaesthesia up to 25 min) repeated according to response. Slow IV undiluted over 1 min of 1-4.5mg/kg/DOSE (duration of anaesthesia 5-10 min after 2mg/kg dose) repeated according to response. IV infusion total induction dose 0.5-2mg/kg, maintenance 10-45ug/kg/min (microdrip) according to response.</p> <p>For IV infusion further dilute 500mg (10ml) with 490ml of D5/NS to give 1mg/ml solution.</p>
<b>*Nitrous Oxide Inhalation Gas</b> <b>[Cylinder neck: colour code blue]</b>	EDL	<p>Anaesthesia: adult &amp; child 70% nitrous oxide mixed with at least 30% oxygen.</p> <p>Analgesia: 50% nitrous oxide mixed with 50% oxygen.</p>

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GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<p><b>*Oxygen Inhalation Gas</b></p> <p>[Cylinder neck: colour code white]</p>	EDL	Concentration of oxygen in inspired anaesthetic gases should not be less than 21% (but > 80% oxygen gives toxic effects).
<p><b>Propofol Inj 1% 10mg/ml 20ml, (Diprivan)</b></p> <p>°Fridge Item</p>		<p>Induction: IV Inj (undiluted) or IV infusion; 1-2mg/kg/DOSE at the rate of 20-40mg every 10 seconds; maintenance infuse IV 4-12mg/kg/hr. Child &gt; 3 yo, induction adjust as needed 2.5mg/kg/DOSE; maintenance 9-15mg/kg/hour.</p> <p>IV infusion, dilute 200mg in 80mls of D5 to not less than 2mg/ml to preserve emulsion.</p>
<p><b>Sevoflurane 250ml (Sevorane)</b></p>	NF	Using a specifically calibrated vaporiser, induction up to 5% in oxygen or nitrous oxide-oxygen. Maintenance 0.5-3%.
<p><b>Thiopentone Sodium Inj 500mg vial (Thiopental)</b></p>	EDL	<p>Induction: slow IV in fit pre-medicated adults: 100-150mg according to response, max 4mg/kg/DOSE; child induction slow IV 2-7mg/kg/DOSE.</p> <p>For IV injection reconstitute 500mg vial with 20ml WFI and give over 10-15 seconds, max conc 25mg/ml (2.5% solution).</p>

**COMMENT/CAUTIONS:**

- All inhalation agents must only be used in the appropriate vaporisers.
- **Halothane** hepatotoxicity: recommendations - 1) take careful anaesthetic history to determine previous exposure/reactions to halothane; 2) avoid repeated exposure within 3 months unless there are overriding clinical circumstances; 3) absolutely contraindicated in patients with a history of unexplained jaundice/pyrexia following halothane exposure.

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**COMMENT/CAUTIONS (CONT.):**

- **Ketamine C/I:** Thyrotoxicosis, hypertension, cerebral & psychiatric disorders. Cautious use in hypertension or high intra-cranial pressure.
- **Nitrous oxide C/I:** Discontinue if there is demonstrable collection of air in pleural, pericardial or peritoneal space; intestinal obstruction; occlusion of middle ear; arterial air embolism; decompression sickness; chronic obstructive airway disease; emphysema.
- **Oxygen:** FIRE HAZARD: Avoid use of cautery when oxygen is used with ether; reducing valves on oxygen cylinders **must not** be greased (risk of explosion).

**13.02 LOCAL ANAESTHETICS**

GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<b>Bupivacaine HCl Inj 0.25% (2.5mg/ml), 50ml or 100ml (Marcain)</b>  <b>[Max cumulative safe dose for adult &amp; child of 0.25% bupivacaine is 1.5mg/kg]</b>	EDL	Caudal anaesthesia: Moderate motor block: 37.5-75mg (15-30ml) as 0.25% solution, repeated every 3 hourly as needed. Epidural anaesthesia: Partial to moderate motor block: 25-50mg (10-20ml), q3h <i>prn</i> . Local infiltration: Single dose 175mg (70ml). Sympathetic block: 50-125mg (20-50ml) q3h <i>prn</i> .
<b>Bupivacaine HCl Inj 0.5% (5mg/ml) 50ml or 100ml (Marcain)</b>  <b>[Note: Different preparation compared to Marcain Heavy, which contains glucose for spinal anaesthesia.]</b>	EDL	Caudal anaesthesia: Moderate to complete motor block: 75-150mg (15-30 ml) as a 0.5% solution, repeated every 3 hourly as needed. Epidural anaesthesia: Moderate to complete motor block: 50-100mg (10-20ml) q3h <i>prn</i> . Peripheral nerve block: Moderate-complete motor block: 25-175mg (5-37.5ml) q3h <i>prn</i> .
<b>Bupivacaine HCl Inj 0.75% (7.5mg/ml) 50ml or 100ml (Marcain)</b>	EDL	Epidural anaesthesia: Complete motor block: 75-150mg (10-20ml) as a 0.75% solution. Retrobulbar block: 15-30mg (2-4 ml) as a 0.75% solution.

