

AGENT	Sedation	Induction	Maintenance (IV)
Midazolam	0.01-0.05 mg/kg 0.05-0.1 mg/kg IM 0.5-1 mg/kg PO	0.1-0.4 mg/kg	0.25-1 mcg/kg/min
Propofol	0.5-1 mg/kg	1.5-2.5 mg/kg	50-200 mcg/kg/min
Thiopental	1-2 mg/kg	3-6 mg/kg	2-6 mg/kg/hr
Etomidate		0.2-0.5 mg/kg	
Ketamine	0.25-0.5 mg/kg 1 mg/kg PO	1-2 mg/kg 5-10 mg/kg IM	1-2 mg/kg/hr
Dexmedetomidine			0.2-0.7 mcg/kg/hr
Scopolamine	0.05 mg/kg		
Diphenhydramine	0.5 mg/kg		

IV OPIOIDS	Sedation	Loading	Induction	Maintenance
Morphine	0.05-0.2 mg/kg	0.2-0.5 mg/kg	1-3 mg/kg	0.05-0.1 mg/kg/hr
Fentanyl	1-2 mcg/kg	2-5 mcg/kg	15-40 mcg/kg	1-2 mcg/kg/hr
Remifentanyl	0.02-0.2 mcg/kg/min	0.5-5 mcg/kg		0.05-2 mcg/kg/min
Sufentanil	0.1-0.3 mcg/kg	0.25-2 mcg/kg	2-20 mcg/kg	0.3-1.5 mcg/kg/hr

PARALYTICS	Clearance	Intubating	Duration	Maintenance
Succinylcholine	Pseudo	0.6-2 mg/kg 3-4 mg/kg IM	5-10 min	
Vecuronium	Liv>>Kid	0.1 mg/kg	20-35	0.05-0.07 mg/kg/hr
Rocuronium	Liv>>Kid	0.6-1.2 mg/kg	20-35	0.6-0.7 mg/kg/hr
Cisatracurium	Hoffman	0.15 mg/kg	20-35	0.06-0.18 mg/kg/hr
Pancuronium	Kid>>Liv	0.1 mg/kg	60-90	0.01-0.03 mg/kg/hr

VASOACTIVE AGENTS		Bolus / Loading (Typical)	Mix in 250cc (Concentration)	Maintenance
Atropine	mACh	0.5-1 mg		
Ephedrine	β>α1	0.1 mg/kg (5-10 mg)		
Phenylephrine	α	1 mcg/kg (50-200 mcg)	20mg (80 mcg/mL)	0.1-1.0 mcg/kg/min
Dopamine	D1>β1>α		400 mg (1.6 mg/mL)	2-20 mcg/kg/min
Norepinephrine	α>β1	0.1 mcg/kg (10-50 mcg)	4 mg (16 mcg/mL)	0.05-0.5 mcg/kg/min
Epinephrine	β>α	0.1-10 mcg/kg (5-100 mcg)	4 mg (16 mcg/mL)	0.01-0.5 mcg/kg/min
Vasopressin	V1>V2	0.01-0.05 U/kg (0.5-2 U)	40 U (0.16 U/mL)	0.02-0.1 U/kg/hr
Dobutamine	β		250 mg (1 mg/mL)	2-30 mcg/kg/min
Milrinone	PDEI	50 mcg/kg	50 mg (200 mcg/mL)	0.375-0.75 mcg/kg/min
Isoproterenol	β	0.5-1 mcg/kg (20-60 mcg)	2 mg (8 mg/mL)	0.01-0.1 mcg/kg/min
Labetalol	β>α1	0.1-0.25 mg/kg (5-10 mg)		q 2-6 hr
Metoprolol	β1>β2	0.01-0.3 mg/kg (1-10 mg)		q 4-8 hr
Esmolol	β1>β2	0.25-1 mg/kg (20-50 mg)	2500 mg (10 mg/mL)	0.05-0.2 mg/kg/min
Propranolol	β	0.005-0.01 mg/kg (0.5-1 mg)		
Hydralazine	GC	0.03-0.07 mg/kg (2.5-5mg)		
Nitroglycerin	NO	0.5-1.5 mcg/kg (25-100 mcg)	100 mg (400 mcg/ml)	0.5-8 mcg/kg/min
Nitroprusside	NO	0.5-1.5 mcg/kg (25-100 mcg)	50 mg (200 mcg/mL)	0.5-8 mcg/kg/min
Nicardipine	CCB	0.25-0.5 mg	25 mg (100 mcg/mL)	5-15 mg/hr
Phentolamine	α	10-70 mcg/kg (1-5 mg)		1-30 mcg/kg/min
Fenoldopam	D1			0.1-1.0 mcg/kg/min
Enalaprilat	ACEI	0.625-1.25 mg		
Nitric Oxide	NO			2-80 ppm
Adenosine	AC	6 / 12 / 12 mg		
Diltiazem	CCB	15-20 / 20-25 mg		5-15 mg/hr
Amiodarone	CCB/BB	150-300 mg		60 mg/hr → 30 mg/hr
Verapamil	CCB	2.5-5 mg		
Digoxin	SPA	0.5 → 0.25 → 0.25 mg		
Lidocaine	SCB	50-100 mg		60-240 mg/hr

