

NEW 2006 ACLS PHARMACOLOGY I & II

DRUGS	CLASSIFICATION	ACTION	INDICATIONS	DOSAGE	CONSIDERATIONS/PRECAUTIONS
<u>OXYGEN</u>	Medicinal Gas	Improves tissue oxygenation	1. Chest Pain 2. Suspected hypoxia 3. Cardiac Arrest	NC 1 – 6 L Mask 6-10 L NRB 10+L 100% in Code	O ² toxicity, chronic CO ² retainers BUT never withhold O ² in known or suspected hypoxia – EVEN IF HAVE COPD
<u>EPINEPHRINE</u> (Adrenalin, Epi)	Sympathomimetic	A1=Vasoconstriction B1=↑ HR, contractility And conduction B2=Bronchodilation ↑ perfusion pressure with CPR ↑ cardiac & CNS blood flow	1. VF or Pulseless VT 2. Asystole 3. PEA 4. ↓ SVR	1. 1 mg 1:10,000 IV MR q 3-5 min 2. 2-2.5 mg (1:1000) if via ETT MR q 3-5 min 3. Drip 1 mg/250 mL at 2-10 mcg/min & titrate (1:1000)	Incompatible with NaHCO ³ Tachydysrhythmias = ↑ workload of heart
<u>ATROPINE</u>	Parasympatholytic	↑ HR & AV conduction velocity	Symptomatic bradydysrhythmias, Asystole Bradycardic PEA <u>Symptomatic = Hemodynamic compromise</u> 1. Hypotension 2. S/S peripheral hypoperfusion	<u>Bradycardia:</u> 0.5 mg q 3-5 min max = 3 mg <u>ETT</u> = 2-2.5 x IV dose <u>Code dose</u> = 1 mg q 3-5 min. Max = 0.04 mg/kg	Tachydysrhythmias, VT, VF Caution with MI or myocardial ischemia Dose less than 0.5 mg may cause parasympathomimetic effect
<u>AMIODARONE</u> (Cordarone)	Antiarrhythmic	Noncompetitive inhibitor of both alpha and beta adrenergic receptors. Inhibits outward potassium current, sodium channels which prolongs QT interval, QRS duration and slows ventricular conduction	1. MAT, SVT, JT 2. Pulsed VT 3. PVT/V-fib	<u>Perfusing Tachys:</u> 150 mg IV push dilute in 100 mL and give over 8-10 mins MAX dose: 2.2 gms/24 hr <u>VT/VF:</u> 300mg dilute in 20-30 mL <u>If dysrhythmia clears:</u> hang drip of 360 mg IV over 6 hours (1mg/min) and then 540 mg IV over 18 hours (0.5mg/min)	Do not give with Procainamide Causes vasodilation May increase risk of Polymorphic VT HYPOTENSION May worsen existing arrhythmias or promote new ones
<u>LIDOCAINE</u> (Xylocaine)	Antiarrhythmic	Depress automaticity. Blocks re-entry. No significant effect above HIS bundle	1. VT STABLE 2. Polymorphic VT IF AMIODARONE NOT AVAILABLE USE FOR PVT AND V-FIB	<u>VT w/pulse - STABLE</u> 0.5 – 0.75 mg/kg up to 1-1.5 mg/kg MR @ 0.5 - 0.75 mg/kg q 5-10 min to total 3 mg/kg <u>VF/VT</u> 1-1.5 mg/kg – repeat ½ dose in 3-5 min to <u>total</u> 3 mg/kg <u>Follow up with drip if dysrhythmia clears</u>	CNS Toxicity - if present then ↓ dose and monitor closely. Start maintenance drip at 1 mg/min higher than total bolus dose. i.e., gave 2.5 mg/kg = 4 mg/min drip 1 mg /kg = 2 mg/min drip = 30 gtts 1-2 mg/kg = 3 mg/min drip = 45 gtts 2-3 mg/kg = 4 mg/min drip = 60 gtts

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<u>ADENOSINE</u> (Adenocard)	Endogenous purine nucleoside	Depresses AV node & sinus node activity	SVT/PSVT and AT/PAT involving re-entry pathway, including AV node	6 mg IV over 1-3 seconds with 20 mL/NS flush <u>MR</u> in 1-2 min 12 mg over 1-3 sec. rapid IV push <u>X2</u>	Common but Transient: 1. Flushing 2. Dyspnea 3. AV block/ Asystole 4. Chest pain 5. Sinus bradycardia 6. Ventricular ectopy Theophylline (& xanthine derivatives) block action Persantine & Tegretol potentiate action
