

## Palpitations and Management of Arrhythmias

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## Palpitations

- A sensory symptom
- An unpleasant awareness of the forceful, rapid or irregular beating of the heart
- Can be described as:
  - Rapid fluttering in the chest
  - Flip-flopping in the chest
  - Pounding sensation in chest or neck

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## Differential Diagnosis

- Cardiac Causes**
- Arrhythmia
  - Cardiac and extracardiac shunts
  - Valvular Heart Disease
  - Atrial Myxoma
  - Cardiomyopathy
  - Pericarditis

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## Differential Diagnosis

- Psychiatric**
- Panic Attack
  - Obsessive Disorder
  - Somatization
  - Depression
  - Loneliness
  - Grief

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## Differential Diagnosis

- Medications**
- Sympathomimetic Agents
  - Vasodilators
  - Anticholinergics
  - Beta Blocker withdrawal

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## Differential Diagnosis

- Habbits**
- Caffeine
  - Nicotine
  - Cocaine
  - Amphetamines

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### Differential Diagnosis

**Metabolic Disorders**

- Hypoglycemia
- Thyrotoxicosis
- Pheochromocytoma
- Argentaffinoma
- Scromboid Food poisoning

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### Differential Diagnosis

**High Output States**

- Anemia
- Pregnancy
- Paget's Disease
- Fever

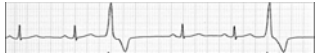
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### History

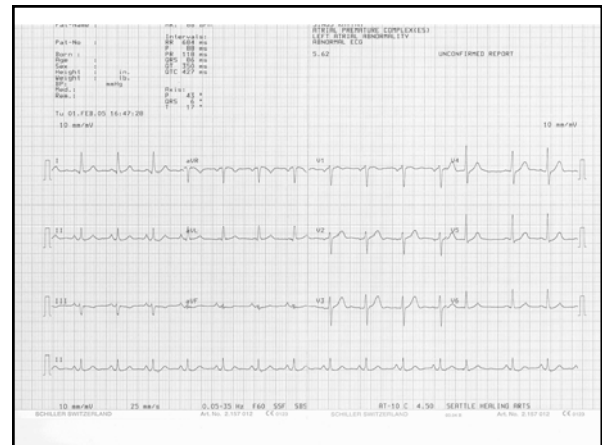
**Symptoms:**

- "flip-flopping in chest" – isolated PACs or PVCs

•Often caused by supraventricular or Ventricular premature contraction



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### History

**Symptoms:**

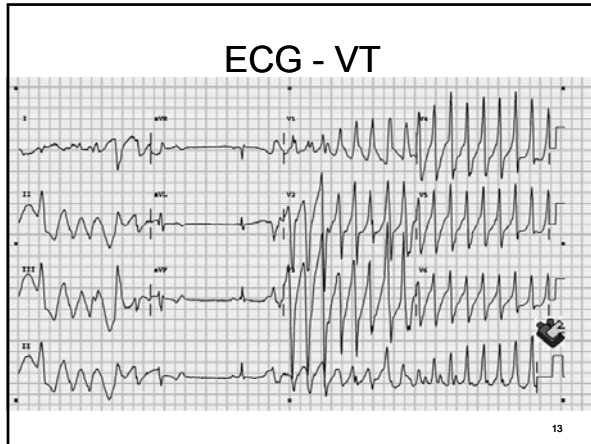
- "rapid fluttering in chest"

•Sustained supraventricular or ventricular arrhythmia including sinus tachycardia

•May be regular or irregular

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### History

**Symptoms:**

- “pounding in the neck”
- Irregular pounding of the neck is caused by arioventricular dissociation where the atria contract against an occasionally closed AV valve. Cannon A waves are formed.
- Examples include PVC’s, third degree heart block or ventricular tachycardia

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### History

**Mode of Onset:**

- Abrupt suggests paroxysmal abnormal tachycardia, though sinus tach may start abruptly in anxiety.