INHALED AGENTS	MAC (Adult @ 1 atm)	Blood: Gas	Fat:: Blood
Halothane	0.8%	2.4	60
Isoflurane	1.2%	1.4	45
Sevoflurane	2%	0.65	48
Desflurane	6%	0.42	27
Nitrous Oxide	105%	0.47	2.3

ANTIEMETICS	Dose	ASPIRATION PROPHYLAXIS	Dose
Ondansetron	4 mg IV	Sodium Citrate	30 mL
Dexamethasone	4-10 mg IV	Famotidine	20 mg
Prochlorperazine	5-10 mg IV	Metoclopramide	10 mg
Droperidol	0.625 mg IV		
Scopolamine	1.5mg TD		

OTHER AGENTS	Dose
Glycopyrrolate	0.01-0.015 mg/kg
Neostigmine	0.04-0.08 mg/kg
Physostigmine	0.01-0.03 mg/kg
Naloxone	0.04-0.4 mg → 0.1-1.0 mg/hr
Flumazenil	0.1-0.3 mg → 0.3-0.5 mg/hr
Calcium Chloride/Gluconate	5-15 mg/kg / 15-30 mg/kg
Magnesium Sulfate	15-25 mg/kg
Dextrose	0.5-1 g/kg
Glucagon	1 mg IV/IM
Octreotide	50-100 mcg/hr
Sodium Bicarbonate	0.5-1 meq/kg
Phenytoin	10-20 mg/kg
Mannitol	0.25-2 g/kg
Methylene Blue	2 mg/kg → 0.5 mg/kg/hr
Terbutaline	0.25 mg SC
Methylergonovine	0.2 mg IM
Carboprost	250 mcg IM
Oxytocin	10-40 U IVSS
Albuterol	2.5 mg nebulized
Ipratropium	0.25 mg nebulized

LOCAL ANESTHETICS	Duration (hrs)			Max Dose (mg/kg) (+Epi = 1:200k=5 mcg/mL)	CVS: CNS Toxicity
	Spinal	Epidural	Peripheral		
Chloroprocaine 2-3%	1-1.5	0.5-1.5	-	12	4
Lidocaine 1-2%	1-1.5	1.5-2.5	2-4	4.5 (7)	7
Mepivacaine 1-1.5%	1-1.5	1-3	3-5	4.5 (7)	7
Bupivacaine 0.25-0.75%	1-3	3-5	6-12	3	2
Ropivacaine 0.2-1%	-	2-6	5-8	3	2
Tetracaine 1%	2-6	-	-	3	

