

Common Cardiac Medications

Jill Zender, APRN, CPNP-AC

Taylor Hutcheson, MSN, MBA, RN, CPN

Ashlee Fernandez, BSN, RN, CCRN

Kira Adkins, Clinical Pharmacist

Before we get started,
here is today's most
important take-away..

SAFETY
over
SPEED





Hormone Analog

Presented by Ashlee

Prostaglandin

What is it used to treat?

- Maintain patency of ductus arteriosus in neonates with ductal-dependent congenital heart disease as a bridge to surgical palliation

How does it work?

- Vasodilation of ductus arteriosus smooth muscle to prevent closure

Standard Dosing

- Continuous infusion- 0.05-0.1 mcg/kg/min; may increase higher to achieve desired effects

Side Effects

- Apnea, tachycardia, flushing, hypotension

General Information

- Side effects are dose dependent, lowest effective dose should be used
- Maintain permanent central access for administration or two PIVs at all times



Vasoconstriction

Normal blood vessel

Vasodilation



Vasopressors

Presented by Jill

Adrenaline

What is it used to treat?

- Hypotension – monitor BP frequently especially if titrating a continuous infusion
- Ventricular dysfunction

How does it work?

- **Systemic vasoconstrictor**
- Initial onset and half life are within minutes. Very quick

Standard Dosing

- 0.01-0.1mcg/kg/min but can be seen at higher doses in extreme cardiogenic shock
- 0.02-0.03mcg/kg/min is typical dose for ventricular dysfunction
- Code dose: 0.01mg/kg IV push

Side Effects

- Hypertension
- Tachycardia
- Arrhythmias

General Information

- Central IV access
- Syringe/bag CANNOT run dry – have a backup ready to switch before it's empty
- Double check medication/dose - high risk for error
- May need to decrease dose if the listed side effects are causing more harm than good

Noradrenaline

What is it used to treat?

- Hypotension

How does it work?

- Increases myocardial contraction and systemic vasoconstriction
- Onset and half life are within minutes

Standard Dosing

- 0.01-0.1mcg/kg/min but can be seen at higher doses in extreme cardiogenic shock
- Not used during codes

Side Effects

- Hypertension
- Tachycardia
- Arrhythmias

General Information

- Central IV access
- Syringe/bag CANNOT run dry – have a backup ready to switch before it's empty
- Double check medication/dose - high risk for error
- May need to decrease dose if the listed side effects are causing more harm than good

Dopamine

What is it used to treat?

- Hypotension or shock that persists after adequate volume resuscitation

How does it work?

- Stimulates adrenergic and dopaminergic receptors to produce cardiac stimulation and renal vasodilation

Standard Dosing

- 2-20 mcg/kg/min; titrate gradually by 5-10 mcg/kg/min until desired response is achieved

Side Effects

- Chest pain, ectopic beats, hypertension, tachycardia

General Information

- Frequently used in decompensated heart failure and cardiogenic shock

Dobutamine

What is it used to treat?

- Short-term management of cardiac decompensation due to decreased contractility

How does it work?

- Stimulates beta1 adrenergic receptors resulting in increased contractility and heart rate

Standard Dosing

- 0.5-1 mcg/kg/min; titrate gradually every few minutes to achieve desired response

Side Effects

- Chest pain, tachycardia, hypertension, ventricular arrhythmias

General Information

- Used frequently in adults with heart failure

Phenylephrine

What is it used to treat?

- Profound hypotension or during hypercyanotic spells to increase pulmonary blood flow

How does it work?

- Potent alpha-adrenergic agonist with no beta activity; produces systemic arterial vasoconstriction

Standard Dosing

- IV bolus- 5-20 mcg/kg/dose every 10-15 minutes as needed
- Continuous infusion- 0.1-0.5 mcg/kg/min; titrate to desired response

Side Effects

- Hypertensive crisis, pulmonary edema, ischemia

General Information

- Be sure to have prepared ahead of time as it requires a complicated dilution process

Milrinone

What is it used to treat?

- Decreased LV function
- Low cardiac output after bypass surgery

How does it work?

- Causes decreased systemic vascular resistance and lower afterload
- Some inotropic effect allowing the heart to pump more effectively