<u>VERAPAMIL</u> (Calan) <u>DILTIAZEM</u> (Cardizem)	Slow Calcium Channel Blocker	1. (-) Inotropic 2. (-) Dromotropic 3. Vasodilator 4. Slows conduction & ↑ refractory state through the AV node	STABLE - A-flutter & A-fib with RVR STABLE- SVT, JT, MAT, PAT when vagal maneuvers and Adenosine unsuccessful	<u>Verapamil</u> 2.5-5 mg IV over 2 min. MR 5-10 mg q 15-30 min <u>Diltiazem</u> 0.25 mg/kg then 0.35 mg/kg in 15 minutes	Monitor BP & EKG Hypotension - freq. can be reversed by CaCl 10% 2-4 mg/kg or 0.5 - 1 gm IV AV block, severe bradycardia May exacerbate CHF in patients with left ventricular dysfunction. Not given with beta blockers
<u>Sodium Bicarbonate</u> (NaHCO ³ , Bicarb)	Alkaline	Buffering for metabolic acidosis	Metabolic acidosis when preexisting or has hyperkalemia, TCA OD, prolonged arrest state, alkalinization in ASA OD	Wait even in unwitnessed arrest 1 mEq/Kg initially, then 0.5 mEq/Kg q 10 min OR preferably according to ABG's <u>Always with appropriate ventilation</u>	Calcium, catecholamine incompatibility. Paradoxical cellular acidosis, hypernatremia, hyperosmolality. Metabolic alkalosis 1. Hypokalemia 2. O ² Hgb shift to left 3. CO ² retention Central venous acidosis exacerbation
<u>VASOPRESSIN</u> (Pitressin)	Antidiuretic Hormone	Increases reabsorption by the renal tubules. Directly stimulates smooth muscle contraction = vasoconstriction “produces same positive effects of epinephrine, but does not have the negative effects”	1 st or 2 nd line drug for CARDIAC ARREST INSTEAD OF epinephrine May be useful for hemodynamic support in vasodilatory shock	40 u IV - USE INSTEAD OF 1ST OR 2ND DOSE OF EPI IN CODE SITUATION	Potent peripheral vasoconstrictor ↑ SVR <u>may</u> provoke cardiac ischemia Not recommended for responsive patients with CAD
<u>MAGNESIUM</u> (Mag Sulfate)	Electrolyte	Deficiency is associated with cardiac arrhythmias, symptoms of cardiac insufficiency and sudden cardiac death.	1. Suspected Hypomagnesemia - if present in recurrent and refractory VT/VF 2. Drug of choice for Torsades de Pointes	Torsades/AMI 1-2 gm in 50 - 100 mL over 5-60 min THEN 0.5 to 1 gm/hr	Can cause CNS depression and respiratory depression

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<u>NITROGLYCERIN</u> (Nitrostat, Nitrobid)	Coronary vasodilator	1. Preload reduction- with venodilation (30-40 mcg/min) 2. Afterload reduction - (150-500 mcg/min) ARTERIAL dilation (as left ventricular filling pressure is decreased, arterial dilation effect is also ↓ Dilates coronary & cerebral arteries	Angina - Drug of choice after O ² PO/SL - Angina, MI IV - Acute MI, unstable CHF (preferred over Nipride) HTN WITH ACS	<u>SL</u> : 0.3-0.4 mg q 3-5 min as needed to total of 3 tabs. <u>IV</u> – 12.5 - 25 mcg Start at 10-20 mcg/min Titrate to pain/BP	Monitor BP & EKG, pain relief Hypotension/tachycardia Bradycardia/syncope Reperfusion dysrhythmias Headache