ANALGESICS	Equianalgesics	Adult Initial Dose
Morphine	10 mg IV 30 mg PO	4-15 mg IV q 3-4 hr 5-20 mg PO q 3-4 hr 4 mg EPI 0.25 mg IT
Fentanyl	0.1 mg IV	50-150 mcg IV q 1 hr 100 mcg EPI 25 mcg IT
Hydromorphone	1.5 mg IV 7.5 mg PO	0.2-0.6 mg IV q 2-4 hr 2-4 mg PO q 4-6 hr 1 mg EPI 0.15 mg IT
Methadone	10 mg IV 20 mg PO	2.5-10 mg IV q 3-6 hr 2.5-10 mg PO q 3-12 hr
Hydrocodone	30 mg PO	5-10 mg PO q 4-6 hr
Oxycodone	20 mg PO	5-15 mg PO q 4-6 hr
Codeine	200 mg PO	30-60 mg PO q 4-6 hr
Meperidine	75 mg IV	12.5-25 mg IV for shivering
Acetaminophen	1000 mg PO/IV	500-1000 mg PO/IV q 4-6 hr
Ketorolac	30 mg IV	15-30 mg IV q 6 hr
Ibuprofen	800 mg PO	400-800 mg PO q 6-8 hr

COMBO ANALGESICS	
Vicodin	Acetaminophen 325 + Hydrocodone 5 PO q4hr
Percocet	Acetaminophen 325 + Oxycodone 5 PO q 4 hr
Tylenol #3	Acetaminophen 325 + Codeine 30 PO q 4 hr

STEROIDS	Equivalents
Hydrocortisone	20 mg
Prednisone	5 mg
Methylprednisolone	4 mg
Dexamethasone	0.75 mg

PATIENT-CONTROLLED ANALGESIA	
IV Morphine	1.4mg q 8 min [+/- 1 mg/hr]
IV Fentanyl	18 mcg q 8 min [+/- 10 mcg/hr]
IV Hydromorphone	0.2mg q 8 min [+/- 0.1 mg/hr]
Epidural	[Fentanyl 5 mcg/mL+ Bupivacaine 0.1%] @ 6 mL/hr + 2mL q 20 min PRN
Peripheral Nerve Block	[Bupivacaine 0.1%] @ 8 mL/hr + 2 mL q 30 min PRN

FLUID MANAGEMENT	
Maintenance	(kg wt + 40) mL/hr
Deficit	Time NPO x Maintenance Replace 1/2 in 1st hr, 1/4 in 2nd & 3rd hr
Blood Loss & Replacement	Lap Pad = ~100mL / Sponge = ~15mL 1:1 Colloid (RBC, FFP, HES, Albumin) 3:1 Crystalloid
Insensible Loss	3-9 mL/kg/hr
Urine Output	0.5-1 mL/kg/hr
Fluid Composition	LR - 130 Na/109 Cl/4 K/3 Ca/28 Lactate PLA - 140 Na/98 Cl/5 K/3 Mg/23 Gluconate NS - 154 Na/154 Cl
Estimated Blood Vol	60-75 mL/kg
Allowable Blood Loss	(HctStart-HctLimit) x EBV / HctStart
PRBC Transfusion Volume	(HctGoal-HctNow) X EBV / 0.7
Ideal Body Weight	IBW=50 ♂/45 ♀ kg + 2.3 kg per inch >5'
Lean Body Weight	LBW=(kg - IBW) x 25% + IBW
Body Surface Area	BSA= (cm * kg / 3600) ^{1/2}
Body Mass Index	BMI= (kg weight) / (m height) ²

COAGULATION	Dose
Desmopressin	0.3 mcg/kg IV
Protamine	1mg IV per 100 U Heparin
Aminocaproic Acid	75-150 mg/kg → 15-30mg/kg/hr
Tranexamic Acid	10 mg/kg → Repeat in 3 hrs 10 mg/kg → 1 mg/kg/hr
Factor 7a	90 (30-120) mcg/kg Q3-6hr
Heparin	80 U/kg → 15 U/kg/hr

INSULIN	Onset / Peak / Duration
Aspart/Lispro/ Glulisine (SC)	15min / 1hr / 4hr
Regular (SC)	20min / 2hr / 6hr
Regular (IV)	1min / 3min / 15min
NPH (SC)	2hr / 8hr / 21hr
Glargine/Detemir (SC)	4hr / 12hr / 20hr

