UNIVERSITY of MARYLAND
UPPER CHESAPEAKE MEDICAL CENTER

ADULT I.V. PUSH MEDICATIONS

LEVEL OF CARE:

CDU	CDU	Unit with patient on continuous telemetry monitoring (UCMC & HMH)
Critical care units	CC	Nursing units equipped to provide continuous ventilator and cardiac support and intervention, these include ICUs, OR, ED, PACU, CV Lab, CCE
IMC	IMC	Nursing units equipped to provide continuous cardiac monitoring and support.
Cardiac/Telemetry	C-T	Nursing units equipped to provide continuous cardiac monitoring and support-designated as Cardiac Unit with Telemetry: CDU (1W), 3E, 3ET, 3S, Med/surg Flex Unit
Med-Surg/Telemetry	MS-T	Nursing units with patient on continuous Telemetry Monitoring: 3W, 2W, 4T, 3T
CVPR	CVPR	
Med-Surg	MS	General Nursing Units
Family Birth Place	FBP	FBP

GENERIC NAME (BRAND NAME)	UNIT SPECIFICATION	DRUG CLASS	IVP RATE	MAXIMUM SINGLE DOSE	DILUTIONS	MONITORING CONSIDERATIONS	ADVERSE REACTIONS/COMMENTS
Acetazolamide (Diamox)	CC, IMC	Diuretic	250-500 mg/min	1g	Dilute to 100 mg/mL solution with sterile water	BP, BMP, CO2 urine output	Hypotension; dilute with sterile water
Adenosine (Adenocard)	Any unit during Code Blue A or rapid response CC, IMC, C-T	Antiarrhyth-mic, vasodilator	SVT- Over 1-2 seconds, flush line with NS	12 mg	Do not dilute Flush each dose with 20 mL for adults.	**Heart monitor must be in room when administering**, monitor ECG, HR, BP	Chest pain, flushing common
Alteplase (Activase)	CC Exception: (Doses for catheter occlusion may be administered at any level of care)	Thrombo-lytic Agent	2 mins	For Catheter occlusion--2 mg For Code Blue--100 mg For Acute Ischemic Stroke--9 mg	Dilute in equal volume of 0.9% sodium chloride or D5W to yield a final concentration of 0.5 mg/mL	For catheter occlusion: Assess catheter function after 30 min dwell time by attempting aspirate blood. If not functional, let dwell for total 120 min. If not functional, repeat dose x 1 For all patients: Signs of external bleeding at venipuncture sites signs of internal bleeding (hypotension, hematuria, hematemesis, melena), CBC, aPTT, angioedema is rare For ischemic stroke: Neurological assessment and check BP q 15min during infusion and q 30min for next 6 hrs, then q1h until 24 h post treatment; ↑ frequency if patient hypertensive (SBP >180 mmHg or DBP >105 mmHg) If patient experience severe headache,	Hypotension, Fever

