Palpitations

http://www.heartfailurematters.org/EN/UnderstandingHeartFailure/PublishingImages/palpitations_lg.jpg

Palpitations are the perception of cardiac activity. They are often described as a **fluttering**, **racing**, or **skipping** sensation. They are common; some patients find them unpleasant and alarming. Palpitations can occur in the absence of heart disease or can result from life-threatening heart disorders. The key to diagnosis and treatment is to "capture" the rhythm on ECG and make careful observations during the palpitations.

Pathophysiology

The mechanisms responsible for the sensation of palpitations are unknown. Ordinarily, **sinus rhythm** at a normal rate is not perceived, and palpitations thus usually reflect changes in cardiac rate or rhythm. In all cases, it is the abnormal movement of the heart within the chest that is felt. In cases of isolated **extrasystoles**, the patient may actually perceive the augmented **postextrasystolic** beat as the "skipped" beat rather than the premature beat itself, probably because the extrasystole blocks the next sinus beat and allows longer ventricular filling and thus a higher stroke volume.

The clinical perception of cardiac phenomena is highly variable. Some patients are aware of virtually every premature ventricular beat, but others are unaware

of even complex atrial or ventricular tachyarrhythmias. Awareness is heightened in **sedentary**, anxious, or depressed patients and reduced in active, happy patients. In some cases, palpitations are perceived in the absence of any abnormal cardiac activity.

Etiology

Some patients simply have heightened awareness of normal cardiac activity, particularly when exercise, **febrile illness**, or anxiety increases heart rate. However, in most cases, palpitations result from **arrhythmia**. Arrhythmias range from benign to life threatening.

The **most common arrhythmias** include

- Premature atrial contractions (PACs)
- Premature ventricular contractions (PVCs)

Both of these arrhythmias usually are harmless.

Other common arrhythmias include

- **Paroxysmal supraventricular tachycardia** (PSVT)
- **Atrioventricular nodal reentrant tachycardia**
- **Atrial fibrillation** or flutter
- **Ventricular tachycardia**

Bradyarrhythmias rarely cause a complaint of palpitations although some patients are aware of the slow rate.

