Definition of antiarrhythmic medication

An arrhythmia is a heart rhythm disorder caused by a problem in the electrical system, or "wiring," of the heart muscle. The heart may beat too slow (bradycardia), too fast (tachycardia) or in a chaotic or irregular pattern (extra beats or fibrillation).

Medications used to treat arrhythmias are chosen based on the nature, frequency and severity of the abnormal heart rhythm, and whether it arises in the upper chambers (atria) or lower chambers (ventricles) of the heart. These medications are divided into four types.

Many drugs prescribed for abnormal heart rhythms (arrhythmias) also are used to treat other conditions, such as hypertension, heart failure or heart attack (myocardial infarction).

Type I Antiarrythmics are called sodium channel blockers.

Each time the heart contracts, it sends out an electrical signal. The signal is generated by the flow of electrolytes through passageways in the heart called "ion channels." Electrolytes, or ions, include sodium, potassium, magnesium and calcium. Class I medications block sodium channels in heart cells, which decrease the conduction of electrical signals from cell to cell in the heart.

Class IA antiarrhythmics have been used for many years. Usually, they may be prescribed for abnormal heart rhythms that arise in parts of the heart above the ventricles (lower chambers) or less often in the ventricles themselves. These are called supraventricular arrhythmias. These drugs have only a moderate effect on sodium channels and usually prolong the duration of repolarization - the time it takes to "recharge" the heart after every beat. Some of these drugs, such as quinidine, also reduce the force of heart muscle contractions. They may not be suitable for patients with heart failure and other conditions that weaken the pumping ability of the heart. Class IA medications include:

- Disopyramide (Norpace)
- Procainamide (Procainamide HCl, Procan, Procanabid, Pronestyl)
- Quinidine (Quinidine sulfate, Quinaglute, Quinidex, Cardioquin)

Class IB antiarrythmics are the least effective at blocking sodium channels. They work by slowing nerve impulses in the heart, but they can make abnormal heart tissue less sensitive. Usually, they shorten the duration of repolarization. They are used primarily to treat ventricular arrhythmias. They include:

- Tocainide (Tonocard®)
- Mexiletine (Mexitel®)
- Lidocaine is used in emergency situations, and must be administered intravenously (through a tube into a vein).
- Phenytoin (Dilantin®) belongs to a class of drugs called anticonvulsants and usually is used to treat seizures. It also is used in certain patients with cardiac arrhythmias caused by digitalis medicine.

Class IC antiarrythmics are strong sodium channel blockers. They also slow nerve impulses in the heart, but
have little effect on repolarization. They may be used for supraventricular and some ventricular arrhythmias.

- Flecaainide (Tambocor®)
- Propafenone (Rhythmol®)

There is a chance that some antiarrhythmic drugs (and other types of drugs) may cause new heart rhythm problems, or make existing ones worse. If you have an arrhythmia, it is important to consult with your doctor. More than 80 marketed drugs, including some that are not used for heart problems, have been found to block potassium channels, prolong the QT interval (the time it takes the heart to recharge after each beat), and induce a fatal heart rhythm called torsades de pointes in some individuals.

**Type II antiarrhythmics are called beta-adrenergic antagonists, or Beta Blockers.**

Beta-blockers are used in the treatment of high blood pressure (hypertension), to relieve angina (chest pain) and in heart attack patients to help prevent additional heart attacks. Beta-blockers also are used to correct some irregular heartbeats. They affect the response to nerve impulses in certain parts of the body, decrease the heart's need for blood and oxygen and reduce its workload. They also help the heart beat more regularly. Some common beta-blockers are:

- Acebutolol (Sectral®)
- Atenolol (Tenormin®)
- Betaxolol (Kerlone®)
- Bisoprolol (Zebeta®)
- Carvedilol (Coreg®)
- Esmolol
- Metoprolol (Toprol®, Lopressor®)
- Nadolol (Corgard®)
- Propranolol (Inderal®)
- Timolol (Blocadron®)