						nausea or vomiting, notify HO and BAT team immediately.	
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Amiodarone (Cordarone)	ANY UNIT DURING CODE BLUE A	Antiarrhyth-mic	Initial: 300 mg rapid bolus; if pulseless VT or VF continues after subsequent defibrillation attempt or recurs, administer supplemental dose of 150 mg	300 mg	May be diluted in 20-30 cc D5W	HR, BP, ECG (QTc) ***Loading dose is given in a setting with continuous cardiac monitoring***	Hypotension, arrhythmias, contraindicated in pregnancy
Atropine	Any unit during Code Blue A or rapid response, CC, C-T, IMC	Anticholin-ergic	Rapid IVP	1 mg	Do not dilute	Continuous cardiac monitoring, HR, BP, mental status. May be ineffective in heart transplant patients.	Do not give less than 0.5 mg
Benztropine (Cogentin)	ALL	Anticholin-ergic	Over 1 min	2mg	Do not dilute	HR	Anti-cholinergic side effects
Bumetanide (Bumex)	ALL	Diuretic	1-2 min	1 mg	Do not dilute	BP, BMP, CO2, urine output	Ototoxicity, ↓BP, ↓ electrolytes, ↑ glucose, metabolic alkalosis
Calcium chloride	ANY UNITS DURING CODE BLUE A **Any units for hyperkalemia with EKG changes**	Electrolyte	Over 2-5 min	1000 mg	Do not dilute-ADMINISTER THROUGH LOWEST Y-SITE OF RAPIDLY RUNNING FLUID	Continuous cardiac monitoring during rapid infusion, serum Ca, and/or ionized Ca may be rechecked after repletion,;	Cardiac arrest/hyperkalemia, EMERGENCY ONLY, if non-emergent condition, use Calcium Gluconate as an infusion. May cause hypophosphatemia. **-CENTRAL LINE ONLY for hyperkalemia with EKG changes**
Calcium Gluconate	All units during Code Blue A **Any units for hyperkalemia with EKG changes**	Electrolyte	Over 5-10 min	1000 mg	Do not dilute	continuous cardiac monitoring during rapid infusion, serum Ca, and/or ionized Ca may be rechecked after repletion	Arrhythmia, bradycardia, cardiac arrest, hypotension, vasodilation, and syncope may occur following rapid I.V. injection
Cisatrocorium (Nimbex)	CC	Paralytic	Over 1-2 min	0.2 mg/kg Use Ideal Body Weight (IBW) in obese patients	Do not dilute	Train of 4 via peripheral nerve stimulation. BP, HR, RR, BMP. Utilize in conjunction with adequate sedation and/or analgesia. Mechanical Ventilation is required.	Paralysis, neuromuscular blocker, must have full ventilator support at all times Ideal Body Weight (IBW) may be used on obese patients for dose calculation
Cosyntropin	ALL	Diagnostic	Over 2 min	250 mcg	Reconstitute with diluent provided. Reconstitute 250mcg mg with NS 2-5 mL if diluent not available.	Monitor HR, BP. Observe patients twice (15 min apart) for the first 30 min after injection for possible allergic reaction. Observe frequently thereafter. Monitor BP.	Monitor for anaphylaxis
Dantrolene (Dantrium)	OR, ICU, FBP PACU, RAD ONC?	Skeletal Muscle Relaxant	1 min	2.5mg/kg	Reconstitute vial with 60 mL sterile water for injection without a bacteriostatic agent	Motor function (rigidity), RR, HR, BP for 24 hours; Creatinine Kinase; Max total dose = 10 mg/kg/day	Dantrolene, Flushing, Dyspnea
Dexamethasone (Decadron)	ALL	Cortico-steroid	Over 3 - 5 Min	20mg	Do not dilute	BMP, Glucose, BP. May mask signs of infection.	
Dextrose (D50%)	ALL	Simple sugar	steady push over	25 g	Do not dilute		Rapid fluid and electrolyte shift, see

			1 min				hypoglycemia protocol
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Diazepam (Valium)	ALL	Benzodiaze-pine	5 mg/min	10 mg	Do not dilute ADMINISTER THROUGH LOWEST Y-SITE OF RAPIDLY RUNNING FLUID	RR, HR, BP, sedation. Effects reversed by flumazenil	Use in large vein; monitor for extravasation, ↓RR, ↓BP
Digoxin (Lanoxin)	CCCDU, IMC, C-T, MS-T, MS	Digitalis glycoside	0.25 mg/ 5 min	0.5 mg/ 5 min	Can be administered undiluted or diluted with 10mL of NS. May be administered undiluted or diluted fourfold in D5W, NS, or SWFI for direct injection. Less than fourfold dilution may lead to drug precipitation. (Lexicomp)	Apical pulse, HR, BP, baseline, continuous cardiac monitoring, BMP (K, Mg, Ca), serum digoxin levels ***Loading dose is given in a setting with continuous cardiac monitoring, monitor HR for minimum 30 minutes after loading dose***	Bradycardia, hypokalemia, electrolyte imbalances potentiate toxicity
Diltiazem (Cardizem)	CC, CDU, IMC, C-T	Calcium channel blocker	2 min	0.35 mg/kg	Do not dilute	HR, BP, baseline ECG ***Loading dose is given in a setting with continuous cardiac monitoring, monitor HR for minimum 30 minutes after loading dose***	↓ BP, ↓ HR
Diphenhydramine (Benadryl)	ALL	Antihist-amine	25 mg/min	50 mg	Do not dilute		↓ U/O, delirium in elderly
Droperidol (Inapsine)	CC	Neuroleptic, antiemetic	Over 2-5 min	0.625-2.5 mg	Do not dilute	EKG, vital signs, monitor for QTc prolongation (consider checking EKG prior to dose and continue for 2-3 hours after completing treatment), monitor for symptoms of EPS (e.g., dystonia)	Black Box Warning=Cases of QT prolongation and torsade de pointes, including some fatal cases, have been reported.
Enalaprilat (Enalapril)	CC, IMC	Ace-inhibitor	0.625 mg-1.25 mg/5min	1.25 mg	Do not dilute	Monitor K+, SCr – Continuous cardiac monitoring; monitor BP every 15 minutes for 30 minutes after administration	↓ BP, marked hypotension, slower administration in patients at risk of hypotension (i.e, CHF, AMI, diuretics)
Epinephrine (Adrenaline)	Any units during a code blue A.	Sympatho-mimetic	Rapid IV push.	1 mg		BP, HR, RR	
Eptifibatide (Integrilin)	CC, IMC, C-T, CVPR,	Antiplatelet Agent	1 to 2 mins	22.6 mg	Do not dilute	Monitor for Hgb/Hct, and platelets. Dose adjustments based on renal function. Maximum infusion rate based on weight and renal function. Actual body weight should be used to calculate creatinine clearance and the medication dose.	Hypotension, Thrombocytopenia, Bleeding
Etomidate	CC CODE BLUE	General	30 to 60 secs	0.6mg/kg	Do not dilute	Monitor for BP, HR, Respiratory	Injection site pain, Adrenal Suppression

