INVESTIGATION OF SYMPTOMS OF PALPITATION

KEY POINTS:

1. Arrhythmia Patients may simply have an electrical fault in their heart. The rest of the heart function can still be completely normal. An arrhythmia does not imply the risk of a heart attack, (coronary thrombosis leading to myocardial infarction). An electrical condition can occur alone. Many, but not all, of such patients have a low risk to life.
2. Patients with Wolff-Parkinson-White Syndrome have palpitations and may have just an electrical fault caused by an accessory pathway, which will usually show up of a 12-lead resting ECG as ventricular pre-excitation. Such patients have a 2% risk of sudden cardiac death, and many are young.
3. Many patients with palpitations and a structurally normal heart can be completely cured using catheter ablation techniques, (see Chapter 14, 16, 18).
4. Arrhythmias may also occur in patients whose hearts have been structurally damaged, e.g. by a previous heart attack, heart valve dysfunction, heart muscle weakness or muscle overgrowth. Such patients are often at greatly increased risk of sudden cardiac death due to a life-threatening arrhythmia.
5. Patients with arrhythmias and structural heart disease should be assessed by a cardiologist for management of the underlying heart disease, risk of sudden cardiac death, and risk reduction by heart drugs and an ICD. These patients require referral to a cardiac electrophysiologist for management of symptoms with a hybrid approach that may involve anti-arrhythmic drugs, ICD and catheter ablation.

INTRODUCTION

Many patients present with palpitations, and the cause ranges from anxiety to a life-threatening arrhythmia. The key to good management is a careful history to determine whether the palpitations is very transient or sustained for minutes, hours or days, whether there is any history of heart disease, and whether there is any history of sudden premature cardiac death in close relatives. Examination should seek to determine the presence of any underlying heart disease. Investigation should always include a 12-lead resting ECG with appropriate report, over-read by a suitably qualified person if it is not normal. Even patients with structurally normal hearts may be at risk of sudden cardiac death [1], and those with damaged hearts should be assessed in secondary or tertiary care.

DEFINITION OF PALPITATION

"Awareness of an abnormal heart beat."

Patients with palpitation commonly fall into four groups:

- Very transient awareness of disturbance of rhythm
- A normal heart rate and rhythm with enhanced perception
- Sustained (i.e. more than a second or two) rapid regular heart rhythm
- Sustained rapid irregular heart rhythm

VERY TRANSIENT DISTURBANCE OF RHYTHM

Such abnormal rhythms are almost always the results of the intervention of ectopic or "extra" beats. These may arise from the "supraventricular" myocardium above, or the "ventricular" myocardium below. Extra beats are very common. They are often not felt in the peripheral pulses, for example, at the wrist. They are followed by a compensatory pause before the next normal heart beat. This pause is a normal reflex mechanism. When patients fail to appreciate the ectopic beat, and then appreciate the pause, the net effect is for patients to perceive a prolonged pause, often accompanied by a transient awareness of the heart "flip-flopping" in the chest. Commonly, there is also transient breathlessness, and even chest pain.

Many patients become terrified that their heart *"is about to stop".* Such concern raises adrenalin levels, raises stress and increases the number of ectopic beats experienced. This may result in the stress of worry about the heartbeat actually making the problem worse. In the absence of structural heart disease, such ectopic beats are very unlikely to have any prognostic significance, and rarely need treatment. They often settle once adequate time is made by a doctor to explain what is causing the symptoms. Such provision of time is very cost-effective, though it might occasionally require re-enforcement by ECG recording and sometimes ambulatory ECG monitoring.

A resting 12-lead electrocardiogram, with appropriate report, is mandatory.

A MARKED AWARENESS OF A NORMAL HEARTBEAT

A marked awareness of the heart beat with normal rate and rhythm is usually associated with a degree of anxiety. This will respond to the exclusion of organic disease, (e.g. hyperthyroidism, anaemia), reassurance, and establishing a psychological or social cause, as appropriate. A resting 12-lead ECG is mandatory, and occasionally, ambulatory ECG monitoring may be needed for reassurance.

A resting 12-lead electrocardiogram, with appropriate report, is mandatory.

SUSTAINED, RAPID, REGULAR PALPITATIONS

Patients with sustained episodes of rapid regular palpitations may have sustained supraventricular or ventricular arrhythmias.

History taking should focus on:

- the conditions under which the arrhythmia starts,
- whether it starts suddenly,
- some idea of the rate and rhythm, (which a patient can tap out on a table),
- the duration, and
- whether the stopping of the fast rhythm is sudden or gradual.

