

Anesthesia – Pocket guide

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Induction agent

Propofol: 10 mg/ml, 20 mg/ml

- Induction anesthesia: 2 mg/kg (children - 2.5-3.5 mg/kg), Sedation bolus: 0.5 mg/kg
- Maintenance of anesthesia: 4-10 mg/kg/h in descending dose, TCI 2-6 µg/ml, Sedation: 0.5-4 mg/kg/h
- Avoid: Sedation on ICU <16 years

Pentothal (thiopentone): 25 mg/ml

- Induction anesthesia: 4-6 mg/kg (70 kg -14 ml)
- Avoid: porphyria, upper airway obstruction, asthma attack, extravasal & intrarterial injection

Ketamine: 10 mg/ml iv, 50 mg/ml im

- Induction anesthesia: 1-2 mg/kg iv, (5) -10 mg/kg im + midazolam 1-3 mg (silent on saline)
- Maintenance of anesthesia: 0.5-4 mg/kg/h iv in decreasing dosage
- Post-op pain relief: 5-15 mg bolus, maintenance inf: 0.05-0.5 mg/kg/h
- Avoid: hypertension (relative contraindication), In liver failure -> dose reduction

Esketamine: 5 mg/ml iv, 25 mg/ml im => half the ketamine dose

Muscle relaxants:

Succinylcholine (Suxamethonium): 50 mg/ml iv

- Intubation dose: 1-1.5 mg/kg iv (give pre-treatment with atropine)
- Cave: hypercalcaemia, malignant hyperthermia, muscle diseases, large tissue damage

Rocouronium: 10 mg/ml iv

- Tracheal intubation dose: 0.6 mg/kg (90 sec-> intub), 1.0 mg/kg (60 sec -> intub)
- Cave: Previous reaction to muscle relaxants, myasthenia or similar neuromuscular disease.
- Acute reversal: Sugamadex 16 mg/kg (70 kg = 1120 mg = 11.2 ml). Given iv as a bolus of 10 sec

Atracurium: 10 mg/ml iv

- Tracheal intubation dose: 0.6 mg/kg iv (1.0 mg/kg at RSI)
- Effect approx 90 sec - duration approx 35 min. Maintenance dose: 0.1-0.2 mg/kg (10-20 mg)
- Cave: Previous reaction to muscle relaxants, myasthenia or similar neuromuscular disease.

Opioids:

Alfentanil: 0.5 mg/ml iv - about 25 times the potency of morphine (1 ml alfentanil ≈ 12.5 mg morphine)

- Maximum power within 90 sec - duration 5-10 min. Can provide muscle rigidity especially at high doses.
- Shorter painful intervention: 0.25-0.5 mg - repeat vb.
- Optimum intubation dose: 20 µg/kg iv (70 kg = 1.5 mg = 3 ml)
- TIVA (µg/kg/min) - Intubation 0.4-0.5, Maintenance 0.2-0.7 µg/kg/min
- TCI (ng/ml) - Intubation 40-50, Maintenance 40-80 ng/ml)

Fentanyl: 50 µg/ml (iv) - about 100 times the potency of morphine (1 ml fentanyl = 5 mg morphine)

- Intubation dose for general anesthesia: 1-5 µg/kg iv (70 kg = 70-350 µg = 2-12 ml)
- For children 2-12 years, 1-3 µg/kg is given in comb. with inhalation anesthesia

Remifentanyl 50 µg/ml:

- Intubation: TIVA 0.25-0.5 µg/kg/min, TCI 5-8 ng/ml
- Single dose induction 1 µg/kg, induction without muscle relaxants 2-3 µg/kg (90 sec to effect)
- Maintenance: TIVA 0.15-0.5 µg/kg/min (TCI 4-10 ng/ml)

Inhalation anesthesia:

Sevoflurane (Blood/gas solubility coefficient 0,68, CO₂↘, HR-, SVR↓, BP↓, RR↑↑, TV↓, pCO₂↑)

- MAC: newborn 3.3%, 25 years 2.5%, 60 years 1.7%, 80 years 1.4%. N₂O reduces the need by about 25%.
- Not respiratory irritating:

suitable for induction, provides uterine relaxation, dose-dependent cardiodepression

Desflurane (Blood/gas solubility coefficient 0,42, CO₂↘, HF↑↑, SVR↓, BP↓, AF↑↑, TV↓, pCO₂↑)

- MAC: 25-year 7%, 45-year 6.0%, 70-year 5%. N₂O reduces the need by about 25%.
- Uterus relaxation, respiratory tract - not suitable for induction, dose-dependent cardiodepression.

Nitrous Oxide N₂O (Blood/gas solubility coefficient 0,42. Small effect on circ and resp. BP-, TD↓, RR↑)

- MAC: 105%. Upon induction 30-70% by volume with O₂ + or other anesthetic gas.
- Avoid: Pneumothorax, pneumopericardium, gas embolism, head injury, ileus, B12 deficiency

Vasopressor agents

Efedrine 5 mg/ml: Direct receptor agonist + NA-release→ α₁ +, β₁+++ , β₂ ++ = SVR↗, CO↑, HR↑, BP↑

- Indication: Blood pressure drop, bronchial asthma

Dosage: 5-10 mg iv effect 10-15 min (for longer lasting effect 25-50 mg can be given im

- Side effects: Tachycardia, arrhythmias (AF), coronary ischemia

Phenylefrine 0,1 mg/ml: (α₁ ++++ = SVR↑, CO↘, HR↘, BP↑)

Dosage: 0.1-0.2 mg iv, total infusion 0.05-0.15 µg/kg/min iv = about 3 - 20 ml/h for 70 kg

- Side effects: Bradycardia, heart failure, pulmonary edema

Norepinephrine α₁ ++++ , β₁+++ , β₂+ (SVR↑, CO→, HR↗, BP↑

- Indication: Sepsis, anaphylactic shock, hypotension with SVR ↓
- Dosage: 0.01-0.5 µg/kg/min = 0.5-40 ml/h for 70 kg (0.1 mg/ml)

Antiemetics:

Droperidol = dopamine antagonist: 2.5 mg/ml

0.5-2.5 mg (most effective dose 1 mg)

- Cave: QT prolongation (ECG monitoring 2-3 hours after inj), Pheochromocytoma

Ondansetron = serotonin antagonist: 2 mg/ml

- 4-8 mg iv as prophylaxis (8 mg most effective dose)
- 1 mg symptomatic of already established PONV

Betametsan - 4-8 mg preoperatively

Other - **Metoclopramide** 20 mg, Atropine 0.5 mg, Oxygen 80%

Steroid equipotency:

100 mg Hydrocortisone ≈ 25 mg Prednisolone ≈ 3.3 mg Betametsan ≈ 20 mg Solu-Medrol

Neostigmine (cholinesterase inhibitor-> acetylcholine conc. increases): 2.5 mg/ml iv

Dosage: 30-70 µg/kg. Standard dose 2.5 mg = 1 ml

- Combined with anticholinergics: 0.5 mg glycopyrrone or 0.5 mg atropine

MALIGNANT HYPERTHERMIA:

- Triggers: Succinylcholine + inhalation gases.
- Symptom: Muscle rigidity, rate increase 1°C/5 min, EtCO₂ ↑, sweating, tachycardia
- Hyperventilate etc. x 2-3 100% O₂, change to TIVA, disconnect carburetor, exit op.
- Dantrium starting dose 2.5 mg/kg (in coarse pvc/CVC) - repeat 1mg/kg until temp ↓.