(Amidate)	A	Anesthetic				Rate, and sedation. May be given undiluted; avoid administration into small vessels.	
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Famotidine (Pepcid)	ALL	H2 antagonist	2 min	20 mg	5-10 mL NS	None	H/A, N/V
Fentanyl (Sublimaze)	ALL	Narcotic analgesic	Over 2 min	2mcg/kg	Do not dilute (small doses) or may dilute with 5 mL NS 0.9% or sterile water for injection	Assess at baseline and peak effect : BP, HR, RR	Use with caution in patients with BMI >40
Flumazenil (Romazicon)	All units during code Blue A or rapid response, CC	Benzodiaze-pine antidote	Over 15-30 sec	1 mg	Do not dilute	Monitor BP, HR, and RR closely. ECG and pulse oximetry are recommended. Observe continuously for re-sedation and respiratory depression for an appropriate period (2 or more hours).	Duration of action is shorter than benzodiazepines, monitor for sedation, ↑ seizure risk
Furosemide (Lasix)	ALL	Diuretic	20 mg/min	1 mg/kg up to 120 mg	Do not dilute	BP, BMP, CO2, urine output	Ototoxicity, ↓BP, ↓ electrolytes, ↓ fluid volume
glucagon	ALL	Antidote	5-10 mg/min	10 mg	Reconstitute with1mL of sterile water.	Monitor HR, BP, RR, blood glucose	Hypotension, hypertension, nausea, vomiting **Rapid injection may be associated with increased N/V; place patient in lateral recumbent position to protect airway and to prevent choking when consciousness returns.
Haloperidol (Haldol)	ALL	Antipsych-otic	5mg/min.	10 mg	5-10 mL NS	Resolution of agitation and delirium. Obtain baseline ECG prior to treatment. Monitor for EPS, sedation and BP. Doses >/= 35 mg per day have increased risk of QTc prolongation. Monitor ECG.	↓ BP, EPS (dystonia, rigidity, tremors), potential for QT prolongation Non-ICU = 35 mg/day, PRN only
Heparin	ALL	Anticoag-ulant	5,000 units/min	Per protocol	Do not dilute	Monitor PTT	Prolonged bleeding time
Hydralazine (Apresoline)	CCCDU IMC, C-T, MS-T, FBP	Anti-hypertensive	10 mg/min	20 mg	Do not dilute	– Monitor BP every 10 minutes for 20 minutes after administration. – May need more frequent BP monitoring based on clinical situation.	Angina, MI, ↓ BP, additive with meds, ↓CPP, caution in CVA or with epinephrine
Hydrocortisone (Solu-cortef)	ALL	Cortico steroid	100mg/30sec ; 200mg/min);	200 mg		BP, electrolytes, blood glucose, edema may mask signs of infection	
Hydromorphone (Dilaudid)	ALL	Narcotic analgesic	0.5mg/min	2 mg	Do not dilute	Assess at baseline and peak effect :HR, BP, RR Effects reversed by naloxone. Please see naloxone section for more information.	Note: 7-8 times more potent than morphine. Use with caution in patients with BMI >40 ↓RR, ↓ HR, ↓ BP
Insulin Regular	ALL	Hormone	Over 10 sec	(30units)	Central line – Draw up dose in insulin syringe. Dilute in 10mL normal saline flush syringe. Peripheral line – Draw up dose in insulin	Monitor electrolytes and glucose	

