Policy Title: Caring for the Patient s Requiring Procedural Sedation Administration by Non-Anesthesia Personnel
Addendum Title: Reference Pediatric Medications: For Use with Patients under Age Twelve (12)
Addendum Letter: I
Date: 6/16/2021

All medications are titrated to effect – suggested dosages below
MR = May repeat; MAX = maximum dose

NARCOTICS
Higher doses may be used if prior exposure has shown the patient can tolerate higher doses.

AGENT	ROUTE	ONSET	DURATION	PEDIATRIC DOSE	CONSIDERATIONS	PRECAUTIONS
FENTANYL (Duragesic®, Sublimaze®) Half-life: 2-4 hrs	IV	Immediate	30-60min	Initial: 0.25 – 2.0 mcg/kg IV over 2 min (higher doses are used for major procedure) *MR* q 5min with 10 mcg increments (max 4 mcg/kg/hr)	All narcotics will potentiate the effects of benzodiazepines. May need increased dose of naloxone to reverse CNS/respiratory effects of fentanyl Give fentanyl via slow IV infusion to prevent chest wall rigidity and hypotension.	Caution in patients with asthma and/or COPD. Pregnancy/Lactation Class = B (Class D if used at term).
	Transmucosal	30 min.	30-60 min	Initial 5 mcg/kg (max 15 mcg/kg)	Administer approximately 20-40 min prior to procedure	
MORPHINE (Astro- morph®, Dura- morph®) Half-life: 3-5 hrs	IV	5 min (time to max 20 min.)	4-5 hr	Initial: 0.05-0.1 mg/kg IV over 4-5 min	ClCr 10-50ml/min: Decrease dose by 25% ClCr <10 ml/min: decrease dose by 50%	Infant <3 months of age are more susceptible to respiratory depression
	IM	30-60 min	4-5 hr	0.05-0.2 mg/kg		

BENZODIAZEPINES

AGENT	ROUTE	ONSET	DURATION	PEDIATRIC DOSE	CONSIDERATIONS	PRECAUTIONS
DIAZEPAM (Valium®) Half-life: 30-45 hrs (adults) Up to 100 hr for active metabolite	IV	2-5 min	60-120 min	0.05-0.1 mg/kg over 2 min (max 5 mg) *MR* with 0.05-0.2 mg/kg (max 2.5 mg), if needed	IM route is NOT recommended due to poor absorption and tissue irritation.	Major side effects include respiratory depression and hypotension (may be averted by administering the drug at a slower rate).

LORAZEPAM (Ativan®) Half-life: 14 hrs (adults) 15-18 hrs (children) 18 hrs (neonates)	IV	15-30 min	6-8 hr	0.05-0.1 mg/kg (max 4 mg)	Reduce dose if used in combination with narcotics. All benzodiazepines may be reversed with flumazenil.	Prior to IV administration, lorazepam injection may be diluted with an equal amount of normal saline.
	IM	2-3 min	6-8 hr	0.05-0.1 mg/kg (max 4 mg)	Same as above	
MIDAZOLAM (Versed®) Half-life: 3 hrs (adults) 2-6 hrs (children) 6-12 hrs (neonates)	IV	1-5 min	60-90 min	0.05-0.1 mg/kg over 2 min (max 10 mg)	Reduce dose if used in combination with narcotics. All benzodiazepines may be reversed with flumazenil. Intranasal administration should utilize an atomizer. Total dose may be divided into two separate doses (half of dose into each nare).	Major side effects include respiratory depression and hypotension (may be averted by administering the drug at a slower rate).
	IM	5 min (children) 15 min (adult)	60-120 min	0.05-0.1 mg/kg (max 10 mg)		
	Intranasal	1-5 min	30-60 min	0.2-0.3 mg/kg (max 10 mg)		

DEEP SEDATION/DISSOCIATIVE AGENTS Higher doses may be used if prior exposure has shown the patient can tolerate higher doses.						
AGENT	**ROUTE**	**ONSET**	**DURATION**	**PEDIATRIC DOSE**	**CONSIDERATIONS**	**PRECAUTIONS**
DEXMEDETOMIDINE (Precedex®) Half-life: 2 hrs	Intranasal	25 min	2-4 hrs	1-2 mcg/kg (max 200 mcg)	*See "Restricted Medication" list on InovaNet for IHS approved indications for use.*	
	IV	5-10 min	1-2 hrs	0.2-0.5 mcg/kg/hr to start, titrate every 10 minutes up to 1.5 mcg/kg/hr	May give loading dose of 0.5-1 mcg/kg/hr (see precautions). *See "Restricted Medication" list on InovaNet for IHS approved indications for use.*	Monitor for hypotension, bradycardia, and transient hypertension. Use with caution in patients with cardiovascular disease, hepatic impairment, and/or diabetes.
ETOMIDATE (Amidate®) Half-life: 2.6 hrs	IV	0.5-1 min	3-5 min	0.1-0.4 mg/kg over 1min	Manufacturer warning: should not be used in children less than 10 years of age due to lack of sufficient data.	Fentanyl may decrease etomidate elimination.
KETAMINE (Ketalar®) Half-life: 2.5-3.1 hrs	IV	1-2 min	5-10 min	1 – 2 mg/kg		Post-anesthetic reactions include laryngospasm and apnea.
	IM	3-8 min	10-30 min	2 – 5 mg/kg	Limited data	
PROPOFOL (Dipivan®) Half-life: 4-7 hrs (terminal)	IV	0.5-1 min	3-10 min	0.5 – 1.5 mg/kg	Dosage must be individualized based on total body weight and titrate to the desired clinical effect.	Hypotension, Use caution in severe cardiac disease patient (ejection fraction <50%)

BENZODIAZEPINE ANTAGONIST						
AGENT	**ROUTE**	**ONSET**	**DURATION**	**PEDIATRIC DOSE**	**CONSIDERATIONS**	**PRECAUTIONS**
FLUMAZENIL (ROMAZICON) Half-life: 40-80 min	IV	1-2 min. (time to max 6-10 min)	1-2 hr	Initial: 0.01 mg/kg IV over 15 sec (max initial 0.2 mg/dose) *MR* every 1 min with half the original dose (max 0.2 mg/dose given over 1 minute to a max total of 1 mg)	Observe for a minimum of 90 min (possible reversal may wear off and patient may become sedated)	Caution in patients with history of seizures or those dependent on benzodiazepines.

NARCOTIC ANTAGONIST						
AGENT	**ROUTE**	**ONSET**	**DURATION**	**PEDIATRIC DOSE**	**CONSIDERATIONS**	**PRECAUTIONS**
NALOXONE (NARCAN) Half-life: 60-90 min	IV	1-2 min (time to max 6-10 min)	1-4 hr	Initially: 0.1 mg/kg IV over 15 sec *MR* every 2-3 min to a max of 10 mg *Note:* 1 mg generally provides a safe single dose for and emergent situation	Observe for a minimum of 90 min (possible reversal may wear off and patient may become sedated). Titrate to avoid excessive reduction in analgesia	Caution in those dependent on narcotics. May need higher dosing for reversal of fentanyl. May not fully reverse cardiovascular effects of narcotics. Naloxone associated non- cardiogenic pulmonary edema has been reported throughout the dosing range (no direct cause-and-effect relationship).