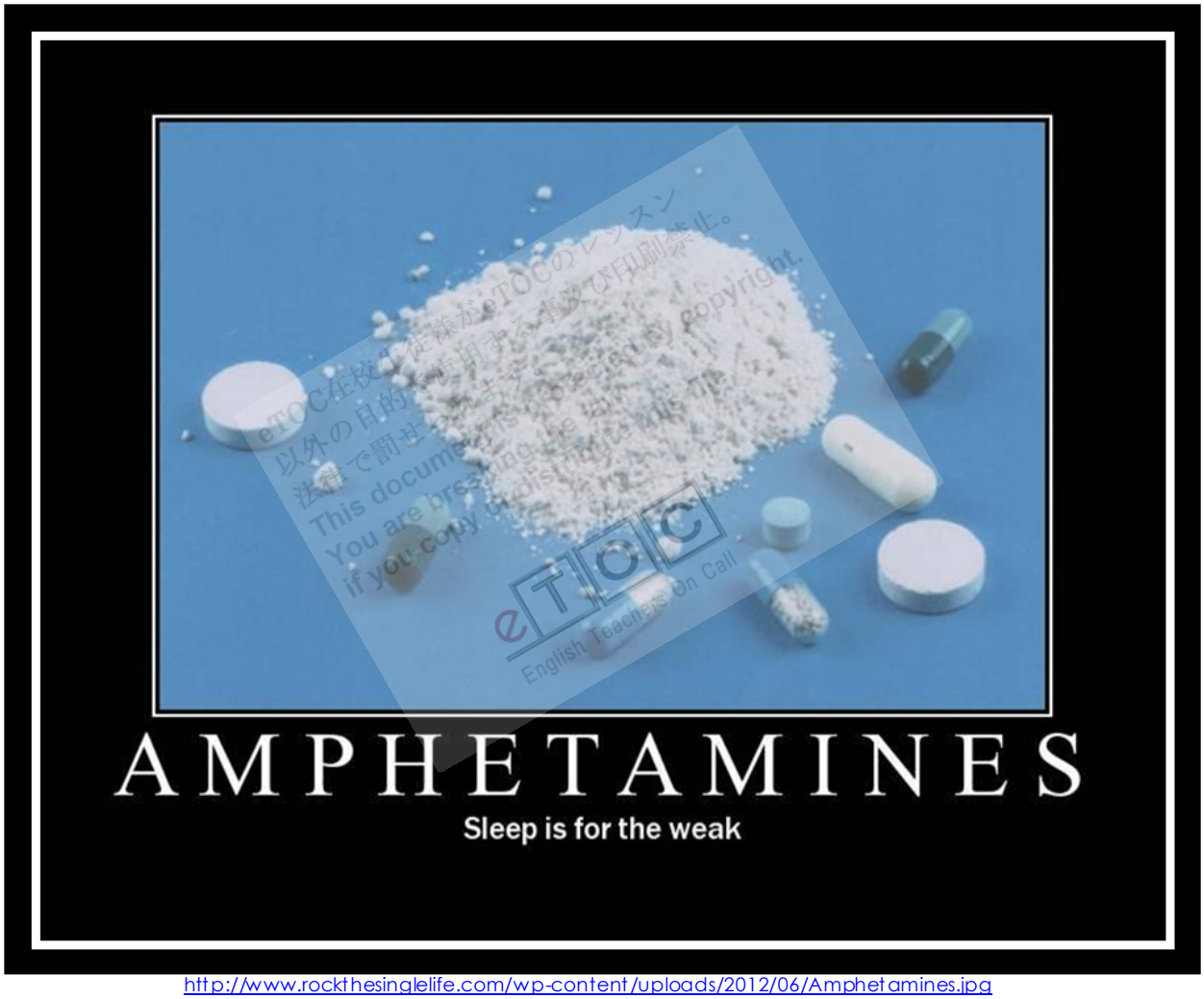
Causes of arrhythmias: Some arrhythmias (eg, PACs, PVCs, PSVT) often occur spontaneously in patients without serious underlying disorders, but others are often caused by a serious cardiac disorder.

Serious cardiac causes include myocardial ischemia or other myocardial disorders, congenital heart disease, valvular heart disease, and conduction system disturbances (eg, disturbances that cause bradycardia or heart block). Patients with orthostatic hypotension commonly sense palpitations caused by sinus tachycardia upon standing.

Noncardiac disorders that increase myocardial contractility (eg, **thyrotoxicosis**, **pheochromocytoma**, anxiety) may cause palpitations.

Some drugs, including digitalis, caffeine, alcohol, nicotine, and sympathomimetics (eg,albuterol, amphetamines, cocaine, dobutamine, epinephrine, ephedrine, isoproterenol, norepinephrine, and theophylline), frequently cause or exacerbate palpitations.

Metabolic disturbances, including anemia, **hypoxia**, **hypovolemia**, and electrolyte abnormalities (eg, **diuretic-induced hypokalemia**), can trigger or exacerbate palpitations.



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Consequences: Many arrhythmias that cause palpitations have no adverse physiologic consequences of their own (ie, independent of the underlying disorder). However, **bradyarrhythmias**, **tachyarrhythmias**, and heart blocks can be unpredictable and may adversely affect cardiac output and cause

hypotension or death. Ventricular tachycardia sometimes **degenerates** to ventricular fibrillation.

Evaluation

A complete history and physical examination are essential. Observations by other medical personnel or reliable observers should be sought.

History: **History of present illness** should cover the frequency and duration of palpitations and provoking or exacerbating factors (eg, emotional distress, activity, change in position, intake of caffeine or other drugs). Important associated symptoms include syncope, light-headedness, **tunnel vision**, **dyspnea**, and chest pain. Asking the patient to tap out the rate and **cadence** of palpitations is better than a verbal description and often allows a definitive diagnosis, as in the **"missed beat"** of atrial or ventricular extrasystoles or the rapid total irregularity of atrial fibrillation.