Standard Dosing

- Normal starting dose 0.25mcg/kg/min
- Range : 0.125mcg/kg/min - 0.75mcg/kg/min

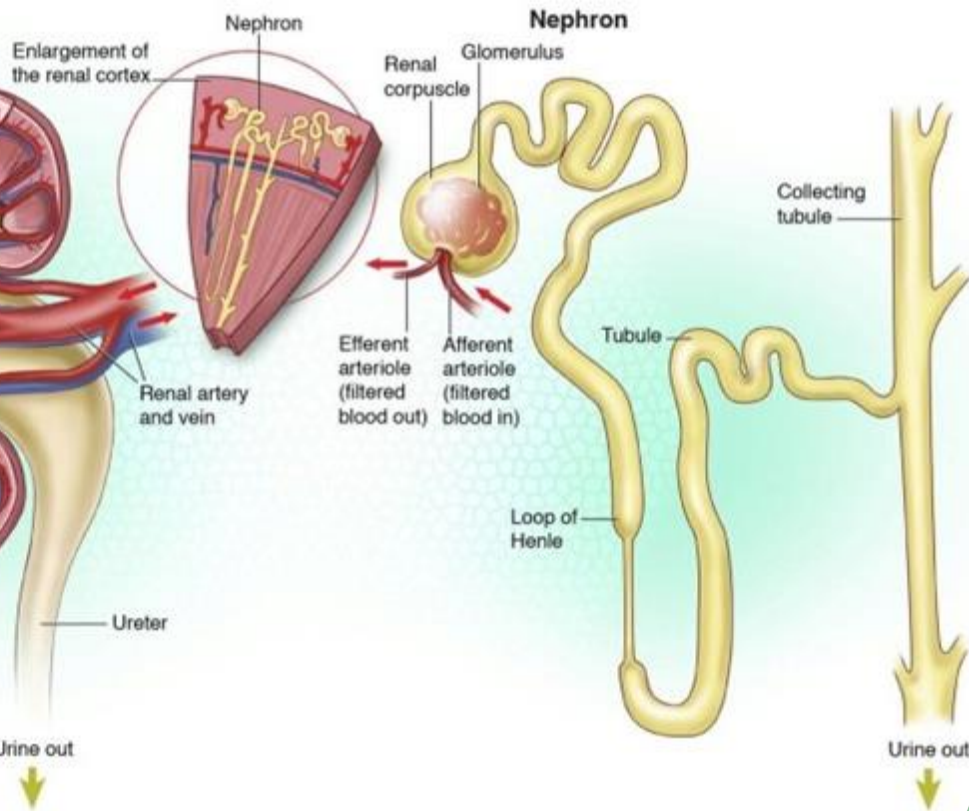
Side Effects

- Hypotension when initiating and changing the dose

General Information

- Half life is 4-6 hours
- Onset of action is 5-15 minutes
- Monitor blood pressure closely
- NOT compatible with furosemide

Cross Section of The Kidney



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Diuretics

Presented by Taylor

Furosemide

What is it used to treat?

- Edema
- Effusions

How does it work?

- **Loop diuretic** that works in the ascending loop of Henle
- Blocks salt reabsorption → increases salt excretion → water follows salt → water excretion

Standard Dosing

- PO: 1 - 2 mg/kg/dose Q6 to 24hrs; max 6 mg/kg/dose (acute) or day (chronic)
- Intermittent IV: 0.5 - 2mg/kg/dose Q6 to 12hrs, max 6 mg/kg/dose
- Continuous IV: 0.05 - 0.4mg/kg/hr, up to usual adult dosing range 10 - 40mg/hr

Side Effects

- Electrolyte loss: hypokalemia, hypomagnesemia, & hypocalcemia
- Tinnitus up to hearing loss
- Acute kidney injury due to fluid loss
- Hypersensitivity reactions

General Information

- Monitor and replete electrolytes

Torsemide

What is it used to treat?

- Edema
- Effusions

How does it work?

- **Loop diuretic** that works in the ascending loop of Henle
- Blocks salt reabsorption → increases salt excretion → water follows salt → water excretion

Standard Dosing

- Adult: Initial: 10 to 20 mg once daily; double the dose as needed (rather than administer the same dose more frequently) until diuresis occurs
- Max effective single dose: 50 to 100 mg; max recommended total daily dose: 200 mg in 2 divided doses to minimize risk of ototoxicity

Side Effects

- Electrolyte loss: hypokalemia, hypomagnesemia, & hypocalcemia
- Tinnitus up to hearing loss
- Acute kidney injury due to fluid loss (less risk of AKI as compared with furosemide)
- Hypersensitivity reactions

General Information

- Approximate oral dose equivalency (normal renal function): Torsemide 10 to 20 mg = bumetanide 1 mg = furosemide 40 mg
- Better absorption than furosemide with decreased cardiac output

Hydrochlorothiazide

What is it used to treat?

- Edema
- Effusions

How does it work?

- **Thiazide diuretic:** works in the distal tubules
- Blocks sodium and chloride reabsorption → increases sodium and chloride excretion → water follows salt → water excretion

Standard Dosing (PO)

- Infants & Children < 2 yrs: 1 to 2 mg/kg/day in 1 to 2 divided doses; max daily dose 37.5mg/day
- Children ≥ 2 yrs: 1 to 2 mg/kg/day in 1 to 2 divided doses; max daily dose 100 mg/day
- Adolescents: 1 to 2 mg/kg/day in 1 to 2 divided doses; max daily dose 200 mg/day

Side Effects

- Electrolyte disturbances: hypokalemia, hypomagnesemia, hypercalcemia, & hyponatremia
- Hyperuricemia and precipitate gout or gouty arthritis if susceptible
- Acute transient myopia & acute angle-closure glaucoma

General Information

- Don't use in patients with severe kidney disease or liver disease

Spirolonolactone

What is it used to treat?

- Edema
- Heart failure

How does it work?

- Potassium sparing diuretic
- Block the hormone aldosterone (normally promotes sodium reabsorption and potassium excretion) → reduces sodium loss in the urine and increases potassium retention

Standard Dosing (PO)

- Initial: 1 to 3 mg/kg/day divided Q6 to 24 hours; titrate as needed
- Max daily dose range: 4 to 6 mg/kg/day in divided doses Q6 to 12 hours not to exceed 400 mg/day

Side Effects

- Can cause hyperkalemia
- Gynecomastia

General Information

- Monitor electrolytes and replace or make adjustments to dose as needed



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Antihypertensives

Presented by Jill

Metoprolol

What is it used to treat?

- Hypertension
- Heart Failure (prevention of syncope)
- Postural Orthostatic Tachycardia Syndrome (POTS)

How does it work?

- Selectively inhibits beta₁-adrenergic receptors (primarily found in the heart) with little to no effect on beta₂-receptors (mostly located in lungs & other parts of the body)

Standard Dosing (PO)

- **Heart failure:** 0.1 to 0.2 mg/kg/dose BID, increase slowly PRN (usually Q2 weeks), usual daily dose: 1 mg/kg/day
- **Hypertension:** Initial: 0.5 to 1 mg/kg/dose (max: 25 mg/dose) BID; adjust dose based on patient response; max daily dose: 6 mg/kg/day not to exceed 200 mg/day
- **POTS:** ≥5 years & Adolescents: Initial: 0.5 to 1 mg/kg/day in two divided doses; titrate gradually to achieve clinical goal; max: 2 mg/kg/day

Side Effects

- Bradycardia including sinus pauses, hypotension, 1st degree HB (> 10% of the time)
- Hypoglycemia
- Bronchospasm (selective beta-blockers like metoprolol have lower risk than non-cardioselective beta-blockers)
- Fatigue, sleep disturbances, insomnia

General Information

- Don't give in incidence of severe sinus bradycardia, significant 1st degree HB (PR ≥ 0.24sec)
- Should be gradually tapered off to avoid acute tachycardia, hypertension, &/or ischemia

Captopril

What is it used to treat?