**Type III antiarrhythmics are called potassium channel blockers.**

They slow nerve impulses by acting directly on the heart tissues. Type III medications lengthen the duration of repolarization without affecting the heart's normal electrical conduction. Efforts to develop new antiarrhythmic drugs have focused on Type III medications because they are less likely to adversely affect the heart's pumping ability and they act on tissues in both the upper and lower chambers of the heart. Type III drugs used to treat heart rhythm disorders are:

- Amiodarone (Cordarone®)
- Azimilide (Stedicor®)
- Bepridil
- Dofetilide (Tikosyn®)
- Ibutilide (Corvert®)
- Sotalol (Betapace®)
- Tedisamil

At present, type III antiarrhythmics are generally the most successful drugs for treating arrhythmias. They often are prescribed for atrial fibrillation and in addition to an ICD in patients at high risk for sudden cardiac death. The addition of medications helps to reduce the frequency and severity of abnormal rhythms and patients
receive fewer shocks from the ICD. Amiodarone and sotalol are the most frequently used drugs of this class. Patients taking these and other antiarrhythmic drugs often must be monitored closely, preferably by an electrophysiologist or other cardiologist who is an expert in heart rhythm disorders.

**Type IV antiarrhythmics are calcium antagonists, or calcium channel blockers.**

These drugs widen the blood vessels and may decrease the heart's pumping strength. They are often used to treat high blood pressure, but usually are not prescribed for people with heart failure or other structural damage to the heart. (They may be used to treat heart failure in people with stiff hearts.) They may be useful in treating coronary artery disease, or CAD (clogged blood vessels to the heart). They are also used to slow the heart rate.

**Why you need an antiarrhythmic medication**

The previous discussion included many of the common reasons why patients are placed on antiarrhythmic medication. These reasons include:

- Atrial fibrillation
- Supraventricular tachycardia
- Ventricular tachycardia
- Prevention of ICD shocks

**The risks of antiarrhythmic medication**

Each medication has its own side effect profile and risks of adverse events. For this reason, some of the medications can only be started while on a cardiac monitor in the hospital. Consult your pharmacist or physician for information regarding the medication(s) prescribed.

Often it is necessary to admit patients to the hospital to start some of these medications. The following sections pertain to an outpatient hospital admission for initiation of an antiarrhythmic medication.

**To prepare:**

- Blood tests may be ordered by your doctor in preparation for the hospital admission.
- Ask your doctor what medications you are allowed to take. Your doctor may ask you to stop certain medications one to five days before your procedure (such as aspirin, blood thinners, or rhythm medications). If you are diabetic, ask your doctor how you should adjust your diabetic medications. Bring a list of all medications with you.
- When you come to the hospital, wear comfortable clothes. You will change into a hospital gown for your stay. Leave all jewelry or valuables at home.
- You will need to stay in the hospital at least three days. Bring items with you (such as a robe, slippers, and toothbrush) that may make your stay more comfortable.
What to expect:

- You will be given a hospital gown to wear.
- The nurse will start an intravenous (IV) line in your arm so that medications and fluids can be administered if needed.
- You will be placed on a continuous cardiac monitor, or telemetry.
- The nurse will perform an EKG on arrival and usually after each dose of medication.
- Blood tests may be ordered every morning depending on the medication prescribed and any other medical conditions which need to be monitored.
- Hospital monitoring will continue for at least 72 hours on a stable dose of the medication being initiated. If a dose is increased, a full 72 hours at the new dose will be needed.
- Once the monitoring period is completed, you will be discharged.

After the hospital stay:

- Some medications require follow-up EKGs, blood tests, or other monitoring tests. Your doctor will discuss these follow-up tests with you prior to discharge.
- There are usually no additional restrictions following the initiation of a new medication. Please discuss with your doctor prior to discharge.

__________________________________________________
Patient signature                                       Date

__________________________________________________
Physician signature                                     Date