<u>MORPHINE</u> (MSO ₄)	Narcotic analgesic CNS depressant	Preload reduction Mild afterload reduction Anti-anxiety, pain relief	1. MI 2. Pulmonary Edema	2-4 mg q 5 - 30 min titrate to symptoms	Monitor for: 1. BP - hypotension 2. Respiratory depression 3. Pain relief Reverse with naloxone/nalmefene
<u>FUROSEMIDE</u> (Lasix)	Loop Diuretic May have transient vasodilation effect with chronic CHF	1. Venodilation in 5 min 2. Diuresis	1. Pulmonary Edema 2. ↑ ICP 3. HTN emergency	0.5-1.0 mg/kg over 1-2 mins 20-40 mg IV usual dose double pts daily dose to 40-80 mg IV if no response, DOUBLE dose to 2 mg/kg over 1-2 mins	Monitor BP, EKG, I & O, and serum K ⁺ Hypotension Hypovolemia leading to Shock Metabolic alkalosis Hypokalemia Dig Toxicity
<u>ASPIRIN</u> (ASA)	Anti-inflammatory	Inhibits platelet aggregation	Chest pain – sx/sx ACS	160-325 mg p.o.	Allergic reaction Increased bleeding
<u>DOPAMINE</u> (Intropin)	Sympathomimetic	<u>Dopaminergic</u> = 1-2 mcg/Kg/min. <u>Beta</u> = 2-10 mcg/Kg/min <u>Beta & Alpha</u> = >10-20 mcg/Kg/min <u>Alpha</u> = >20 mcg/Kg/min	1. Hypotension not volume related 2. Cardiogenic shock 3. Bradycardia	400 mg/250 mL 800 mg/500 mL (1600 mcg/mL) as listed	Monitor BP, EKG, UO, Sx of infiltration as for Norepinephrine Tachydysrhythmias = ↓ dose or D/C Incompatible with NaHCO ₃ <u>TAPER, don't stop abruptly</u> MAO inhibitors potentiate

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<u>PROCAINAMIDE</u> (Pronestyl)	Antiarrhythmic	1. Bi-directional block 2. Depresses atrial & ventricular automaticity 3. ↑ Ventricular depolarization time 4. Widens QRS	VT w/ Pulse – STABLE Atrial fib or A-flutter Atrial Fib or flutter w/ WPW AVNRT	20 mg/min IV until: 1. Arrhythmia suppressed 2. Hypotension occurs 3. QRS widens ↑ 50% 4. Total 17 mg/Kg given <u>Drip</u> = 1-2 Gm /250-500 @ 1-4 mg/min	Monitor BP & EKG Hypotension with rapid injection = ↓ contractility. Caution with Acute MI. May reduce dose with renal failure or when on continuous infusion of > 3 mg/min in 24 hrs. May precipitate/worsen Torsades
<u>ATENOLOL</u> (Tenormin) <u>METOPROLOL</u> (Lopressor) <u>PROPRANOLOL</u> (Inderal) <u>ESMOLOL</u> (Brevibloc) <u>LABETALOL</u> (Normodyne)	Beta blockers	(-) Inotropic (-) Dromotropic (-) Chronotropic	Reduce incidence of VF in post MI patients. May reduce reinfarction in pts post-thrombolysis Convert SVT, A-fib, A-flutter Reduce myocardial ischemia in AMI Antihypertensive therapy for CVA	<u>Atenolol</u> : 5 mg IV over 5 min WAIT 10 min then 5 mg over 5 min <u>Metoprolol</u> : 5 mg slow IV q 5 min up to 15 mg <u>Propranolol</u> : 0.1 mg/kg divided in 3 doses at 2-3 min intervals. Not to exceed 1 mg/min <u>Esmolol</u> : 0.5 mg/kg over 1 min THEN drip 0.05 mg/kg/min <u>Labetalol</u> : 10 mg IVP over 1-2 min. MR or double q 10 min MAX of 150 mg	Bradycardias AV conduction delays Hypotension Caution with Reactive Airway Disease Not given with Ca ⁺⁺ channel blockers