- Hypertension
- Heart Failure
- Left ventricular dysfunction after myocardial infarction
- Diabetic nephropathy

How does it work?

- ACE inhibitors prevent the conversion of angiotensin I to angiotensin II, a potent vasoconstrictor. By inhibiting angiotensin II, ACE inhibitors: lower blood pressure, reduce fluid retention, and protect the kidneys

Standard Dosing (PO)

- Start slow and increase based on clinical effect
- Infants: Initial: 0.05 to 0.2 mg/kg/dose Q6 to 24hrs; max daily dose: 6 mg/kg/day
- Children: Initial: 0.3 to 0.5 mg/kg/dose Q8hrs; max daily dose: 6 mg/kg/day
- Adolescents: Initial: 12.5 to 25 mg/dose Q8-12hrs; increase by 25 mg/dose weekly; Usual dose 150 mg/day

Side Effects

- Acute kidney injury
- Dry cough
- Hyperkalemia
- Skin rash
- Rare, but serious: Angioedema or bone marrow suppression

General Information

- Hypotension is most often observed in volume-depleted patients
- Use with extreme caution in patients with aortic stenosis

Nitroprusside

What is it used to treat?

- Hypertension

How does it work?

- **Onset and half life 2-5 minutes**
- Decreases systemic vascular resistance (vasodilation)
- Increases cardiac output by decreasing afterload

Standard Dosing

- Starting dose: 0.3-0.5 mcg/kg/min
- Titrate by: 0.3-0.5 mcg/kg/min q 5-15min
- Max dose: 3-5 mcg/kg/min

Side Effects

- Toxicity causes increase cyanide levels with neurologic changes
- Acute hypotension especially when initiating infusion

General Information

- Keep infusion syringe/bag away from light (wrap in aluminum foil or dark bag) - can cause discoloration and decomposition

Nitroglycerine

What is it used to treat?

- Myocardial ischemia d/t poor coronary perfusion

How does it work?

- Peripheral vasodilation of veins and arteries
- Vasodilation of coronary arteries

Standard Dosing

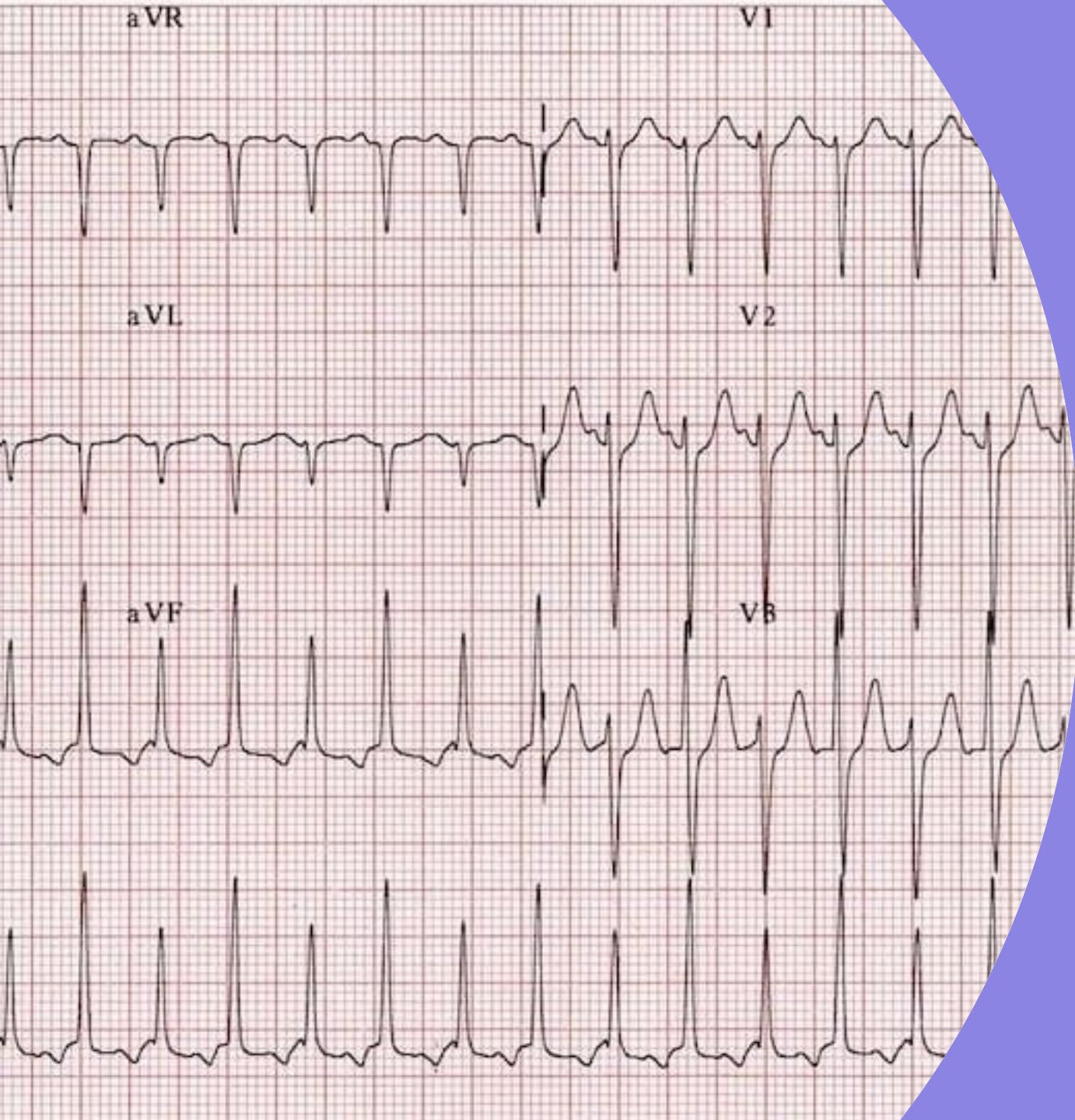
- Starting dose: 0.25-0.5 mcg/kg/min
- Range: 1-5 mcg/kg/min
- Titrate every 15-20 minutes by 0.5-1mcg/kg/min

Side Effects

- Acute hypotension, EKG changes, tachycardia
- Headache, dizziness, blurred vision

General Information

- Onset and half life are immediate
- Caution administration with other antihypertensives
- Often utilized in OR but rarely used in pediatric post op recovery unless surgery was done on coronaries and there is remaining concern for stenosis/injury



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Antiarrhythmics

Presented by Jill



Amiodarone



What is it used to treat?

