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Addendum. Recommended Moderate Sedation Drugs and Doses: Pediatric and Neonatal

*Rationale for doses exceeding recommended ranges should be documented in the patient's chart.
Pediatric doses calculated on a per-kilogram basis should not exceed a standard adult dose.*

DRUG	RECOMMENDED SEDATIVE DOSE	ONSET OF ACTION (min)	PEAK EFFECT (min) & DURATION	DRUG EFFECTS	REVERSAL AGENT
Fentanyl	<ul style="list-style-type: none"> 0.5-2.0 mcg/Kg IV over 3-5 minutes Not to exceed usual adult maximum dose of 100 mcg in one hour in adolescents 	Almost immediate; less than 2 minutes	Peak within 1-3 minutes; duration 30-60 min	<ul style="list-style-type: none"> Narcotic analgesic with less sedative effect than morphine 100 mcg equal to 10 mg morphine or 75 mg meperidine. Respiratory depressive effects similar to morphine. Maximal respiratory depression at 5-10 minutes with sensitivity of respiratory center normalizing within 1-2 hours. Exhibits minimal hypnotic action & histamine release rarely occurs. Rapid IV push may cause chest wall muscle rigidity 	Naloxone (Narcan) 0.01 mg /Kg IV q 2-3 minutes until respirations adequate for age or max of 0.1 mg/Kg
Morphine	0.05-0.1 mg/Kg IV over at least 5 minutes	Within 1-3 minutes	15-30 minutes, may last up to 2-4 hours	<ul style="list-style-type: none"> Narcotic analgesic Sedative effect Maximal respiratory depression within 7 minutes; with return to normal within 2-3 hours; respiratory minute volume may be subnormal for 4-5 hours. Occasionally causes pruritus after administration due to release of histamine 	Naloxone (Narcan) 0.01 mg /Kg IV q 2-3 minutes until respirations adequate for age or max of 0.1 mg/Kg
Lorazepam (Ativan)	<ul style="list-style-type: none"> 0.05-0.1 mg/Kg IV slow push or PO Not to exceed usual adult max of 2 mg per dose in adolescents 	1-2 minutes	15-30 min; Duration 2-12 hours	<ul style="list-style-type: none"> Sedative with no analgesic effect Hypotension when combined with opioids Respiratory depression when combined with opioids 	Flumazenil (Romazicon) 0.01 mg/kg (to max of 0.2 mg/ dose) IV q 2 min prn until respirations adequate. Max total dose: 1 mg.

DRUG	RECOMMENDED SEDATIVE DOSE	ONSET OF ACTION (min)	PEAK EFFECT (min) & DURATION	DRUG EFFECTS	REVERSAL AGENT
Midazolam (Versed)	<ul style="list-style-type: none"> • Infants 6 months to 5 years: 0.05-0.1 mg/Kg/dose IV over at least 5 minutes, titrate carefully; total dose of 0.6mg/kg may be required; usual dose maximum 6 mg • Children 6 to 12 years: 0.025 to 0.05mg/kg; titrate dose carefully; total doses of 0.4mg/kg may be required; usual total dose maximum: 10mg • Children >12 years: dose as adults, usual maximum total dose 10mg • PO: 0.25-0.5 mg/kg , max of 20 mg total • Not recommended for preterm infants 	1-5 minutes	5-7 minutes; duration 20-60 min Full recovery may take more than 24 hours	<ul style="list-style-type: none"> • Sedative/hypnotic prior to short procedures • Produces antegrade amnesia of perioperative events • Seizure-like reactions reported in 8% of premature infants when given continuous infusion – may also occur with rapid bolus administration or with CNS problems. • Respiratory depression or hypotension if given with narcotics or by rapid bolus 	Flumazenil (Romazicon) 0.01 mg/kg (to max of 0.2 mg/ dose) IV q 2 min prn until respirations adequate. Max total dose: 1 mg.
Diazepam (Valium)	<ul style="list-style-type: none"> • 0.05 to 0.1mg/kg over 3-5 minutes, titrate slowly to effect; maximum dose 0.25mg/kg • Lower dose when used with opiates • Not recommended for neonates 	Less than 2 min	3-4 min; duration of sedation 15-60; residual effects up to 4 hours or longer in infants	<ul style="list-style-type: none"> • Accumulation effect likely to occur in patients with congestive heart failure and liver disease. • Respiratory depression when combined with opioids. • Hypotension when combined with opioids. 	Flumazenil (Romazicon) 0.01 mg/kg (to max of 0.2 mg/ dose) IV q 2 min prn until respirations adequate. Max total dose: 1 mg.
Hydromorphone (Dilaudid)	<ul style="list-style-type: none"> • Infants >6 months weighing >10kg: 0.01mg/kg IV • Children <50kg and adolescents <50kg 0.015 mg/Kg IV to max of 2 mg/hr • Children/Adolescents ≥50kg: 0.2 to 0.6mg/dose, up to 2mg/dose • Not recommended for neonates 	Within 1-3 min	Duration of analgesia: 4-5 hours.	<ul style="list-style-type: none"> • 1.5 mg hydromorphone equal to 10 mg morphine. • Respiratory depressant effect of 1.5 mg equivalent to 10 mg morphine. 	Naloxone (Narcan) 0.01 mg /Kg IV q 2-3 minutes until respirations adequate for age or max of 0.1 mg/Kg

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