

# Arrhythmia management update

## Part 1. Palpitations: to refer or reassure?

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### Introduction

Palpitations, which can be defined simply as an awareness of the heart beating, are a common symptom which can be a cause of great concern and worry to patients. Along with chest pain and hypertension, they rank among the top three indications for referral to the cardiac clinic. Most causes of palpitations, while a great nuisance, are benign and may not require any therapy beyond explanation and reassurance. Those that do require further treatment can generally be effectively controlled or even cured. Ultimately, management depends on the heart rhythm causing the palpitations (Table 1), the severity of the symptoms, and the presence or absence of structural heart disease.

### Diagnosing the underlying rhythm disturbance

#### History

The most important step is to make a precise diagnosis and a careful history will give the answer in the great majority of cases. As the term ‘palpitations’ can be used to describe many different sensations, patients should first be encouraged to describe their symptoms as accurately as possible. Terms such as ‘skipped beats’, ‘missed beats’, ‘forceful beats’ or ‘rapid beating’ are helpful pointers, while others such as ‘fluttering’ may require further elaboration.

Asking patients to mimic the heart rate and rhythm by finger tapping can be quite informative. It is surprising how often a sensation of heart racing may be caused by a normal controlled rate. Having listened to the patient, one will very frequently have to guide the history further by asking a series of questions to tease out the details. Helpful pointers are listed in Table 2.

It is important to recognise that the severity of the symptoms often does not correlate with the significance of the arrhythmia. Healthy patients may be frightened and even disabled by isolated ventricular ectopic beats, while much higher risk patients with advanced heart disease may be completely unaware of more serious arrhythmias such as atrial fibrillation and even ventricular tachycardia.

The association of dizziness, presyncope or syncope with an arrhythmia should make one alert to the possibility of a more significant cause. While patients with isolated ectopics occasionally describe some dizziness, this is usually transient. More profound or prolonged dizziness or frank syncope

**Table 1**  
**Heart rhythms causing palpitations**

- An awareness of normal sinus rhythm
- Sinus tachycardia
- Ventricular or atrial ectopics
- Regular supraventricular tachycardia
- Atrial fibrillation (or, more rarely, flutter)
- Nonsustained or sustained ventricular tachycardia

should prompt a more intensive work-up (Table 4), and one must consider a broad differential including rare conditions such as congenital long QT syndrome.

Likewise, syncope during exercise can be an ominous presenting symptom requiring careful work-up. However, it must be stressed again that the vast majority of patients with palpitations have benign conditions which require simple evaluation and complete reassurance.

#### Physical exam

In the majority of patients complaining of palpitations, the physical exam is normal. This is reassuring, especially for patients who often suspect some serious underlying condition. Rarely, one will discover an abnormality such as an atrial septal defect or hypertrophic cardiomyopathy which was not known previously. The significance of a mid-systolic click is doubtful as mitral valve prolapse has been associated with almost every form of heart rhythm disturbance over the years. Of course, older patients with atrial fibrillation may well have established heart disease which requires continuing follow-up and treatment.

#### Investigations

The different investigations that may be considered are listed in Table 3. These need to be performed judiciously. A baseline 12-lead ECG is simple and important. Again, it is usually normal (at least in the majority of young or middle-aged patients), although one is always looking out for the classical delta wave of the Wolff-Parkinson-White syndrome and must not miss more subtle abnormalities such as a prolonged QT interval. Of course, an ECG during symptoms will give a definitive diagnosis (Figure 1), but this is rarely available (except in those with sustained tachycardia). In those with persisting sinus tachycardia, TFTs and/or an FBC may be informative.

**Table 2**  
**Questions that help to tease out the cause of palpitations**

- Are the onset and offset abrupt or gradual?
- Is the heart beat regular or irregular?
- Any precipitating factors such as stress, exercise or alcohol?
- Do they occur more frequently at rest or when lying in bed?
- Any manouevres to stop them, e.g. Val salva?
- Age when symptoms first experienced?
- Frequency and duration of symptoms?
- Any associated symptoms?
- Any hospital visits or admissions?
- Any drug therapy prescribed?
- Any other cardiac conditions, prior surgery etc?
- Thyroid function tests?
- Family history of palpitations, syncope or sudden death?
- ECG recorded at time of symptoms?

Holter monitors are probably the most used (and abused) investigation. While they are simple and noninvasive, their limitations must be clearly understood. Patients with intermittent symptoms rarely have them during the monitored period (another example of Murphy's Law). Indeed, 'false positives' such as bradycardia and/or intermittent AV block in fit young people, or short runs of atrial arrhythmias and/or frequent ventricular ectopics in older patients, are documented much more frequently. These can confuse the picture and raise unnecessary concerns about the need for pacemakers or antiarrhythmic drugs. Despite these limitations, Holter monitoring does have a role and it can provide useful information on both underlying arrhythmias and heart rate profiles during waking and sleeping hours.

Event recorders are better for patients with infrequent, isolated episodes as they can be activated to record the rhythm only at the time of symptoms. Their main drawback is the quality of the ECG rhythm strip obtained, which can have a lot of artefact, especially if the patient is anxious at these times.

Echocardiography can be helpful at times, although it usually simply confirms the clinical impression of a structurally normal heart. Of course, older patients with atrial fibrillation or ventricular arrhythmias may have significant heart disease which the echo helps to define. Stress testing will occasionally show significant findings in people with exercise-induced arrhythmias, such as some forms of ventricular tachycardia or occasional cases of atrial fibrillation. However, its role is a small one.