**Mode of Termination:**

- Abrupt suggests paroxysmal arrhythmia, though high adrenergic tone caused by arrhythmia may result in consequent sinus tach.

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### History

**Characteristics:**

- Rapid, irregular – AF, AFL, Atrial tachycardia, multiple PACs or PVCs
- Rapid, regular – SVT, VT

**Circumstances:**

- Panic/anxiety – the chicken or the egg?
- Catecholamine excess
  - Exercise – idiopathic RVOT VT, AF
  - Emotional startle – Long QT syndrome

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### Palpitations

- Most patients with Palpitations will have benign supraventricular or ventricular ectopy
  - PVC’s and non sustained ventricular tachycardia come in less often.
  - The above are not associated with increased mortality in pts with structurally normal hearts

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### Palpitations – Structurally Normal

- No history of cardiovascular disease, congenital anomalies
  - Normal ECG

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## Palpitations – Other rhythms

### ■ Atrial Fibrillation

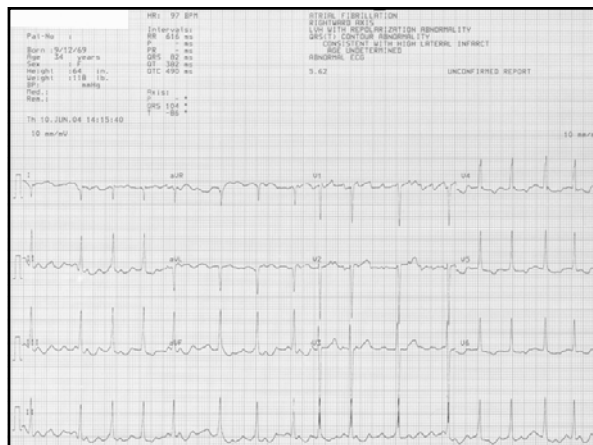
- Wolf Parkinson White
- Prolonged Q-T Syndrome

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## Palpitations – Other rhythms

### Atrial Fibrillation

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## Palpitations – Atrial Fibrillation

Three Questions to ask:

- Hemodynamically Stable?
  - Anticoagulate?
  - Rate vs. Rhythm Control?

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## Palpitations – Atrial Fibrillation

Hemodynamic Stability

### ■ Chest Pain

- Signs of heart failure
- Other perfusion Abnormalities

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## Palpitations – Atrial Fibrillation

Anticoagulation

### ■ Lone Atrial Fib

- Intermittent Atrial Fibrillation
- Persistent Atrial Fibrillation

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## Palpitations – Other rhythms

### ■ Atrial Fibrillation

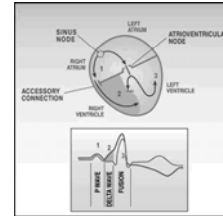
- Wolf Parkinson White
- Prolonged Q-T Syndrome

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## Palpitations – Other rhythms

### Wolf Parkinson-White Syndrome

### ■ Characterized by delta wave



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## Palpitations – Other rhythms

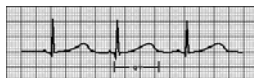
### Prolonged QT Interval

- Increased risk of torsade de pointes
  - Primary Sx: palpitations, syncope seizures and cardiac arrest
  - Can be congenital or acquired

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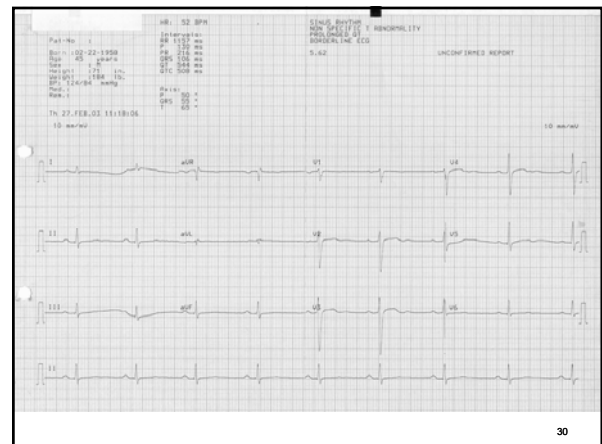
## Palpitations – Other rhythms

### Prolonged QT Interval



Prolonged QT interval The corrected QT interval (QTc) is calculated by dividing the QT interval (0.60 seconds) by the square root of the RR interval (0.84 seconds). In this case, the QTc is 0.65 seconds.