- Life-threatening arrhythmias, such as ventricular fibrillation and hemodynamically unstable ventricular tachycardia

How does it work?

- Inhibits adrenergic stimulation by working on sodium, potassium and calcium channels by prolonging the action potential and refractory period in myocardial tissue; also decreases AV conduction and sinus node function

Standard Dosing

- Can be continuous infusion, bolus infusion or oral
- Loading dose- 5 mg/kg over 20-60 minutes; 10-20 mg/kg/d continuous infusion; PO 10-20 mg/kg/d divided BID, then reduced to 5-7 mg/kg/d daily after 2 weeks

Side Effects

- Bradycardia, hypotension, hepatotoxicity, proarrhythmic effects, pulmonary toxicity, thyroid effects

General Information

- Obtain baseline TFTs and check regularly, long half-life

Adenosine

What is it used to treat?

- SVT that is unstable or unresponsive to vagal maneuvers

How does it work?

- Slows conduction time through the A-V node and disrupts conduction pathways to restore normal sinus rhythm

Standard Dosing

- Initial dose: 0.1 mg/kg for pediatrics or 6mg for adults
- Repeat dose: 0.2 mg/kg for pediatrics or 12mg for adults

Side Effects

- **ASYSTOLE!** Or extreme bradycardia

General Information

- Administer via RAPID IV PUSH followed immediately with a flush (Stopcock method)
- Have emergency equipment available before administration (code cart, defib pads, code meds, airway)

Lidocaine

What is it used to treat?

- Treatment of ventricular arrhythmias

How does it work?

- Suppresses automaticity of conduction tissue by increasing electrical stimulation threshold of the ventricle; blocks initiation and conduction of nerve impulses

Standard Dosing

- 1 mg/kg/dose bolus
- 20-50 mcg/kg/min continuous infusion

Side Effects

- Bradycardia, circulatory shock, hypotension, respiratory depression

General Information

- Can also be used as a local anesthetic, be mindful of dosing difference

Digoxin

What is it used to treat?

- Treat mild to moderate heart failure
- Slow ventricular rate in supraventricular tachyarrhythmias (ex: SVT)
- Rate control in chronic atrial fibrillation

How does it work?

- Arrhythmias: *Suppresses AV node conduction* → increases refractory period & decreases conduction → positive inotropic effect
- Heart Failure: Inhibits Na/K ATPase pump → increases intracellular Na → promotes calcium influx → *increases contractility*

Standard Dosing

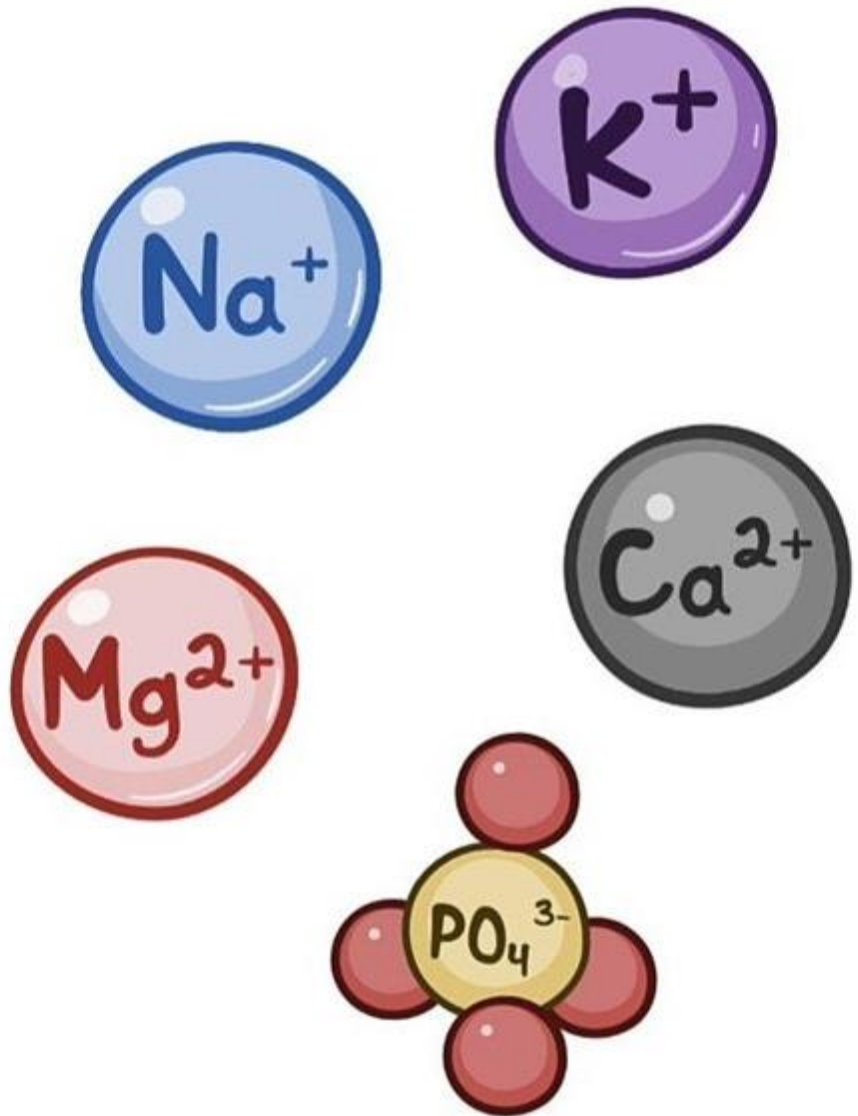
- Maintenance Dose:
 - 1mo – 10 years = 10 mcg/kg/day divided BID PO
 - > 10 years = 5 mcg/kg/day once daily PO