ANTICOAGULANTS	Drug-Free Days Prior	to Neuraxial Block
Heparin IV - 4 hr	Rivaroxaban - 3 to 7	Clopidogrel - 7
Enoxaparin - ½ to 1	Ticagrelor - 5	Prasugrel - 7 to 10
Apixiban - 2	Dabigatran - 5 to 7	Ticlopidine - 14

EMERGENCY PROTOCOLS	Immediate Treatment Options to Consider
Difficult Ventilation/ Intubation	call for help (anesthesia, ENT), consider awakening patient, change position/practitioner/device (blade, fiberscope, Glidescope, LMA, FasTrach), cricothyrotomy
Anaphylaxis	epinephrine 0.5mg SC (or IV dosing PRN), hydrocortisone 100mg, diphenhydramine 50mg, famotidine 20mg, albuterol, vasopressin, glucagon, blood sample for tryptase
Malignant Hyperthermia	Hyperventilate 100% O ₂ , dantrolene 2.5-10mg/kg, cooling, hydration, NaHCO ₃ , glucose/insulin/ CaCl ₂ , 1-800-MH-HYPER
Hemolytic Transfusion Reaction	stop xfusion, hydration, NaHCO ₃ , vasopressors PRN, steroids, retain blood and pt sample for analysis
Pulseless Ventricular Tachycardia/ Ventricular Fibrillation	CPR (30 compress [100+/min]; 2 vent [8-10 with ETT]) 200J biphasic (360J mono) defibrillation X1 continue 5 cycles (2 min) CPR + 1 shock epinephrine 1 mg q 3-5min, vasopressin 40U X1 amiodarone 300/150mg lidocaine 100 mg X2 consider NaHCO ₃ , MgSO ₄ , CaCl ₂
Asystole PEA	continuous CPR epinephrine 1mg q 3-5min, vasopressin 40U X1 consider NaHCO ₃ , CaCl ₂
Post-Resuscitation	avoid hyperthermia/hyperventilation/ hyperglycemia consider hypothermia to 32-34°C consider continued antiarrhythmics
Tachycardia	synchronized cardioversion 50-200J if unstable <i>Narrow complex:</i> adenosine 6/12 mg, esmolol/ metoprolol/diltiazem/verapamil/digoxin/ amiodarone <i>Wide complex:</i> amiodarone 150mg, MgSO ₄ 1-2g
Bradycardia	atropine 0.5mg (3mg max), dopamine, epinephrine, isoproterenol, transcutaneous/transvenous pacing
Myocardial Ischemia	O ₂ , aspirin, β-blocker, NTG, morphine cardiology evaluation for possible intervention
CHF/Edema	O ₂ , furosemide, morphine, NTG, NTP, milrinone/ dopamine, IABP, BiPAP
Asthma COPD	O ₂ , albuterol, ipratropium, steroids, terbutaline, epinephrine, MgSO ₄ , BiPAP, volatile anesthetics
Stroke	O ₂ , treat hyperglycemia & severe hypertension, neurology consult for CT scan and medical/ surgical intervention
Seizures	midazolam, propofol/thiopental, phenytoin, GA, MgSO ₄ (for eclampsia)
Hypertensive Emergency	10-20% BP reduction with NTP, nicardipine, labetalol
Hyperkalemia	CaCl ₂ , insulin/dextrose, NaHCO ₃ , hyperventilation, β-agonists, dialysis, kayexalate
Tension Pneumothorax	Large bore needle decompression in midline of hemithorax at level of sternal angle with needle to 1-7 cm depth, chest tube thoracostomy
Fetal Distress	O ₂ , reposition mother, ephedrine/phenylephrine (for hypotension), NTG + stop oxytocin (for uterine tetany), pelvic exam, instrument/surgical delivery
Local Anesth Toxicity	20% IV fat emulsion 1.5 mL/kg → 0.25 mL/kg/ min X 30-60 minutes