Review of systems should cover symptoms of causative disorders, including heat intolerance, weight loss, and tremor (**hyperthyroidism**); chest pain and dyspnea on exertion (cardiac ischemia); and fatigue, weakness, heavy vaginal bleeding, and dark tar-like stools (anemia).

Past medical history should identify known potential causes, including documented arrhythmias and heart or thyroid disorders. Family history should note occurrences of syncope or sudden death at an early age.

The drug profile should be reviewed for offending prescription drugs (eg, antiarrhythmics, digitalis, β-agonists, theophylline, and rate-limiting drugs); OTC drugs (eg, cold and sinus medications, dietary supplements containing stimulants), including alternative medicines; and illicit drugs (eg, cocaine, methamphetamines). Caffeine (eg, coffee, tea, numerous soft drinks and energy drinks), alcohol, and tobacco use should be determined.

Physical examination: The general examination should note whether an anxious **demeanor** or psychomotor agitation is present. Vital signs are reviewed for fever, hypertension, hypotension, tachycardia, bradycardia, tachypnea, and low O_2 saturation. Orthostatic changes in BP and heart rate should be measured.

Examination of the head and neck should note any abnormality or **dyssynchrony** of the jugular pulse waves compared with the **carotid pulse** or

auscultated heart rhythm and findings of hyperthyroidism, such as thyroid enlargement or tenderness and **exophthalmos**. The conjunctivae, palmar creases, and **buccal mucosa** should be inspected for **pallor**.

Cardiac auscultation should note the rate and regularity of the rhythm as well as any murmurs or extra heart sounds that might indicate underlying valvular or structural heart disease.

Neurologic examination should note whether resting tremors or brisk reflexes are present (suggesting excess sympathetic stimulation). An abnormal neurologic finding suggests that seizures rather than a cardiac disorder may be the cause if syncope is one of the symptoms.

Red flags: Certain findings suggest a more serious etiology:

- Light-headedness or syncope (particularly if injury occurs from syncope)
- Chest pain
- Dyspnea
- New onset of irregularly irregular heart rhythm
- Heart rate >120 beats/min or < 45 beats/min while at rest
- Significant underlying heart disease
- Family history of sudden death

Interpretation of findings: History and, to a lesser extent, physical examination provide clues to the diagnosis.

Palpation of the arterial pulse and cardiac auscultation may reveal a rhythm disturbance. However, the examination is not always diagnostic of a specific rhythm, except when it identifies the unique irregular irregularity of some cases of rapid atrial fibrillation, the regular irregularity of coupled atrial or ventricular extrasystoles, the regular tachycardia at 150 beats/min of PSVT, and the regular bradycardia of < 35 beats/min of complete atrioventricular block. Careful examination of the jugular venous pulse waves simultaneously with cardiac auscultation and palpation of the carotid artery allows diagnosis of most arrhythmias if an ECG is not available because the jugular waves will show the atrial rhythm while the auscultated sounds or the pulse in the carotids are the product of ventricular contraction.

Thyroid enlargement or tenderness with exophthalmos suggests **thyrotoxicosis**. Marked hypertension and regular tachycardia suggest **pheochromocytoma**.

Table 5

Suggestive Historical Findings with Palpitations	
Finding	**Possible Cause**
Occasional skipped beats	PACs, PVCs
Rapid, regular palpitations with sudden onset and termination Often history of recurrence	PSVT, atrial flutter with 2:1 atrioventricular block, ventricular tachycardia
Syncope following palpitations	Sinus node dysfunction, atrioventricular bypass tract (such as in **Wolff-Parkinson-White syndrome**), congenital long QT syndrome
Palpitations during exercise or an emotional episode	Healthy person: Sinus tachycardia History of coronary artery disease: Ventricular arrhythmia from exercise-induced ischemia
Palpitations following episodic* drug use	Drug-induced cause
Sense of doom, anxiety, or panic	Suggests (but does not confirm) a psychologic cause
Postoperative patient	Sinus tachycardia (eg, due to infection, bleeding, pulmonary embolism, pain)
Recurrent episodes since childhood	Supraventricular arrhythmia (eg, **atrioventricular nodal reentrant bypass tract**, Wolff-Parkinson-White syndrome) Congenital long QT syndrome (usually manifests during adolescence)

Family history of syncope or sudden death	**Brugada syndrome**, congenital long QT syndrome, inherited dilated or hypertrophic cardiomyopathy

□ *The role of regular use of drugs (particularly therapeutic drugs) or substances (eg, daily caffeine) can be hard to determine; sometimes a trial of withdrawal is diagnostic. All drugs with cardiovascular effects, most psychoactive drugs, and drugs capable of causing hypokalemia or hypomagnesemia must be suspected.