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**Palpitations – Other rhythms**

QTc = QT interval / square root of RR

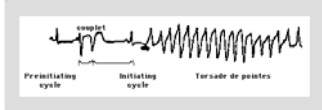
QT is measured in lead II, maybe V2-3, V56

QT is not always prolonged and varies over time

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**Palpitations – Other rhythms**

**Prolonged QT Interval**




**Torsade de pointes:** The electrocardiographic rhythm strip shows torsade de pointes, a polymorphic ventricular tachycardia associated with QT prolongation. There is a short, preinitiating RR interval due to a ventricular couplet which is followed by a long, initiating cycle resulting from the compensatory pause after the couplet.

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**Palpitations – Other rhythms**

**Prolonged QT Interval**



**Torsade de pointes:** This is an atypical, rapid, and bizarre form of ventricular tachycardia that is characterized by a continuously changing axis of polymorphic QRS morphologies.

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**Palpitations – Prolonged QT**

**Drugs that cause prolonged Q-T Intervals:**

**Antiarrhythmics:**

- Amiodarone
- Disopyramide
- Dofetilide, sotalol, ibutilide
- Quinidine
- Sotalol

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**Palpitations – Prolonged QT**

**Drugs that cause prolonged Q-T Intervals:**

**ANTIHISTAMINES:**

- Astemizole
- Terfenadine

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**Palpitations – Prolonged QT**

**Drugs that cause prolonged Q-T Intervals:**

**ANTIMICROBIALS:**

- Erythromycin, azithro, clarithro
- Some fluoroquinolones
- TMP/SMZ
- Other: Pentamidine, chloroquine, mefloquine

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## Palpitations – Prolonged QT

### Metabolic Disorders:

- Anorexia nervosa
- Hypocalcemia
- Hypokalemia
- Hypomagnesemia
- Hypothyroidism (sporadic case reports)
- Liquid protein diets
- Starvation

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## Palpitations:oth Considerations

### ■ Mitral Valve Prolapse

- Organic Heart Disease
- Obsession

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## Palpitations:oth Considerations

### ■ Mitral Valve Prolapse

- Organic Heart Disease
- Obsession

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## Palpitations-other Considerations Mitral Valve Prolapse

Framingham Heart Study compared 84 patients with MVP to 3403 control subjects;

Chest pain, dyspnea, syncope, CHF, AF and ECG abnormalities were equally prevalent in matched controls.

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## Palpitations-other Considerations Mitral Valve Prolapse

- Elevated urine and plasma catecholamine levels
- Exaggerated heart rate response to phenylephrine
- Decreased bradycardic response to dive reflex
- Isoproterenol reproduces symptoms

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## Palpitations-Main Points

- Symptoms sometimes characterizes the arrhythmia
- Arrhythmia is almost always benign in healthy pts.
- A normal ECG supports above
- Look out for atrial fib, prolonged QT intervals, WPW
- Look out for other signs of organic disease: Q waves, ST changes, hypertrophy

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### Palpitations-Further Workup

- Holter Monitoring
- Event Monitoring
- Echocardiogram
- CXR
- EPS Mapping

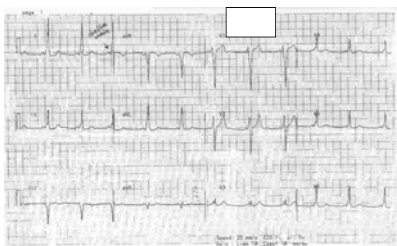
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### Palpitations - Management