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GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<b>Epinephrine Inj 100ug/ml, prefilled syringe 10mls (1mg/10mls) [Adrenaline 1:10 000]</b>	EDL	To retard systemic absorption of infiltrated local anaesthetics: according to response, given as 5ug/ml (1 in 200 000) solution diluted in NS; in dental surgery up to 12.5mg/ml (1 in 80 000) solution used.
<b>Phenylephrine Inj 1% (10mg/ml)</b>		Acute mild-moderate hypotension: SC/IM undiluted 2-5mg, repeat dose at 10-15 min intervals, max total dose 10mg; slow IV 0.2-0.5mg (200-500ug), repeat dose at 10-15 minutes intervals, injected slow IV diluted in D5/NS as 1mg/ml solution over 3 minutes.

#### 13.04 MUSCLE RELAXANTS USED IN OR

GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<b>Atracurium Besylate Inj 50mg/5ml (Tracrium) [Non-depolarising]</b>		Adult/child rapid IV Inj undiluted initially 300-600ug/kg/DOSE, then 100-200ug/kg/DOSE when needed. For IV infusion give 400-600ug/kg/hr at 5-10ug/kg/min, diluting 50mg with 95mls of D5/NS to give a solution of 0.5mg/ml concentration.
<b>Diazepam Inj 5mg/ml, 2ml (Valium)</b>	<b>PS</b> <i>MSL</i>  EDL	Acute muscle spasm: slow IV undiluted or diluted in D5 (adult: max rate 5mg/min; infant/child: do not exceed 1-2mg/min IV push) repeated <i>prn</i> after 4hr, adult 5-10mg, child 100-200ug/kg/DOSE.
Note: All non-depolarising and polarising neuromuscular blocking agents should be used only if artificial ventilation for the patient is available.		
<b>PS</b> – Drugs subject to international control under the Convention on Psychotropic Substances (1971).		

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GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<b>Rocuronium Bromide Inj</b> <b>50mg/5ml (Esmeron)</b> <b>[Non-depolarising]</b>	NF	IV Inj, intubation 600ug/kg/DOSE, maintenance 150ug/kg/DOSE. IV infusion 300-600ug/kg/hr. See product leaflet for details.
* <b>Suxamethonium Chloride Inj</b> <b>50mg/ml, 2ml or 500mg vial</b> <b>(=Succinylcholine)</b> <b>(Celocurine)</b> <b>[Depolarising]</b>  °Fridge Item (liquid form)	EDL	Short acting. IM infant up to 5mg/kg/DOSE; child up to 4mg/kg/DOSE, max 150mg. IV injection adult & child 0.3-1mg/kg/DOSE followed as required by supplemental doses of 300ug/kg; infant 2mg/kg/DOSE. IV infusion adult & child 2-5mg/min of 1-2mg/ml solution (dilute 500mg with 250-500mls of D5/NS) according to response.
<b>Vecuronium Bromide Inj</b> <b>4mg/ml or 10mg vial (Norcuron)</b> <b>[Non-depolarising]</b>	EDL	Intubation: adult & child > 5 mth slow IV initially 80-100ug/kg/DOSE then 20-30ug/kg/DOSE when needed, child < 4mth initially 10-20ug/kg/DOSE titrate as needed. IV infusion adult initial bolus 40-100ug/kg then 0.8-1.4ug/kg/min, titrate as needed.  For IV injection further dilute 4mg with 5-10ml diluent or NS and inject slowly (max conc 2mg/ml), for IV infusion further dilute 4mg with 20-40mls of D5/NS/LR and infuse as above (max conc 1mg/ml).
Note: All non-depolarising and polarising neuromuscular blocking agents should be used only if artificial ventilation for the patient is available.		
PS – Drugs subject to international control under the Convention on Psychotropic Substances (1971).		

