

RHYTHM INTERPRETATION

CARDIAC PHARMACOLOGY

Primary Care Paramedicine

Module: 12
Section: 07



- Chronic heart failure or rapid atrial dysrhythmias
 - Rapid atrial flutter, atrial fibrillation, and supraventricular dysrhythmias
 - Acts by increasing the strength of cardiac contractions
- Symptoms of toxic effects of the drug
 - Loss of appetite
 - Nausea
 - Vomiting
 - Headache
 - Blurred vision
 - Yellow vision
 - Various cardiac dysrhythmias

- Used in the management of angina.
- 3 main classes
 - Nitrates
 - Beta blockers
 - Calcium channel blockers.

- Nitrates
 - First drugs used for the relief of angina

Table 30-21		Commonly Prescribed Nitrates
Generic Name	Trade Name	
Nitroglycerin	Minitran, Nitrostat, Nitrolingual, Nitrogard, Nitroglycerin, Nitrong, Nitro-Bid, Nitro-Dur, Nitrol, Nitroglyn, Nitroject, Transderm-Nitro, Trinipatch	
Isosorbide dinitrate	Isordil, Sorbitrate, Imdur, Apo-ISDN	

- Nitrates (continued)
 - Nitroglycerin
 - Prototype of this group
 - Sublingual spray, rapid-acting sublingual tablets, sustained-release oral tablets, topically applied ointment, and skin patches
 - Causes significant vasodilation
 - How much did the patient take?
 - Did the nitroglycerin relieve the pain?
 - Failure to relieve pain for a few reasons (pain is not cardiac, pain is of extraordinary severity, pain is from infarction rather than angina, or the nitroglycerin has been open too long and is no longer effective)

- Beta blockers
 - Block beta sympathetic receptors
 - Prescribed hypertension, angina, and chronic heart failure
 - Decrease the rate and strength of cardiac contractions
 - Taking beta blocking drugs on a regular basis usually leads to resistance to the action of beta stimulating agents (epinephrine).

Table 30-22		Beta Blockers
Generic Name	Trade Name	
Acebutolol	Rhotral, Sectral	
Atenolol	Tenormin	
Bisoprolol	Monacor	
Carvedilol	Coreg	
Esmolol	Brevibloc	
Labetalol	Normodyne, Trandate	
Metoprolol	Lopressor, Betaloc	
Nadolol	Corgard, Nadol	
Pindolol	Pindol, Visken	
Propranolol	Inderal, Pranol	
Sotalol	Sotacor	
Timolol	Timol	

- Calcium channel blockers
 - Block the influx of calcium ions into cardiac muscle
 - Prevent spasm of the coronary arteries and decrease the force of the cardiac contraction

Table 30-23		Calcium Channel Blockers	
Generic Name		Trade Name	
Diltiazem		Cardizem	
Verapamil		Calan, Isoptin	
Amlodipine		Norvasc	
Felodipine		Plendil, Renedil	
Nifedipine		Adalat, Procardia	

- Control chronic disturbances in cardiac rhythm
 - Patient has had significant dysrhythmias in the past.
 - Digoxin preparations are used to suppress atrial dysrhythmias.
 - Beta blockers are sometimes prescribed for their suppressive effect on myocardial excitability.

- Vaughn-Williams Classifications
 - Class I
 - Class II
 - Class III
 - Class IV

TABLE 7-7

Antidysrhythmic Classifications and Examples

General action	Class	Prototype	ECG effects
Sodium channel blockers	IA	Quinidine, procainamide*, disopyramide	Widened QRS, prolonged QT
	IB	Lidocaine*, phenytoin, tocainide, mexiletine	Widened QRS, prolonged QT
	IC	Flecainide*, propafenone	Prolonged PR, widened QRS
	I (Miscellaneous)	Moricizine*	Prolonged PR, widened QRS
Beta blockers	II	Propranolol*, acebutolol, esmolol	Prolonged PR, bradycardias
Potassium channel blockers	III	B retylium*, amiodarone	Prolonged QT
Calcium channel blockers	IV	Verapamil*, diltiazem	Prolonged PR, bradycardias
Miscellaneous		Adenosine, digoxin	Prolonged PR, bradycardias

*Prototype.

Table 30-24 Commonly Used Antidysrhythmic Medications		
Generic Name	Trade Name	Indications
Amiodarone	Cordarone	Ventricular tachycardia and other life-threatening ventricular dysrhythmias
Digoxin	Lanoxin	Atrial flutter or fibrillation
Disopyramide	Rythmodan	Ventricular dysrhythmias
Flecainide	Tambocor	Life-threatening ventricular dysrhythmias
Sotalol	Sotacor, Sotamol	Atrial and ventricular dysrhythmias
Mexiletine	Mexitil	Ventricular dysrhythmias
Procainamide	Procan, Pronestyl	Ventricular dysrhythmias
Quinidine	Cardioquin, Duraquin, Biquin Durules	Ventricular dysrhythmias, some atrial dysrhythmias
Tocainide	Tonocard	Ventricular dysrhythmias
Verapamil	Calan, Isoptin	Ventricular tachycardias

- Water pills
 - Prescribed to patients with chronic fluid overflow
 - Also used as primary or adjunctive therapy in the treatment of hypertension
 - Trick the kidneys into excreting more sodium and water
 - Kidneys tend to dump potassium.

Table 30-25 **Commonly Prescribed Diuretics**

Generic Name	Trade Name
Bumetanide	Burinex
Ethacrynic acid	Edecrin
Furosemide	Lasix
Apresoline	Hydralazine
Indapamide	Lozide
Metolazone	Zaroxolyn
Spirolactone	Aldactone, Spiroton
Hydrochlorothiazide (HCTZ)	Hydrozide, HydroDiuril
Combination Medications	
Hydrochlorothiazide and spironolactone	Aldactazide, Spirozone
Triamterene and hydrochlorothiazide	Dyazide, Triazide, Triamzide

- Treat hypertension
 - Diuretic agents are also used as antihypertensives or in combination with antihypertensives for a synergistic effect.
 - Beta blockers, calcium channel blockers, ACE inhibitors, and angiotensin II receptor blockers (ARBs) are also used.
 - Difficult to regulate the dosage
 - Some patients may experience symptoms of hypotension.
 - Orthostatic hypotension

Table 30-26

Commonly Prescribed Angiotensin-Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers

Generic Name	Trade Name
Candesartan ^a	Atacand
Captopril	Capoten
Enalapril	Vasotec
Irbesartan ^a	Avapro
Losartan ^a	Cozaar
Lisinopril	Prinivil, Zestril
Ramipril	Altace
Telmisartan ^a	Micardis
Valsartan ^a	Diovan

^aAngiotensin II receptor blockers.
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- Blood thinners
 - Diminish the ability of the blood to clot
 - Prescribed to patients who have had recurrent problems with blood clots and to patients who might be prone to develop clots
 - Apt to bleed excessively
 - Traditional oral anticoagulant drug is warfarin (Coumadin); newer medications include dabigatran (Pradax), rivaroxaban (Xarelto), and apixaban (Eliquis).

- Impede the ability of the blood to clot
 - Medications interfere with platelet aggregation and clot formation
 - Prescribed to patients with CHD and those with a coronary artery stent
 - Useful in the setting of AMI
 - Patients apt to bruise easily or bleed excessively
 - Most common antiplatelet medication is ASA; alternatives include dipyridamole (Aggrenox, Persantine) and ticlopidine (Ticlid). Other newer antiplatelet agents that are commonly administered for an acute STEMI include: clopidogrel (Plavix), ticagrelor (Brilinta), and prasugrel (Effient).