- Caffeine, caffeine, caffeine, sleep
- Nutritional support of the heart
- Hepatodoron, donkey thistle, aurum stibium hyosciamus
- Beta blockade may not suppress arrhythmia but associated symptoms
- Other antiarrhythmics

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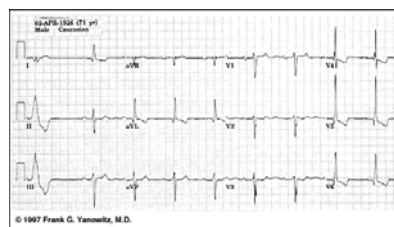
### Palpitations: Baseline ECG



Wolff-Parkinson-White

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### Palpitations: Baseline ECG



LVH with strain and LAE

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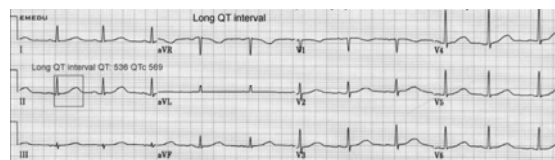
### Palpitations: Baseline ECG



Old ASMI

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### Palpitations: Baseline ECG

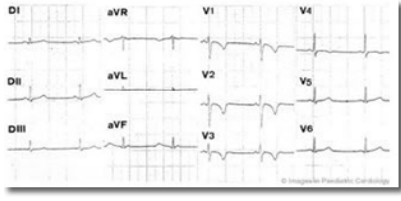


Long Q-T interval

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### Palpitations: Baseline ECG



Atrial Fibrillation

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### Palpitations: Brief Discussion on Atrial Fib

Common, especially in middle age  
 Rule out Hyperthyroidism

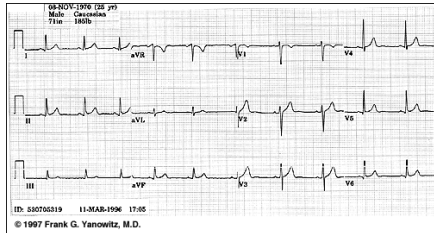
“Lone Atrial Fibrillation” – No pharmacological treatment necessary

“Intermittent Atrial Fibrillation”- Studies show high likelihood Of mural thrombi and possible embolization

“Persistent Atrial Fibrillation” – Requires anticoagulation

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### Palpitations: Baseline ECG



Normal ECG

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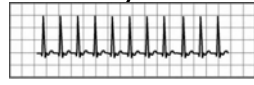
### Palpitations: ECG with Symptoms



Narrow QRS Tachycardia

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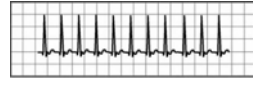
### Palpitations: Narrow QRS Tachycardia



- Regular? No → AF, AT/AFL with variable block, MAT
- Visible P waves? No → AVNRT
- Atrial rate greater than ventricular rate? Yes → AT/AFL
- Short RP interval? AVNRT, AVRT, AT
- Long RP interval? AT, PJRT, Atypical AVNRT

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### Palpitations: Narrow QRS Tachycardia



Take the “Adenosine Challenge”

- Sudden termination → AVNRT, AVRT, SNRT
- Persistent A-tach, high-degree AV block → AFL, AT
- Gradual slowing, then reacceleration → ST, JT
- No change in rate → inadequate dose, VT

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### Palpitations: ECG with Symptoms

Wide QRS Tachycardia

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### Palpitations: Wide QRS Tachycardia

- Regular? No → AF/AFL/AT with BBB or AP
- Is QRS identical to that of SR?
  - Yes → SVT with BBB, antidromic AVRT
- A-V dissociation or fusion beats? Yes → VT
- QRS morphology? Bizarre → VT
- Previous MI or structural heart disease? Yes → VT

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### Palpitations: Workup

- 24 hour Holter monitor
- Continuous loop event recorder
- Echocardiogram
- Treadmill test (for sx's with or after exercise)
- E.P. testing

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### Palpitations: Management

- Reassurance
- AV node blocking meds
- Antiarrhythmic therapy
- Catheter ablation

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