**COMMENT/CAUTIONS:**

- **PS Psychotropic Substances.** Recording required in pharmacy/ward/OR.
- **Suxamethonium C/I:** inability to maintain clear airway, burns patients, glaucoma, ocular surgery, liver disease, history of malignant hyperthermia, hyperkalaemia. Caution: Atropine must be available as bradyarrhythmias may occur (especially with halothane).

## 13.05 ANTIMUSCARINICS/ANTICHOLINESTERASES

GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<b>Atropine Sulphate Inj 100ug/ml, 600ug/ml &amp; 1mg/ml</b> <b>[Antimuscarinic]</b>	EDL	Pre-anaesthetic induction: IM (undiluted) adult & child 20ug/kg/DOSE 30-60 min before procedure or, adult only, IV (undiluted) immediately before induction up to 500ug. Inhibition of bradycardia: slow IV (undiluted) adult 0.4-1mg, child 10-30ug/kg/DOSE. Control of muscarinic side effects of neostigmine in reversal of competitive neuromuscular block: slow IV (undiluted) adult 600-1200ug, child 20ug/kg/DOSE.
<b>Glycopyrrolate Inj 200ug/ml (Robinul)</b> <b>[Glycopyrronium Bromide]</b> <b>[Antimuscarinic]</b>		Premed, intraoperative: adult 200ug IV/IM (undiluted or IV diluted in D5/NS) to max dose of 400ug, child 4-8ug/kg/DOSE IV to max dose of 200ug. Reversal of neuromuscular blockade: Adult 200ug per mg of neostigmine, child 10ug/kg/DOSE of glycopyrrolate per 50ug/kg of neostigmine (may be mixed with neostigmine in syringe).
<b>*Neostigmine Methylsulphate Inj 2.5mg/ml (Prostigmine)</b> <b>[Anticholinesterase]</b>	EDL	Reversal of non-depolarising neuromuscular blockade: slow IV (undiluted, over 1 min) 2.5-3.75mg with supplemental doses of 500ug if needed to max total dose 5mg; child 40ug/kg/DOSE. (To reduce muscarinic effects, give atropine sulphate IV adult 0.6-1.2mg & child 20ug/kg/DOSE with or before neostigmine).

**COMMENT/CAUTIONS:**

- **Neostigmine** acts within one minute of IV injection and lasts for 20-30 min.
- **Neostigmine** must be used combined with atropine to prevent muscarinic effects occurring.

## 13.06 ANAESTHETIC-RELATED MISC DRUGS

GENERIC (TRADE) NAME	CAT.	INDICATION/DOSE
<b>Dantrolene Inj 20mg or 70ml infusion (Dantrium)</b>		<p>Malignant hyperthermia: rapid IV injection, 1mg/kg/DOSE repeat as required until symptoms subside or to a cumulative max dose 10mg/kg.</p> <p>Reconstitute 20mg vial with 60ml WFI, shake well to give 0.33mg/ml solution, keep at 15-30°C, protect from direct light and use within 6 hours following reconstitution.</p>
<b>Dehydrobenzperidol Inj 2.5mg/ml, 2ml (Droperidol)</b>		<p>Note. The max recommended initial dose is 2.5mg IM/IV slow. Additional 1.25mg doses may be administered with caution to achieve the desired affect only if the potential benefit outweighs the potential risk.</p> <p>Adjuvant to general anaesthesia: Premed IM 2.5mg 30-60 min pre-op; induction IV/IM 2.5mg/kg/DOSE or 0.1-0.14 mg/kg/DOSE, initial max dose 2.5mg; IV maintenance dose 1.25-2.5mg.</p> <p>Nausea &amp; vomiting post-op prevention: IV 7-20ug/kg/DOSE. Conscious sedation IM 1.25mg 30-60 min before diagnostic procedure.</p> <p>Droperidol may be diluted to a convenient volume with D5/NS/LR.</p>

**COMMENT/CAUTIONS:**

- **Dehydrobenzperidol S/E:** May cause arrhythmias, reserve as second line treatment for tranquillisation and reduction of nausea and vomiting in surgical procedures.