					syringe. Dilute in 3mL normal saline flush syringe.		
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Ketamine (Ketalar)	CODE BLUE A, The RN may only administer Ketamine IV push for RSI when the prescribing physician is present performing the procedure with both hands engaged. In this instance the RN is acting only in the capacity of a second pair of hands.	General Anesthetic	Over 2 mins	2 mg/kg	The 50 mg/mL and 100 mg/mL vials may be diluted in D5W or NS to prepare a maintenance infusion with a final concentration of 1 mg/mL (or 2 mg/mL in patients with fluid restrictions)	Monitor for sedation score, RR, BP, and HR every 15 mins for 1st hour, then q1h; may increase oral secretions.	Hypertension, Tachycardia, Emergence from anesthesia.
Ketorolac (Toradol)	ALL	NSAID	Administer IV bolus over a minimum of 15 seconds (Lexicomp).	30 mg	Do not dilute	BP	GI bleed, ↑ BP, edema, renal toxicity Max daily dose for <65 years old = 120 mg; ≥ 65 years old, < 50 kg, or renally impaired = 60 mg. Renal function, BP, LFTs, urine output, CBC. Maximum duration 5 days due to risk of GI bleed.
Labetalol (Normodyne)	CC, CDU, IMC, C-T, MS-T, FBP	Anti-hypertensive	10 mg/min **FBP**= 10-20 mg/min	40 mg Additional doses of may be given at 10 minute intervals until desired BP is achieved or up to a total of 300 mg **FBP**= 80mg/dose Max cumulative dose = 220mg/24hr per order set and ACOG	Do not dilute	Continuous cardiac monitoring (except FBP): HR, BP every 15 minutes for 30 minutes after administration	↓ BP, ↓ HR
Levothyroxine (Synthroid)	ALL	Thyroid replacement	50 mcg/min	200 mcg	Reconstitute as directed; dilute with 5cc NS	HR, BP, TFTs	Tachyarrhythmias. Use immediately after reconstitution (fluid not stable-product is only stable for 4 hours. Discard unused portion.
Lidocaine	CC, Code Blue A	Antiarrhyth-mic	Code Blue A-seconds; Non-Code- 25-50 mg/min	1.5 mg/kg	Do not dilute	HR, BP, ECG, mental status,	
Lorazepam (Ativan)	ALL	Benzodiaze-pine	2 mg/min	4 mg	Dilute with equal volume of NS Mix thoroughly by gently inverting the container until homogenous; do not shake vigorously (Micromedex).	Sedation, RR, BP, HR	↓ RR, apnea

Magnesium	Code Blue A	Electrolyte	Over 1 to 2 minutes	2 g	Dilute with equal volume of NS or D5W	HR, BP, ECG	IVP-Emergency Use Only If non-emergent replacement, use infusion
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Meperidine (Demerol)	CC, 2W, , FBP	Narcotic analgesic	Over 2-5 min	50 mg	IV push should be administered using a diluted solution, use of a 10 mg/mL concentration has been recommended (Lexicomp)	Assess at baseline and peak effect :HR, BP, RR Effects reversed by naloxone. Please see naloxone section for more information.	Restricted to drug-induced rigors/consult with pharmacist. Caution in patients with renal dysfunction-seizure risk. Monitor for twitching, jerking, shaky hands, tremors
Methyl-prednisolone Sodium Succinate (Solumedrol)	ALL	Cortico-steroid	40 mg/min	125 mg		BP, electrolyte changes, serum/blood glucose, edema; may mask signs of infection	
Metoclopramide (Reglan)	ALL	Anti-emetic	2 min	10 mg	Do not dilute	Sign and symptoms of tardive dyskinesia (or other extrapyramidal symptoms), mental status, improvement in nausea/vomiting	Anxiety, restlessness, drowsiness, EPS
Metoprolol (Lopressor)	CC, FBP, IMC, CDU	Beta-blocker	5 mg/min	5 mg	Do not dilute	Continuous cardiac monitoring: **Bedside monitor required**. HR, BP every 15 minutes for 30 minutes after administration.	
Midazolam (Versed)	CC	Benzodiaze-pine	Over 2 min	2 mg	Do not dilute	HR, BP, RR, mental status. May be prolonged effects in elderly, renal or hepatic dysfunction.	Moderate sedation policy, see RSI guidelines for intubation
Morphine (Morphine)	ALL	Narcotic analgesic	1 mg/min	10 mg	Do not dilute	Assess at baseline and peak effect :HR, BP, RR Effects reversed by naloxone. Please see naloxone section for more information	↓RR, ↑HR, ↓BP; Use with caution in patients with BMI >40
Naloxone (Narcan)	ALL	Opioid antagonist	30 sec	2 mg If using 0.4 mg diluted with 9 ml NS (0.04mg/ml): • 0.1mg (2.5ml) increments at a time (see comments)	• Dose 2mg: Do not dilute • Dose 0.4mg: dilute 0.4 mg (0.4mg/1 ml) in a syringe with 9 ml NS to a final concentration of 0.04mg/ml	Monitor RR, HR, BP, and/or arrhythmia, reversal of opioid effects including s/s of opioid withdrawal (HTN, tachycardia, diaphoresis, flu-like symptoms, anxiety, restlessness). May repeat doses. Naloxone is NOT a harmless medication - cause serious life-threatening side effects such as: flash pulmonary edema, significant arrhythmias, hypertension, seizures, cardiac arrest, and reversal of opioid analgesic effects	↑RR, ↑HR, ↑BP, high doses ↑VT/VF, Opioid may outlast Naloxone, see Narcan pathway and/or PCA pathway Start with low dose 0.1 mg (2.5 ml – see dilution) increments at a time for a total of 0.4 mg (10ml) over 2 min if opioid-related sedation and respiratory depression or post-op
Ondansetron (Zofran)	ALL	Anti-emetic	Over 2 min	4 mg	Do not dilute	HR, BP after to monitor for orthostatic hypotension - ambulate slowly; ECG if electrolyte abnormality or QT prolongation	
Pantoprazole (Protonix)	ALL	Proton Pump Inhibitor	2 min	40 mg	10 mL NS	Headache	