□ PACs = premature atrial contractions; PSVT = paroxysmal supraventricular tachycardia; PVCs = premature ventricular contractions.

Testing: Testing typically is done.

- ECG, sometimes with ambulatory monitoring
- Laboratory testing
- Sometimes imaging studies, stress testing, or both

ECG is done, but unless the recording is done while symptoms are occurring, it may not provide a diagnosis. Many cardiac arrhythmias are intermittent and show no fixed ECG abnormalities; exceptions include

- Wolff-Parkinson-White syndrome
- Long QT syndrome
- Arrhythmogenic right **ventricular dysplasia cardiomyopathy**
- Brugada syndrome and its variants

If no diagnosis is apparent and symptoms are frequent, **Holter** monitoring for 24 to 48 h is useful; for intermittent symptoms, an event recorder worn for longer periods and activated by the patient when symptoms are felt is better. These tests are used mainly when a sustained arrhythmia is suspected, rather than when symptoms suggest only occasional skipped beats. Patients with very infrequent symptoms that clinicians suspect represent a serious arrhythmia may have a device implanted beneath the skin of the upper chest. This device continuously records the rhythm and can be interrogated by an external machine that allows the cardiac rhythm to be printed.

Laboratory testing is needed in all patients. All patients should have measurement of CBC and serum electrolytes, including Mg and Ca. The cardiac marker troponin should be measured in patients with ongoing arrhythmias, chest

discomfort, or other symptoms suggesting active or recent coronary ischemia, myocarditis, or pericarditis.

Thyroid function tests are indicated when atrial fibrillation is newly diagnosed or there are symptoms of hyperthyroidism. Patients with paroxysms of high BP should be evaluated for pheochromocytoma.

Sometimes tilt-table testing is done in patients with postural syncope.

Imaging is often needed. Patients with findings suggesting cardiac dysfunction or structural heart disease require echocardiography and sometimes cardiac MRI. Patients with symptoms on exertion require stress testing sometimes with stress echocardiography, **nuclear scanning**, or PET.

Treatment

Precipitating drugs and substances are stopped. If dangerous or **debilitating arrhythmias** are caused by a necessary therapeutic drug, a different drug should be tried.

For isolated PACs and PVCs in patients without structural heart disease, simple reassurance is appropriate. For otherwise healthy patients in whom these phenomena are disabling, a β-blocker can be given provided efforts are made to avoid reinforcing the perception by anxious patients that they have a serious disorder.

Identified rhythm disturbances and underlying disorders are investigated and treated.