Side Effects

- Nausea/vomiting
- Visual disturbances (“halos,” yellow or blurred vision)
- Lethargy
- Arrhythmias (all types of AV block, PVCs) – children are more likely to experience cardiac arrhythmias r/t toxicity

General Information

- Never redose!
- Monitor & correct electrolytes – most concerned with hypokalemia, hypomagnesemia, & hypercalcemia (d/t toxicity)
- Do not give if bradycardic
- Vesicant when given IV
- Trough serum concentrations can be drawn – after 3-5 days of therapy prior to next PO/IV dose



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Electrolytes

Presented by Ashlee



Potassium



What is it used to treat?

- Low potassium levels
- Also given to stop the heart completely when on cardiopulmonary bypass

How does it work?

- Supplemental potassium chloride
- 1mEq = 1mmol

Standard Dosing

- 0.5-1mEq/kg max 20mEq per dose
- Please always check dose/volume/programming with a second nurse. **VERY HIGH-RISK DRUG**

Side Effects

- Hyperkalemia
- Blood vessel irritation if not given via central line
- Cardiac Arrest!

General Information

- Goal potassium 3.5-4 mEq/L
- Administer over 1.5-2 hours
- Monitor ECG for signs of hyperkalemia (peaked T waves)
- Be cautious in patients with AKI/renal dysfunction since the kidneys filter potassium



Calcium Gluconate



What is it used to treat?

- Low ionized calcium levels
- Acute hypotension

How does it work?

- Supplemental Calcium
- Increases myocardial contractility

Standard Dosing

- Pediatrics: 30-60mg/kg
- Adults: 1-2g

Side Effects

- Hypercalcemia
- Hypertension
- Warm flushed feeling

General Information

- Normal iCa levels 1.1-1.2
- Administer over 30min - 1hr
- Monitor IV site for irritation and give via central line if possible
- Can cause tissue necrosis if the medication infiltrates the extravascular space



Magnesium



What is it used to treat?

- Low magnesium levels
- Torsade de pointes

How does it work?

- Supplemental magnesium

Standard Dosing

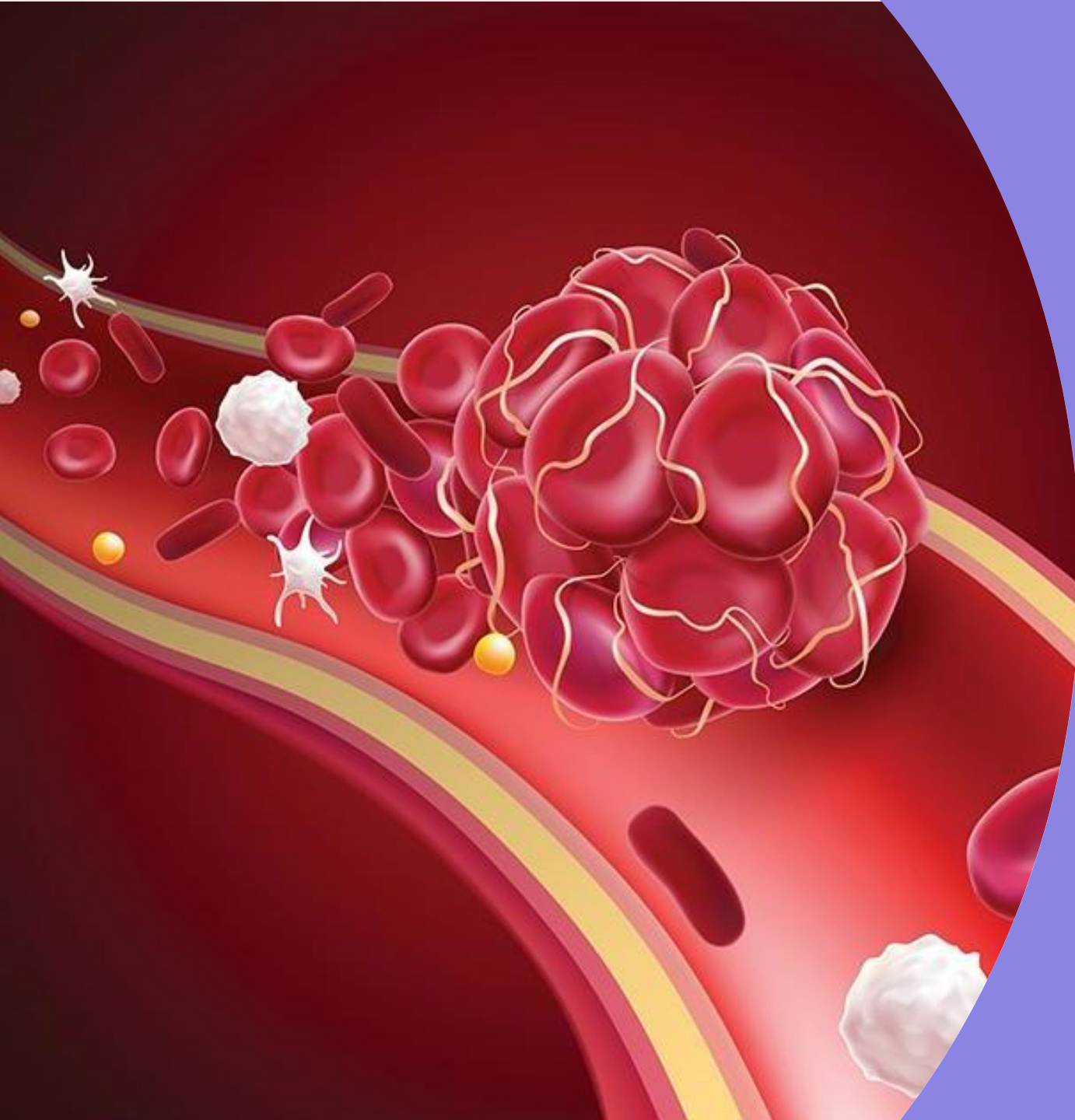
- Pediatrics: 25-50mg/kg
- Adults: 2-4g

Side Effects

- Hypermagnesemia
- Vasodilation

General Information

- Given via central line
- Administer over 1hr for low magnesium
- Give IV push for Torsade de pointes
- Caution in patients with AKI/renal dysfunction



Anticoagulation

Presented by Taylor

Heparin

What is it used to treat?

