

Gray Weight 5 kg Gray

Heart rate 100 to 160

SBP 70 to 85

Resp 35 to 55

Acetaminophen (Tylenol): Oral drops: 80 mg/0.8 ml = 100 mg/ml
Suppository: 120 mg

Route	Dose per kg	Onset	Duration	Dose	ml to give
PO, PR	15 mg/kg	30 m	4 hr	75 mg	0.8 ml of 100 mg/ml

Alerts: Check concentration, as there are many different formulations. Suppository also available.

Comments: Equivalent to NSAID's for pain and fever, but has no anti-inflammatory effect. Oral liquid can be 100 mg/ml infant drops OR children's suspension 160 mg/5ml. Do not exceed 5 doses per day and use with extreme caution in children with hepatic dysfunction.

Diazepam: Intravenous formulation (same for IV or PR): 5 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV	0.2 mg/kg	1-3 m	0.5 hr	1 mg	0.2 ml
PR	0.5 mg/kg	2-15 m	0.5 hr	2.5 mg	0.5 ml

Alerts: Resp depression with fast IV push. Rectal gel available at 2.5 mg/ml.

Comments: Not a first line drug. Works for status epilepticus, but midazolam or lorazepam preferred. Works for sedation but midazolam or lorazepam preferred. Push slowly IV. May repeat IV dose q 10 minutes prn, with max total dose of 5 mg. Decrease dose by ½ if given with morphine. IV solution can be administered with lubricated TB syringe (no needle) into rectum. Rectal gel easier to insert into rectum, but expensive.

Etomidate: Intravenous formulation: 2 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV	0.2 mg/kg	30-60 sec	2-15 min	1 mg	Sedation dose 0.5 ml
IV	0.3 mg/kg	30-60 sec	5-15 min	1.5 mg	RSI dose 0.75 ml

Alerts: Give lower dose for sedation for imaging. Watch for myoclonus, vomiting.

Comments: Use starting dose of 0.2 mg/kg for sedation for imaging.
Use with narcotic (e.g., fentanyl) for procedural sedation.
Use higher dose of 0.3 mg/kg for induction for rapid sequence intubation.
Increase by 0.05 mg/kg every 60-90 seconds to maximum of 0.4 mg/kg (4 mg).

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Fentanyl: IV/IM formulation: 100 mcg/2ml = 50 mcg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV, IM	1 mcg/kg	<1 m IV 7-15 m IM	30-60 m	5 mcg	0.1 ml

Alerts: Resp depression, reversible with naloxone. Avoid rapid infusion, as it may lead to rigid chest syndrome and need for respiratory support.

Comments: Start with 1 mcg/kg. Max 100 mcg single dose. May repeat dose q5-10 minutes prn. The respiratory depressant effects may last longer than analgesic effects. Best drug for major trauma cases and possible hypoperfusion.

Fentanyl (Intranasal): Use IV formulation for intranasal administration:
100 mcg/2ml = 50 mcg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IN	1.5 mcg/kg	1-2 m	½-2 hr	7.5 mcg	0.15 ml

Alerts: Atomizer needed to nebulize drug intranasally to maximize absorption.

Comments: Put half of each dose in each nostril. May repeat 0.5 mcg/kg dose q 5-10 minutes prn. The respiratory depressant effects may last longer than analgesic effects. Use when vascular access unavailable or unnecessary. Has not been trialed on <3 yo.

Hydromorphone (Dilaudid): IV/IM formulation: 2 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV, IM	0.02 mg/kg	2-5 m	4-5 hr	0.1 mg	0.05 ml

Alerts: Resp depression possible. Contraindicated in status asthmaticus.

Comments: Not recommended for children intolerant or unresponsive to morphine. Excellent alternative to morphine for sickle cell pain. 1 mg hydromorphone = 7 mg morphine.

Ketamine: IV/IM formulation: 50 mg/ml

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Route	Dose per kg	Onset	Duration	Dose	ml to give
IV	1-2 mg/kg	30 sec	15-30 m	5-10 mg	0.1-0.2 ml
IM	5 mg/kg	3-5 m	30-90 m	25 mg	0.5 ml

Alerts: Laryngospasm, hypersalivation, vomiting. Contraindicated if increased intracranial or intraocular pressure. Watch for emergence reaction, nausea/vomiting.

Comments: No atropine needed. Do not exceed injection rate of 0.5 mg/kg/min or give the dose in less than 1 minute.

Lorazepam (Ativan): IV/IM formulation: 2 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV, IM	0.05- 0.1 mg/kg	2-3 m	6-8 hrs	0.25-0.5 mg	0.13-0.25 ml

Alerts: Check concentration (4 mg/ml also available). Resp depression, especially with fast IV push.