Table 6

Some Treatments for Arrhythmias

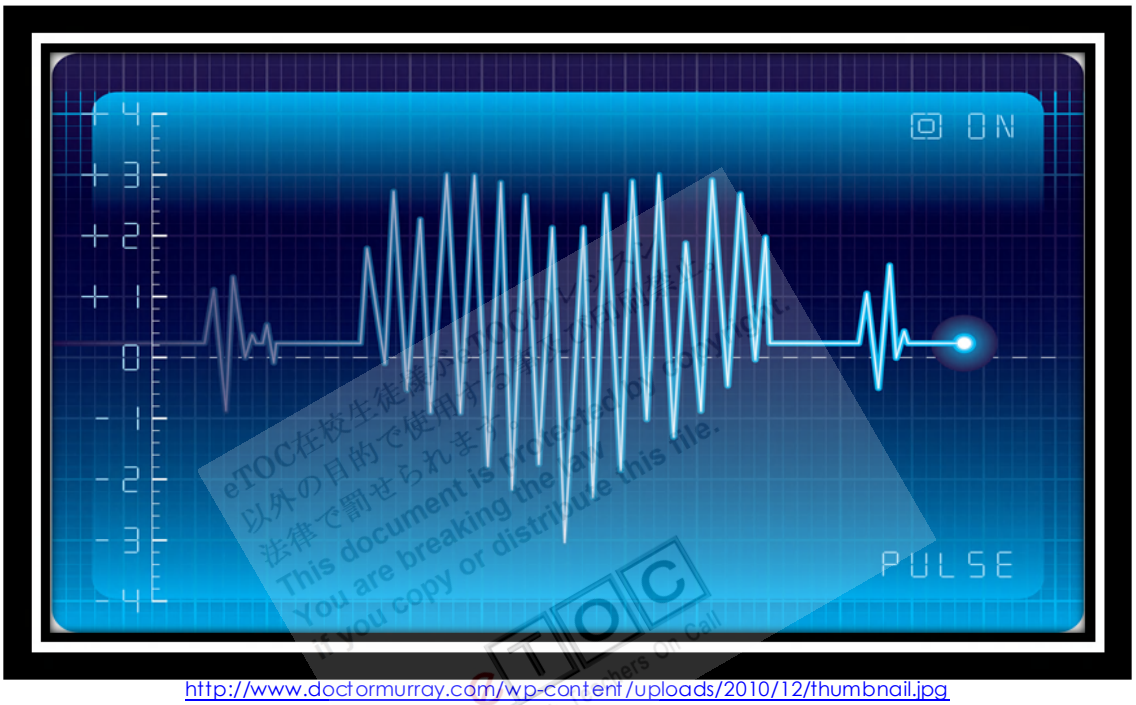
Disorder	Treatment*
Narrow complex tachycardias	
Multifocal atrial extrasystoles	Reassurance or β-blocker
Atrial fibrillation	Aspirin, warfarin, enoxaparin, unfractionatedheparin, DC cardioversion, flecainide, β-

	blocker,digoxin, verapamil, diltiazem, ibutilide, amiodarone, radioablation, or Maze procedure depending on clinical circumstances
Atrial flutter	DC cardioversion, digoxin, β-blocker, verapamil, anticoagulation, or radioablation
Supraventricular tachycardia	Vagotonic maneuvers, adenosine, DC cardioversion, β-blocker, verapamil, flecainide, amiodarone, digoxin, or radioablation
Atrioventricular nodal reentrant tachycardia	β-Blocker, verapamil, or radioablation
Broad complex tachycardias	
Ventricular tachycardia	DC cardioversion, amiodarone, sotalol, lidocaine, mexiletine, flecainide, radioablation, or an implanted defibrillator
Torsade de pointes	Mg, K, DC cardioversion, β-blocker, overdrive pacemaker, or an implanted defibrillator
Ventricular fibrillation	DC cardioversion, amiodarone, lidocaine, or an implanted defibrillator
Brugada syndrome	DC cardioversion or an implanted defibrillator

- *Always identify and correct causes and exacerbating factors (eg, electrolyte abnormalities, hypoxemia, drugs).
- DC = direct current.

Geriatrics Essentials

Elderly patients are at particular risk of adverse effects of **antiarrhythmics**; reasons include lower GFR and concomitant use of other drugs. When drug treatment is needed, lower doses should be used to start. Subclinical conduction abnormalities may be present (recognized on ECG or other studies), which might worsen with use of antiarrhythmics; such patients may require a pacemaker to allow the use of antiarrhythmics.



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Key Points

- Palpitations are a frequent but relatively nonspecific symptom.
- Palpitations are not a reliable indicator of a significant arrhythmia, but palpitations in a patient with structural heart disease or an abnormal ECG may be a sign of a serious problem and warrant investigation.
- An ECG or other recording done during symptoms is essential; a normal ECG in a symptom-free interval does not rule out significant disease.
- Most antiarrhythmics themselves can cause arrhythmias.
- If in doubt about a rapid tachyarrhythmia in a patient in hemodynamic distress, use **electrocardioversion** first and ask questions later.

Reference: http://www.merckmanuals.com