

# Heart and Circulatory System? Arrhythmia (Irregular Heartbeat)

Cardiac arrhythmias have a wide range of clinical significance, depending upon the type, location of origin, symptoms present, and the likelihood for sudden or subtle incapacitation. Arrhythmias that originate in the upper chambers of the heart, the atria, are referred to as "supraventricular" arrhythmias. The atria are the heart's pacemakers and also act as primers for the pump chambers, the ventricles. The most common atrial arrhythmia is atrial fibrillation, which is a rapid, irregular rhythm that can result in dizziness, shortness of breath, or loss of consciousness if the heart rate is too slow or fast.

Ventricular arrhythmias affect the lower pump chambers, the ventricles. Common ventricular arrhythmias include premature ventricular contractions (PVCs). These are fairly common in healthy people and can be brought on by a number of stimuli, including excessive caffeine consumption or stress. Ventricular tachycardia is a rapid heart rate with sudden onset. Symptoms of ventricular tachycardia include light-headedness, fainting, weakness, or mental confusion. This type of arrhythmia is often associated with underlying heart disease and requires good medical management.

The FAA issues medical certificates for many types of arrhythmias. Atrial fibrillation, atrial flutter, or ventricular/supraventricular arrhythmias that are *not* associated with underlying ischemic heart disease, cardiomyopathy (a disease of the heart muscle), or significant heart valve defect or outflow tract obstructions may be favorably considered for issuance of any class of medical certificate.

## Premature Ventricular Contractions (PVCs)

If there is a history of PVCs occurring at a rate of more than six per minute on a resting electrocardiogram, or that have caused symptoms, the FAA will require a [cardiovascular evaluation](#), including a 24-hour Holter monitor and graded exercise treadmill test.

## Radio Frequency Ablation

Many types of arrhythmias can be successfully treated with catheterization procedures. Radio frequency ablation uses high-frequency energy delivered through an electrode catheter to the area of origin of the abnormal rhythm. The energy that's delivered to the site interrupts the source of the arrhythmia. For recertification after having RF ablation, the FAA requires 90 days of stabilized recovery. After the recovery period, a current 24-hour Holter monitor, resting electrocardiogram (ECG), plus copies of medical records and a detailed report of your current status by the treating doctor.

## Cardioversion

Arrhythmias are also treated by either chemical injection, or by sending an electrical pulse to the heart to stabilize the abnormal rhythm. The FAA does not require any recovery time after chemical cardioversion, but a 24-hour Holter monitor will be needed to confirm normal heart rhythm. For electrical cardioversion, the FAA requires a 3-month recovery period. Following recovery, you will need to provide the FAA with a 24-hour Holter monitor report and tracings, resting ECG report and tracings, hospital/medical records, and a detailed, current status report from the treating physician.

## Conduction Defects

Although not considered arrhythmias, per se, certain types of electrical conduction defects called *bundle branch blocks* are not uncommon. These are partial or complete interruptions of the heart's electrical conduction network, or bundle branches, and occur either as left or right blocks. Right bundle branch block can appear in otherwise normal persons as a completely benign finding but can sometimes be indicative of an adverse cardiac condition.

A left bundle branch block (LBBB) is more of a concern because of the stronger correlation to coronary artery disease. LBBB makes interpretation of an electrocardiogram difficult because the bundle block masks part of the ECG tracing that identifies possible vessel blockage. For that reason, if there is a history of left bundle branch block, or a right bundle branch block in an individual over the age of 30, the FAA will request an *exercise radionuclide scan* as part of the [cardiovascular evaluation](#).

**Atrial fibrillation** is currently the most prevalent cardiac arrhythmia in the older U.S. population, increasing in prevalence from age 50 through the late 80s. The FAA reviews atrial fibrillation on the basis of additional risk factors. Persons over age 75, or who have a history of stroke, transient ischemic attack, left ventricular dysfunction (impaired heart pump function) with an ejection fraction of less than 40 percent, coronary heart disease, mitral valve disease, or prosthetic heart valve, and hyperthyroidism are considered higher risks for medical certification and are less likely to be favorably reviewed. Lesser risks with a higher likelihood of certification include hypertension, diabetes mellitus, and age less than 65.