Formal electrophysiological study is the gold standard for the diagnosis and characterisation of any sustained arrhythmia. It is most informative in patients with regular supraventricular tachycardia or those with ventricular tachycardia, and, in both cases, it may be a prelude to curative radiofrequency ablation. As yet, its role remains much

more limited in the setting of atrial fibrillation. These procedures will be discussed further in the next part of this series.

## Different arrhythmias

*The following arrhythmias are illustrated in figure 1.*

### *Normal sinus rhythm, sinus tachycardia and ventricular or atrial ectopic beats*

Some patients will develop an awareness of normal sinus rhythm which they will then describe as palpitation. This may occur in isolation although it is more often seen in association with intermittent sinus tachycardia and ectopic beats. These three problems therefore very frequently mesh into one another and together they account for the majority of patients presenting with palpitations. The diagnosis is made from the history. Very frequently, patients will be most bothered at rest or when lying quietly in bed at night. The symptoms tend to wax and wane over periods of days to weeks, often being at their worst at times of general stress.

An understanding and sympathetic approach is required. Reassurance and a careful explanation of the origin of their symptoms is the best management approach. Drug therapy is rarely helpful and often only tends to reinforce any uncertainty regarding underlying cardiac disease.

In the worst case scenario, one could then find oneself having to shift from simple beta-blockers to a series of more potent antiarrhythmic drugs (all with potentially serious proarrhythmic side-effects) in an attempt to suppress the patient's recurring symptoms.

**Table 3**  
**Investigations (see text for discussion)**

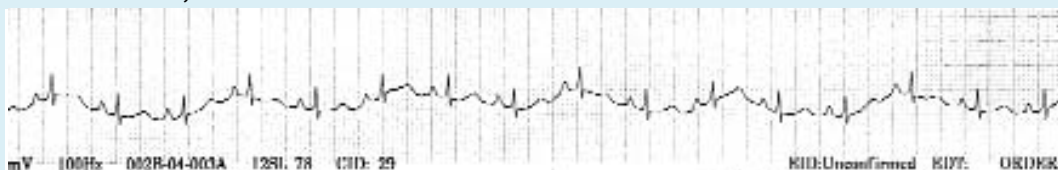
- Baseline ECG
- ECG during symptoms
- Thyroid function tests, FBC
- 24/48 hour Holter monitor
- Event recorder
- Echocardiogram
- Exercise test
- Electrophysiological study

**Table 4**  
**Patients who may merit or require specialist evaluation**

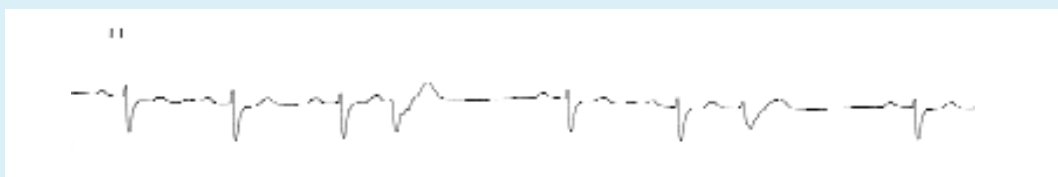
- Recurrent or sustained supraventricular tachycardia
- Associated syncope or presyncope
- Wolff-Parkinson-White syndrome
- Atrial fibrillation/flutter with unresolved management issues
- All types of sustained or recurrent nonsustained ventricular tachycardia
- Any unresolved diagnostic problem

## Figure 1: Heart rhythms causing palpitations

### 1. Sinus tachycardia



### 2. Ventricular ectopic beats



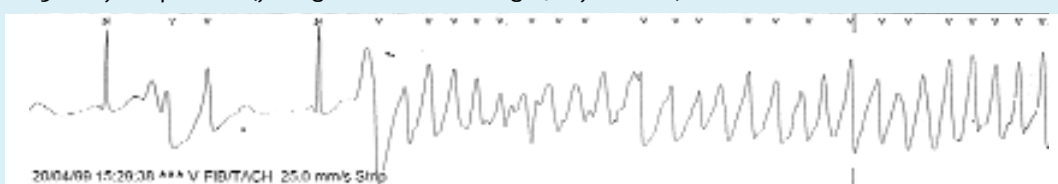
### 3. Supraventricular tachycardia



### 4. Atrial fibrillation



### 5. Polymorphic VT (young woman with long QT syndrome)



### *Supraventricular tachycardia*

Supraventricular tachycardia is a cause of rapid regular heartbeating due to reentrant arrhythmias, usually of abrupt onset and offset. Symptoms most frequently begin at a young age but patients may have intermittent episodes for their whole lives. Physical exam is usually normal. The baseline ECG may be normal or may show evidence of Wolff-Parkinson-White syndrome, and an ECG during symptoms will confirm the diagnosis. Tachycardia may be infrequent and short-lived in which case no intervention may be required. On the other hand, patients with more troublesome symptoms should be offered formal electrophysiological evaluation with a view to radiofrequency ablation which is curative in up to 98% of patients (Table 4). This will be discussed in the next part of this series.

### *Atrial fibrillation*

One of the unanswered questions about atrial fibrillation is why some patients are acutely aware of the arrhythmia while others are entirely asymptomatic. Certainly, older patients

and those with significant underlying heart disease are more likely to be found in the latter category, but one also sees some healthy and active younger patients who are asymptomatic.

For those with symptoms, the diagnosis is usually made from the history – although it can be difficult when the paroxysms are very brief. For the others, ECG documentation is required.

### *Ventricular arrhythmias*

It is intended to discuss the diagnosis and management of ventricular arrhythmias in the third and final part of this series. For the present, it is suffice to say that ventricular arrhythmias are an uncommon cause of palpitations and patients should undergo a more complete work-up to characterise or exclude any underlying heart disease and to define the arrhythmia further by formal electrophysiology study.

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