- Prevention of blood clot formation on artificial valves

How does it work?

- Inactivates thrombin and prevents fibrinogen conversion to fibrin

Standard Dosing

- Starting dose: 20-28units/kg/hr
- Increase by 10-20% for goal coagulation results (PTT or Anti-X A)

Side Effects

- Bleeding either internal or external – think often about risk for stroke

General Information

- Neuro checks!
- Check coagulation labs 4 hours after a change and daily
- No: rectal temps or hard bristle toothbrushes
- Be cautious with: placing or removing IV lines, placing new feeding tubes or foleys

Enoxaparin

What is it used to treat?

- Treatment of arterial or venous thromboembolism, myocardial infarction, non-hemorrhagic stroke, or mechanical valve prophylaxis
- Prophylaxis in high-risk patients (history of central line-related thrombosis, post cardiac surgery, or pulmonary hypertension)
- Venous Thromboembolism (VTE) prophylaxis

How does it work?

- Binds to and speeds up the activity of antithrombin III (protein that inhibits clotting) → activated antithrombin III then inactivates Factor Xa → clotting cascade blocked

Standard Dosing (Sub-Q)

- Dosing titrated to targeted levels using anti-Xa levels
- Treatment of thrombus: 1 mg/kg Q12hrs
- Prophylaxis in high risk patients: 0.75 - 1 mg/kg Q12hrs
- VTE prophylaxis: 0.5 - 0.75 mg/kg Q12hr; > 60kg, 30mg Q12hr or 40mg Q24hr

Side Effects

- Hemorrhage, Anemia
- Heparin-induced thrombocytopenia (HIT)
- Increased LFTs

General Information

- Complete baseline lab work within 48 hours before starting; check CBC 5-7 days after initiation to ensure platelet count has not fallen
- Draw anti-Xa level 4 hours after the 2nd or 3rd dose after initiation or dose change, then weekly if admitted, and monthly after discharge
- Will need to hold at least 24 hours prior to surgery and/or transition to IV heparin

Warfarin

What is it used to treat?

- Prophylaxis and treatment of thrombosis and thromboembolism

How does it work?

- Warfarin competitively inhibits the subunit 1 of the multi-unit VKOR complex, thus depleting functional vitamin K reserves and hence reduces synthesis of active clotting factors

Standard Dosing

- Dose based on INR levels (therapeutic target 2-3; prophylaxis target 1.5-1.9); Draw daily INR until therapeutic

Side Effects

- Bleeding, hemorrhage, stroke
- Decreased bone mineral density
- Calciphylaxis

General Information

- Strict lab monitoring required
- Remain on alternate anticoagulation therapy until therapeutic INR achieved
- Either avoid foods with high vitamin K, or maintain consistent diet (leafy greens), separate administration from feed/meal by 1 hour before and after

Aspirin

What is it used to treat?

- Prevent blood clots
- Temporary pain relief

How does it work?

- Antiplatelet Agent; NSAID
- Irreversibly inhibits COX-1 & 2 enzymes → decreased formation of prostaglandin precursors → irreversibly inhibits thromboxane A2 → inhibiting platelet aggregation

Standard Dosing (PO/PR)

- Antiplatelet effect: 1 to 5 mg/kg/dose once daily

Side Effects

- Dyspepsia, nausea
- Minimal at low doses

General Information

- Should be held prior to invasive procedures and surgery
- Can be given PR if PO administration is unsuccessful

Clopidogrel

What is it used to treat?

- Prevent blood clots

How does it work?

- Irreversibly blocks a specific receptor on the surface of platelets

Standard Dosing (PO)

- Infants & Children \leq 24 months: 0.2 mg/kg/dose once daily
- Children > 2 years and adolescents: 1mg/kg once daily, max 75 mg once daily

Side Effects

- Bleeding
- Hypersensitivity reactions
- Thrombotic thrombocytopenic purpura (TTP) – very rare

General Information

- Effects are seen for duration of platelet lifespan (~ 7-10 days)



8

Sedation/Pain

Presented by Ashlee

Fentanyl

What is it used to treat?

- Post-procedural/operative pain
- Intubated patients for <24hrs

How does it work?

- Opioid used to alter pain perception
- Onset of action 2-10 minutes and half life ~1hr

Standard Dosing

- Intermittent: 0.5-2mcg/kg
- Continuous: 0.5-2mcg/kg/hr
- Higher doses typically seen with increased exposure/dependence

Side Effects

- Sedation
- Respiratory depression
- Reversal agent - Naloxone

General Information

- Give over 2-5 minutes to avoid risk of chest wall rigidity
- Intermittent/PRN dose should be utilized for intubated patients

Morphine

What is it used to treat?

- Post-procedural/operative pain

How does it work?

- Opioid used to alter pain perception

Standard Dosing

- Pediatrics: 0.05-0.1mg/kg
- Adults: 1-3mg
- Can give q 5 minutes until pain appropriately resolved

Side Effects

- Respiratory depression, itching, nausea
- Hypotension
- CNS depression
- Reversal agent - Naloxone

General Information

- Can administer to patients who are not intubated
- Monitor blood pressure and respiratory drive
- Watch for signs of withdrawal after ~5-7 days of continuous infusions (sweaty/yawning/sneezing/diarrhea/vomiting/muscle rigidity)

Ketamine

What is it used to treat?