Comments: Best first seizure drug. Decrease dose by ½ if given with morphine.

Midazolam (Versed): IV/IM formulation: 1 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV, IM	0.1 mg/kg	1-5 m	½-1 hr	0.5 mg	0.5 ml

Alerts: Faster metabolism in infants and high doses, up to 0.6 mg/kg, may be needed. Check concentration (also available in 5 mg/ml). Watch for resp depression, especially with rapid IV push.

Comments: Decrease dose by ½ if given with morphine. May increase dose by 0.1 mg/kg every 5 minutes. Max 2 mg single dose IV, max total IV dose 6 mg.

Morphine: IV/IM formulations (multiple): 5 or 10 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
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IV, IM	0.05-0.1 mg/kg	1-3 m	1-2 hrs	0.25-0.5 mg	0.05 – 0.1 ml of 5 mg/ml
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Alerts: Check concentration (multiple formulations). Adjust dose for renal impairment. May cause hypotension or resp depression, nausea, emesis, or pruritis.

Comments: May repeat dose q 5-15 minutes to desired effect. Decrease dose by ½ if given with barbiturates, hydroxyzine/diphenhydramine, or with other benzodiazepines.

Pentobarbital (Nembutal): IV/IM formulation: 50 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV	1-2 mg/kg	3-5 m	15-45 m	5-10 mg	0.1-0.2ml
IM	5 mg/kg	10 m	1-4 hrs	25 mg	0.5 ml

Alerts: May cause hypotension. Paradoxical excitement may occur when administered (small doses of morphine can ameliorate this effect).

Comments: Not first line drug for imaging sedation—use etomidate. Decrease dose by ½ if given with morphine. Do not inject >50 mg/min. Lasts longer than methohexital.

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Reversal Agents

Flumazenil (Romazicon): IV formulation: 0.1 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV	0.01 mg/kg	1-2 m	20-60 m	0.05 mg	0.5 ml

Alerts: Contraindicated if benzodiazepine addiction or concomitant tricyclic antidepressant overdose.

Comments: May repeat 0.02 mg/kg q1 min up to a total of 1 mg.

Naloxone (Narcan): IV/IO/IM/IN/ET formulation: 0.4 mg/ml, or 1 mg/ml

Route	Dose per kg	Onset	Duration	Dose	ml to give
IV, IO, IM, SC, IN, ET	0.1 mg/kg	<2 m (IV, IO), 2-5 m (IM, SC, IN, ET)	30-60 m	0.5 mg	1.3 ml of 0.4 mg/ml

Alerts: Use with extreme caution in neonates to avoid seizures. Contraindicated if hypersensitivity to naloxone.

Comments: May repeat 0.05 mg/kg q2-3 min up to total 2 mg. Max single dose 2 mg. Titrate dose for either partial or complete opiate reversal.

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Topical Pain Management

EMLA (Eutectic Mixture of Local Anesthetics): Formulation: lidocaine 2.5% & prilocaine 2.5% cream (5 g tube)

Route	Max dose	Max area of coverage	Onset	Duration
Topical	2 g	20 cm ² area of skin	60 m	2-3 hrs
Alerts: Do not apply to mucous membranes or open wounds. Apply for no longer than 4 hours. Contraindicated if hypersensitivity to lidocaine or prilocaine. Avoid use in infants <3 months (except circumcision) and those up to 12 months who are also receiving methemoglobin-inducing agents.				
Comments: May cause methemoglobinemia. Anesthesia lasts 1-2 hrs after removal of cream.				

LET (lidocaine, epinephrine, tetracaine): Formulation: Lidocaine 4%, Epinephrine 1:1000, & Tetracaine 0.5% (3 ml bottle)

Route	Dose	Onset	Duration
Topical	1-3 ml	10 m	1-2 hrs
Alerts: Do not use on fingertips, toes, nose, or penis. Max dose is 8 mg/kg of lidocaine. Contraindicated if hypersensitivity to lidocaine, epinephrine, or tetracaine. Avoid contact with mucous membranes.			
Comments: For facial lacerations, apply solution with dropper or gauze (gel is better).			

Lidocaine 1% (Xylocaine): Formulation: Lidocaine 1% (10 mg/ml)

Route	Max Dose	Onset	Duration
Infiltration	2.5 ml	Rapid	½-1 hr
Alerts: Do not exceed 4-5 mg/kg due to risk of seizures, or 8 mg/kg if combined with epinephrine. Do not use lidocaine/epinephrine combo on fingertips, toes, nose, or penis.			
Comments: Buffer lidocaine injection (lidocaine 1%) as a 1:10 mixture of 1 part sodium bicarbonate solution in 9 parts of lidocaine 1% to reduce pain of injection.			