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Phenobarbital (Luminal)	CC	Barbiturate	60 mg/min	200 mg	Do not dilute	BP, RR	IV route usually reserved for critical situations and preferred in patients with a protected airway since it can cause significant respiratory depression with repeated dosing. Use caution in elderly and those with impaired renal or hepatic function.
Prochlorperazine (Compazine)	ALL	Anti-emetic	5 mg/min	10 mg	Do not dilute	BP	↓BP, EPS (dystonia, rigidity, tremors)
Propofol (Diprivan)	**Nurses in Maryland Per Board of Nursing Cannot Administer I.V. Push**						
Rocuronium	CC	Paralytic	Over 1-2 min	1.2 mg/kg	Do not dilute	Train of 4 via peripheral nerve stimulation. BP, HR, RR, BMP. Utilize in conjunction with adequate sedation and/or analgesia.. Mechanical Ventilation is required.	Paralysis; neuromuscular blocker, must have full ventilator support at all times
Sodium Bicarbonate	CC Code Blue A **Any units for hyperkalemia with EKG changes**	Alkalinizing agent	Over 5-30 seconds	1 mEq/kg	Do not dilute	Electrolytes. ABG. Signs and symptoms of fluid retention, RR	Do not mix with Calcium products or Catecholamines, flush line before and after administration with NS
Succinylcholine	CC	Paralytic	Seconds May be administered undiluted by rapid IV injection (Lexicomp).	2 mg/kg Intubation: 0.6 mg/kg (range: 0.3 to 1.1 mg/kg). Intubation (rapid sequence) (off-label dosing): 1 to 1.5 mg/kg Long surgical procedures (intermittent IV): Initial 0.3 to 1.1 mg/kg. (Lexicomp).	Do not dilute	Train of 4 via peripheral nerve stimulation. BP, HR, RR, BMP. Utilize in conjunction with adequate sedation and/or analgesia.. Mechanical Ventilation is required.	Paralysis; neuromuscular blocker, must have full ventilator support at all times. Hyperkalemia is contraindicated
Thiamine (Vitamin B1)	ED Only, All other floors administer in I.V. Mini-Bag	Vitamin	Over 5 min	100 mg	Do not dilute	HR, BP, RR, contains aluminum-may develop a hypersensitivity or life-threatening anaphylactic reaction to thiamine, especially after repeated injections	Given prior to glucose as I.V. push to avoid Wernicke's Encephalopathy
Vasopressin	CC, Code Blue A	Hormone	Rapidly	40 units	Do not dilute	Monitor ECG, HR, BP	
Vecuronium (Norcuron)	CC	Neuromus-cular blocker	Over 1-2 min	0.1 mg/kg, Max 10 mg	Dilute vial with 10 mL of NS/sterile water 1 mg/mL	Train of 4 via peripheral nerve stimulation. BP, HR, RR, BMP. Utilize in conjunction with adequate sedation and/or analgesia.. Mechanical Ventilation is required.	Neuromuscular blocker, must have full ventilator support at all times
Verapamil (Calan)	Code Blue A, CC, IMC, C-T	Calcium channel blocker	2.5 mg/min Not less than 2 min and for geriatric patients	10 mg	Do not dilute	HR, BP, ECG	↓ BP, ↓ HR

			not less than 3 min				