- Acute pain; procedural sedation; induction and maintenance of general anesthesia

How does it work?

- Produces cataleptic-like state in which the patient is dissociated from the surrounding environment by direct action on the cortex and limbic system

Standard Dosing

- 0.5-1 mcg/kg/dose; may repeat to achieve desired effect

Side Effects

- Hypertension, tachycardia, hypertonia, hallucinations

General Information

- Helpful anesthetic for patients with hemodynamic compromise

Propofol

What is it used to treat?

- Induction and maintenance of general anesthesia; sedation of intubated and mechanically ventilated patients

How does it work?

- Causes global CNS depression through agonism of GABA receptors and reduces activity through NMDA receptor blockade

Standard Dosing

- Sedation loading dose- 0.5-1 mg/kg/dose
- Continuous infusion- 1-4 mg/kg/h

Side Effects

- Myocardial suppression, arrhythmias, Propofol-related infusion syndrome (PRIS)

General Information

- Can cause a serious adverse reaction (PRIS) which manifests as dysrhythmia, widening of QRS complex, heart failure, hypotension and asystole. Risk is dose and duration related

Paracetamol

What is it used to treat?

- Treat fever and pain

How does it work?

- Inhibits COX enzymes in central nervous system

Standard Dosing

- PO: 10 to 15 mg/kg/dose every 4 to 6 hours PRN; do not exceed 5 doses in 24 hours; max daily dose: 75 mg/kg/day not to exceed 4,000 mg/day
- IV: 7.5 to 15 mg/kg/dose every 6 hours; maximum daily dose: 60 mg/kg/day; max single dose: 15 mg/kg up to 750 mg; max daily dose: 75 mg/kg/day not to exceed 3,750 mg/day

Side Effects

- Nausea, vomiting, constipation
- Liver damage
- Skin reactions, allergic reactions

General Information

- After surgery, consider giving as soon as tolerating liquids (PO) or IV as adjunct to IV pain medications

Ibuprofen

What is it used to treat?

- Treat fever and pain

How does it work?

- NSAID – Blocks the COX 1 and COX 2 enzymes responsible for the production of prostaglandins

Standard Dosing

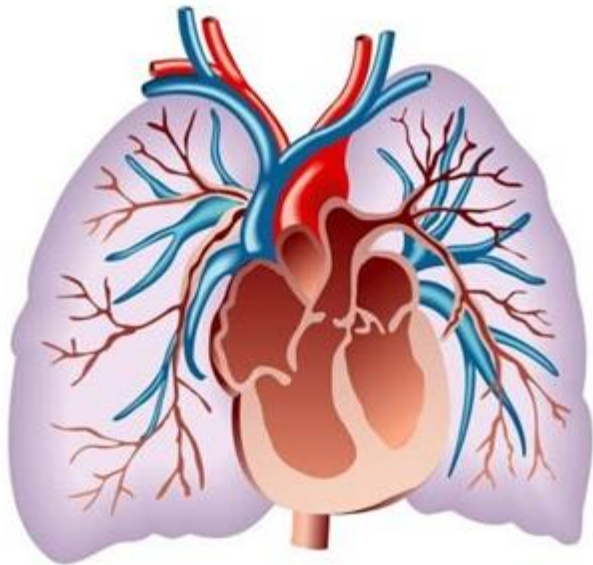
- PO: 4 to 10 mg/kg/dose (max dose: 600 mg/dose) every 6 to 8 hours as needed; maximum daily dose: 40 mg/kg/day

Side Effects

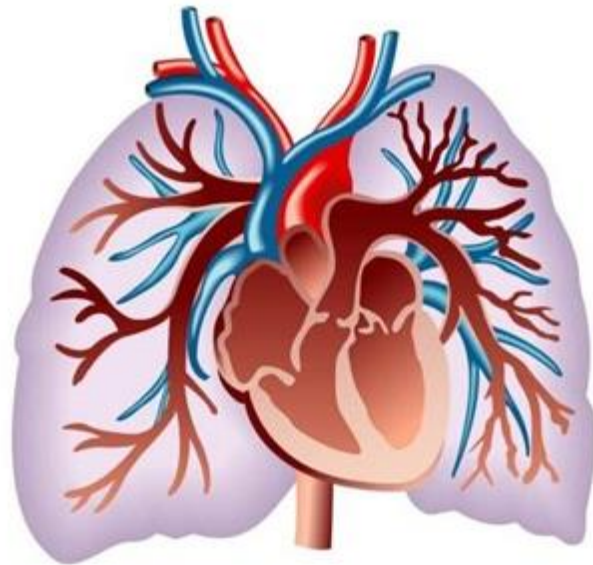
- Nausea, vomiting, dyspepsia
- Kidney damage
- Bleeding

General Information

- After surgery, consider giving as soon as tolerating liquids PO as adjunct to IV pain medications
- Careful with interactions with anticoagulants due to platelet effects



Pulmonary Hypertension



Normal Heart

9

Pulmonary Vasodilators

Presented by Taylor

Sildenafil

What is it used to treat?

- Treats pulmonary arterial hypertension (PAH)

How does it work?

- Phosphodiesterase Type-5 (PDE5) Inhibitor
- Inhibits PDE5 in smooth muscle of pulmonary vasculature → increases cGMP resulting in pulmonary vasculature relaxation → vasodilation in the pulmonary bed and systemic circulation (to a lesser degree)

Standard Dosing (PO)

- Infants: Initial: 0.25 mg/kg/dose Q6hrs or 0.5 mg/kg/dose Q8hrs; titrate as needed; max range: 1 to 2 mg/kg/dose Q8hrs.
- Children and Adolescents <18 years:
 - ≤20 kg: 10 mg three times daily.
 - >20 to 45 kg: 20 mg three times daily.
 - >45 kg: 20 mg three times daily; titrate as needed

Side Effects

- Flushing, headache
- Hypotension
- Diarrhea/upset stomach
- Vision/hearing changes (vision color changes, blurred vision, photophobia, tinnitus, dizziness)
- Priapism

General Information

- Can be given TID rather than Q8hrs for ease of administration

Tadalafil

What is it used to treat?