<u>DIGITALIS</u> (Digoxin, Lanoxin)	Cardiotonic	(+) Inotropic (-) Dromotropic (-) Chronotropic	1. Control RVR in A-fib/A-flutter 2. CHF 3. PSVT	LOAD = 10 – 15 mcg/kg lean body weight Maintenance determined by body size and renal function	Monitor EKG, Serum K ⁺ toxicity: 1. GI 2. Visual 3. Dysrhythmias
<u>ACE INHIBITORS</u> <u>ENALAPRIL</u> (Vasotec) <u>LISINAPRIL</u> (Zestril) <u>CAPTAPRIL</u> (Capoten)	Angiotensin converting enzyme inhibitors	Prevents conversion of angiotensin I to angiotensin II ↓ SVR ↑ cardiac output	Reduce mortality and improve LV function in AMI Use for AMI with ST ↑, HTN, CHF w/o hypotension LV function ↓ 40%	<u>Enalapril</u> : 1.25 mg IV over 2 min, then 1.25 to 5.0 mg every 6 hrs OR 2.5 mg PO & titrate to 20 mg PO BID <u>Lisinopril</u> : 5 mg w/in 24 hrs of sx/sx, then 5 mg after 24 hrs, then 10 mg after 48 hrs, then 10 mg q day for 6 weeks <u>Captopril</u> : 6.25 mg PO Advance to 25 mg TID then 50 mg TID as tolerated	CONTRAINDICATED IN PREGNANCY Reduce dose in renal failure Avoid hypotension Contraindicated in angioedema

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<u>DOBUTAMINE</u> (Dobutrex)	Sympathomimetic Synthetic catecholamine	Potent (+) inotropic Some ↑ HR Freq causes reflex peripheral vasodilation May use synergistically with Nipride	1. Refractory CHF 2. Cardiogenic shock Dopamine 1st if ↓ BP	250 mg/250 mL OR 15 x kg wt = mg of drug in 250 mL Rate = 2-20 mcg/Kg/min	Monitor BP, EKG, UO Tachydysrhythmias Caution with CAD - May exacerbate ischemia with ↑ HR
<u>NOREPINEPHRINE</u> (Levophed)	Sympathomimetic	A1- Vasoconstriction B1 - ↑ Contractility	Cardiogenic shock Significant hypotension with < 70 mmHg systolic	4 mg/250 mL = (16 mcg/mL) 0.5-30 mcg/min	<u>Invasive monitoring</u> Monitor BP, EKG, UO, tachydysrhythmias. Caution with ischemic heart disease. Tissue necrosis & sloughing if infiltrates. Reinfiltrate area with Regitine (Phentolamine) 5-10 mg in 10-15 cc NS ASAP DO NOT GIVE WITH ALKALINES
<u>NITROPRUSSIDE</u> (Nipride)	Potent peripheral dilator Cyanide derivative	Acts directly on vasculature Preload & afterload reduction	1. Hypertensive Crisis 2. Heart failure	50 mg/250 mL initial dose: 0.1-5 mcg/kg/min TITRATE up q 3-5 mins Up to 5 mcg/kg/min may be required	<u>Invasive monitoring</u> , BP, Thiocyanate toxicity 1. Tinnitus 2. Blurred vision 3. Delirium 4. ABD/chest pain
<u>GLYCOPROTEIN IIB/IIIA INHIBITORS</u> <u>Abciximab</u> (Reopro) <u>Eptifibatide</u> (Integrilin) <u>Tirofiban</u> (Aggrastat)	Inhibits platelet aggregation		ACS w/o ST ↑ and no Q waves	<u>Abciximab:</u> 0.25 mg/kg IV bolus 10-60 min before procedure THEN 0.125 mcg/kg/min drip <u>Eptifibatide:</u> 180 mcg/kg bolus THEN 2mcg/kg/min drip <u>Tirofiban:</u> 0.4mcg/kg/min IV for 30 min, THEN 0.1mcg/kg/min drip	Active internal bleeding or bleeding disorder in last 30 days Hx of ICB Surgical procedure or trauma within 1 month, platelet count <150,000 Hypersensitivity