The arrhythmia can be categorized into three different subtypes: chronic or persistent, recurrent paroxysmal, and idiopathic or "lone." Lone atrial fibrillation is the most benign form and is defined as lone because it has resolved, may have occurred only once, and/or has no associated underlying organic heart or thyroid disease. Factors that might contribute to the development of lone afib include high caffeine intake, excessive alcohol consumption, medications, fatigue, respiratory disease, stress, and acute diarrhea and gastroenteritis leading to an imbalance of electrolytes.

## Anticoagulation

Blood clots, or thrombus formation within the heart, are a risk with atrial fibrillation, and most people with this arrhythmia are on some form of anticoagulation, or blood thinning. For persons under age 65 who have no other risk factors, the FAA is usually



satisfied that proper anticoagulation is being achieved with aspirin only. If other risk factors are present, anticoagulation must include warfarin (Coumadin). In the age group of 65-75 with no risk factors, either aspirin or warfarin will be acceptable. If over age 75, warfarin is required.

When on warfarin, the FAA requires reports for 12 months of INR (International Normalized Ratio). These readings must be between 2.0-3.0. For first and second class medicals, the FAA may request these reports every six months. Interim reports for third class certification will be required every 12 months.

Holter monitor showing evidence of sinus pauses (a momentary disruption of the normal heart rhythm) of 3.0 seconds or longer during waking hours raises the risk of incapacitation to an unacceptable level, and the FAA will most likely deny certification.

A resting heart rate of more than 100 beats per minute (rapid ventricular response) or episodes of heart rate greater than 130-140 with minimal exertion will also preclude certification for any class of medical certificate.

Most antiarrhythmic medications are acceptable for controlling the ventricular response or maintaining sinus rhythm if there are no adverse side effects and if symptoms are well controlled. Low doses of Cordarone (amiodarone) may be used in treating atrial fibrillation. The use of flecainide (Tambocor) is not considered acceptable in the presence of left ventricular dysfunction or recent myocardial infarction. Other Class IC antiarrhythmics are acceptable.

Your cardiologist or internist should perform a complete [cardiovascular evaluation](#), including the following:

1. 24-hour ambulatory Holter monitor showing acceptable control of the arrhythmia. Atrial fibrillation cases should indicate *controlled* ventricular responses (heart rate no greater than 100 beats per minute)
2. *Maximal* exercise treadmill stress test demonstrating functional capacity equivalent to completion of *Stage III (9 minutes)* of the 12-lead [Bruce protocol](#). If beta-blockers, calcium channel blockers, or digitalis-type medications are being taken to inhibit heart rate response, it may be necessary to discontinue the drugs for 48 hours before testing in order to attain adequate heart rate. *Consult with your physician before discontinuing medication*. Submit report(s) and all original tracings.
3. M-mode and 2-dimensional echocardiograms (if anatomical abnormalities or cardiomyopathy is suspected).
4. Other diagnostic studies as may be indicated by history or clinical findings. (Stress SPECT radionuclide perfusion scan studies may be required if stress ECG abnormalities are present and suspicious for myocardial ischemia, or if there is a question of impaired cardiac function.)

#### **AASI for Atrial Fibrillation and Paroxysmal Atrial Tachycardia**

After initial certification by FAA staff doctors, subsequent renewals for *Atrial Fibrillation and Paroxysmal Atrial Tachycardia* qualify for AME Assisted Special Issuance (AASI), a process that provides examiners the ability to issue an airman medical certificate to an applicant who has a medical condition that is disqualifying under 14 CFR Part 67.

The authorization letter received from FAA, granted in accordance with part 67 ([14 CFR Part 67.401](#)), is accompanied by attachments that specify what information the treating physician(s) must provide for the renewal issuance.

Examiners may issue renewal of an airman medical certificate if the applicant provides the following:

- An authorization granted by the FAA.
- A current status report performed within 90 days that must include all the required follow-up items and studies as listed in the authorization letter and that confirms absence of disease progression.

The examiner should defer renewal certification to the AMCD or Region if the airman's condition has adversely changed.