- Treats pulmonary arterial hypertension (PAH) – off label use

How does it work?

- Phosphodiesterase Type-5 (PDE5) Inhibitor
- Inhibits PDE5 in smooth muscle of pulmonary vasculature → increases cGMP resulting in pulmonary vasculature relaxation → vasodilation in the pulmonary bed and systemic circulation (to a lesser degree)

Standard Dosing (PO)

- Enteral: 1 mg/kg (max 40 mg) daily

Side Effects

- Flushing, headache, nausea, upset stomach
- Vision/hearing changes (vision color changes, blurred vision, photophobia, tinnitus, dizziness)
- Priapism
- Back pain, limb pain, myalgia
- Respiratory tract infection

General Information

- Administered once daily, which helps with compliance

Bosentan

What is it used to treat?

- Treatment of pulmonary arterial hypertension (PAH) in patients with idiopathic or congenital PAH to improve pulmonary vascular resistance (PVR)

How does it work?

- Endothelin Receptor Antagonists work by blocking the action of endothelin, a peptide that causes blood vessels to constrict, thereby widening the vessels and lowering blood pressure

Standard Dosing (PO)

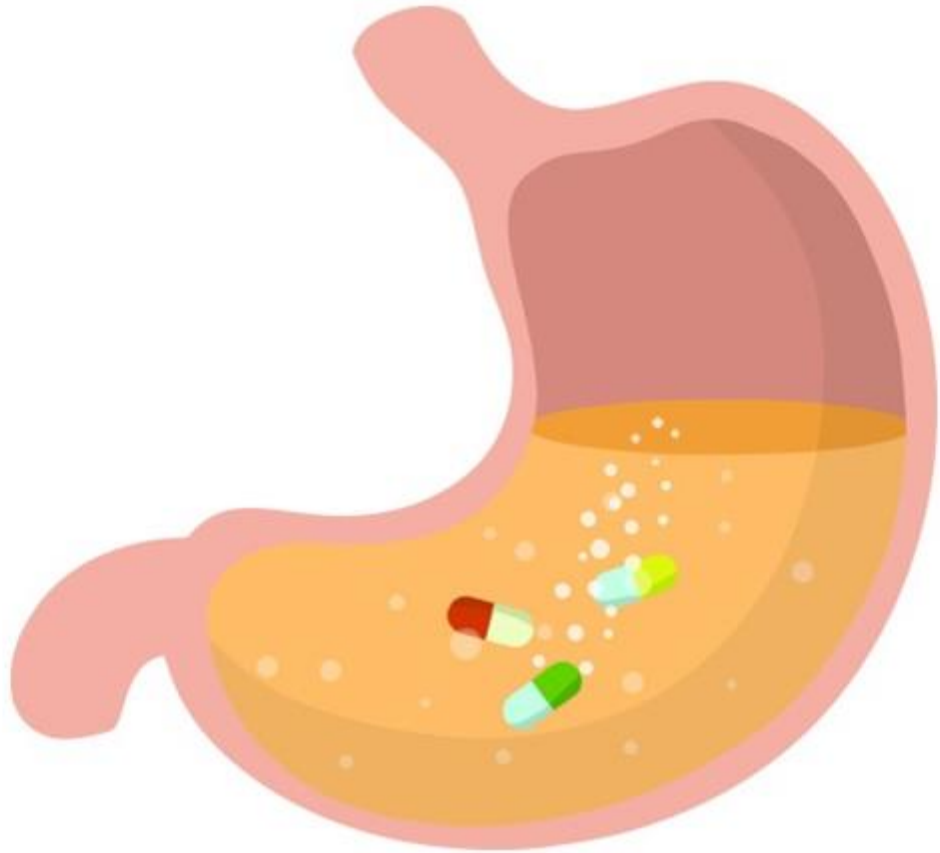
- Initial: 1mg/kg BID (max: 62.5 mg/dose) and continue for 3-7 days
- Evaluate LFT's prior to titrating to target dose of 2 mg/kg BID (max: 125 mg/dose)

Side Effects

- Edema
- Increased LFTs
- Headache
- Respiratory tract infection

General Information

- Teratogenic – wear gloves when handling; pregnancy test for all females of child-bearing age prior to initiation and then monthly thereafter and 1 month after discontinuation.
- Hepatotoxicity – monitor liver function tests (LFTs) prior to initiation, 1 week after initiating therapy or changing dose, and monthly



10

Gastrointestinal

Presented by Taylor

Omeprazole

What is it used to treat?

- Treatment of GERD, heartburn, & H. pylori

How does it work?

- Proton pump inhibitor
- Suppresses gastric basal and stimulated acid secretion by inhibiting the parietal cell H⁺/K⁺ ATP pump

Standard Dosing

- 5 kg to <10 kg: 5 mg once daily; 10 kg to <20 kg: 10 mg once daily; ≥20 kg: 20 mg once daily
- 1-4 mg/kg/day; max daily dose: 40 mg/day

Side Effects

- Diarrhea
- Hypomagnesemia; vitamin B12 deficiency
- Bone fractures

General Information

- Ideally used as a 14-day course
- Potential drug interactions: clopidogrel – can diminish antiplatelet effect, warfarin – can increase INR

Ranitidine

What is it used to treat?

- GERD, peptic ulcers, stress ulceration in critically ill patients

How does it work?

- Histamine H2 Antagonist - competitive inhibition of histamine at H2-receptors of the gastric parietal cells, which inhibits gastric acid secretion, gastric volume, and hydrogen ion concentration are reduced

Standard Dosing

- Infants, Children, and Adolescents \leq 16 yrs: 2 to 8 mg/kg/day divided twice daily; maximum daily dose: 300 mg/day
- > 16 yrs: 150 mg once daily up to twice daily

Side Effects

- Nausea, vomiting, headache, dizziness, insomnia

General Information

- No longer approved in United States due to NDMA (probable carcinogen)

thank you

Post-Test: Cardiac Pharmacology



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