An arrhythmia that is prolonged over minutes, not seconds, and starts and stops suddenly, suggests a genuine electrophysiological mechanism, or "short circuit". Usually, in the absence of structural heart disease, such patients may have one of the common forms of "supraventricular tachycardia". However, a history of cardiac disease is significant, e.g. a previous myocardial infarction. Some sustained regular

tachycardias are life-threatening, especially where there is significant underlying structural heart disease [2-11].

The key to effective modern management is the electrocardiographic recording of the heart rhythm during symptoms, i.e. symptom/ECG correlation. This may prove elusive, however. Prolonged attacks of tachycardia resulting in A&E attendance or hospital admission will provide ECG evidence, and also help select patients who should be considered for early referral for effective modern treatments. In the USA, the first-line treatment for the common forms of supraventricular tachycardia is curative radiofrequency catheter ablation, established now for over 15 years [12-14]. In the UK, with much scarcer resources, medical therapy will be often be advised first. Failure of medical therapy to adequately control symptoms without significant side-effects should prompt a tertiary referral for consideration of catheter ablation.

Abnormal resting 12-lead electrocardiography, or palpitation in the presence of significant ischaemic heart disease, heart failure, heart muscle disease, or heart valve disease, should prompt referral to a cardiologist in secondary care. Such patients need further investigation to characterise the type and extent of underlying structural heart disease and assess the risk that palpitations are indicative of a potentially life-threatening arrhythmia. Direct access echocardiography and ambulatory ECG monitoring, if available, may allow primary care physicians to evaluate patients. Such tests help in selecting out those patients with significant heart disease for further investigation. Such investigations reduce the burden on secondary care, and could be made available through training Cardiology GPSIs in primary care.

Some patients with these symptoms may have ventricular pre-excitation. which is an ECG appearance suggestive of an accessory electrical connection (or “accessory pathway”) between the atria and the ventricles which can form an electrical short circuit. This condition is also called the Wolff-Parkinson-White (WPW) syndrome, first described in 1930 [15]. Ventricular pre-excitation may be evident in most, but not all, cases of WPW syndrome. Some pathways are latent and are not always evident on a resting ECG [16].

A resting 12-lead electrocardiogram, with appropriate report, is mandatory.

SUSTAINED RAPID IRREGULAR PALPITATIONS

Patients complaining of sustained irregular palpitations may be found to have established atrial fibrillation, or suspected of having paroxysmal atrial fibrillation. The presence of structural heart disease, ischaemic heart disease, heart muscle disease, valve disease or heart failure increase the potential risk to life and risk of important complications of atrial fibrillation. Questioning and investigation should be directed towards establishing and characterising underlying heart disease in primary care, or referral for evaluation in secondary care. Thirty per cent of all strokes are found to be associated with atrial fibrillation, (see chapter 13). Atrial fibrillation should be confirmed electrocardiographically and managed according to the guidelines elsewhere in the forthcoming NSF and NICE Guidelines.

A resting 12-lead electrocardiogram, with appropriate report, is mandatory.

STANDARDS OF CARE FOR PATIENTS PRESENTING WITH PALPITATIONS

Primary Care Questioning:

- are symptoms very transient for a second or two, or sustained for longer?
- are palpitations are regular or irregular?
- any history of underlying cardiac disease?
- any family history of arrhythmia or premature sudden death?

Primary Care Investigation:

- A resting 12-lead electrocardiogram, with appropriate report.
- obtain symptom/ECG correlation if possible
- establishing and characterise the presence of significant structural heart disease

When to Refer On:

- Inability to establish symptom/ECG correlation or fully characterise significant structural heart disease

Secondary Care Investigation:

- obtain symptom/ECG correlation if possible
- establishing and characterise the presence of significant structural heart disease

Secondary Care Management:

- Medical therapy appropriate to the ECG diagnosis
- treat underlying heart disease if any to reduce risks and manage symptoms

When to Refer On:

- Offer curative catheter ablation if available for; supraventricular tachycardia, atrial flutter, some ventricular arrhythmias and some cases of atrial fibrillation especially after failure of medical therapy
- if significant underlying structural heart disease cannot be adequately risk-assessed for sudden cardiac death
- if significant underlying structural heart disease cannot be adequately treated according to guidelines elsewhere in this document which could include a hybrid approach with ICD, antiarrhythmic and other cardiac drugs, and even catheter ablation treatment in some cases

Investigation in Tertiary Care:

- adequately risk-assess for sudden cardiac death if significant underlying structural heart disease present

Treatment in Tertiary Care:

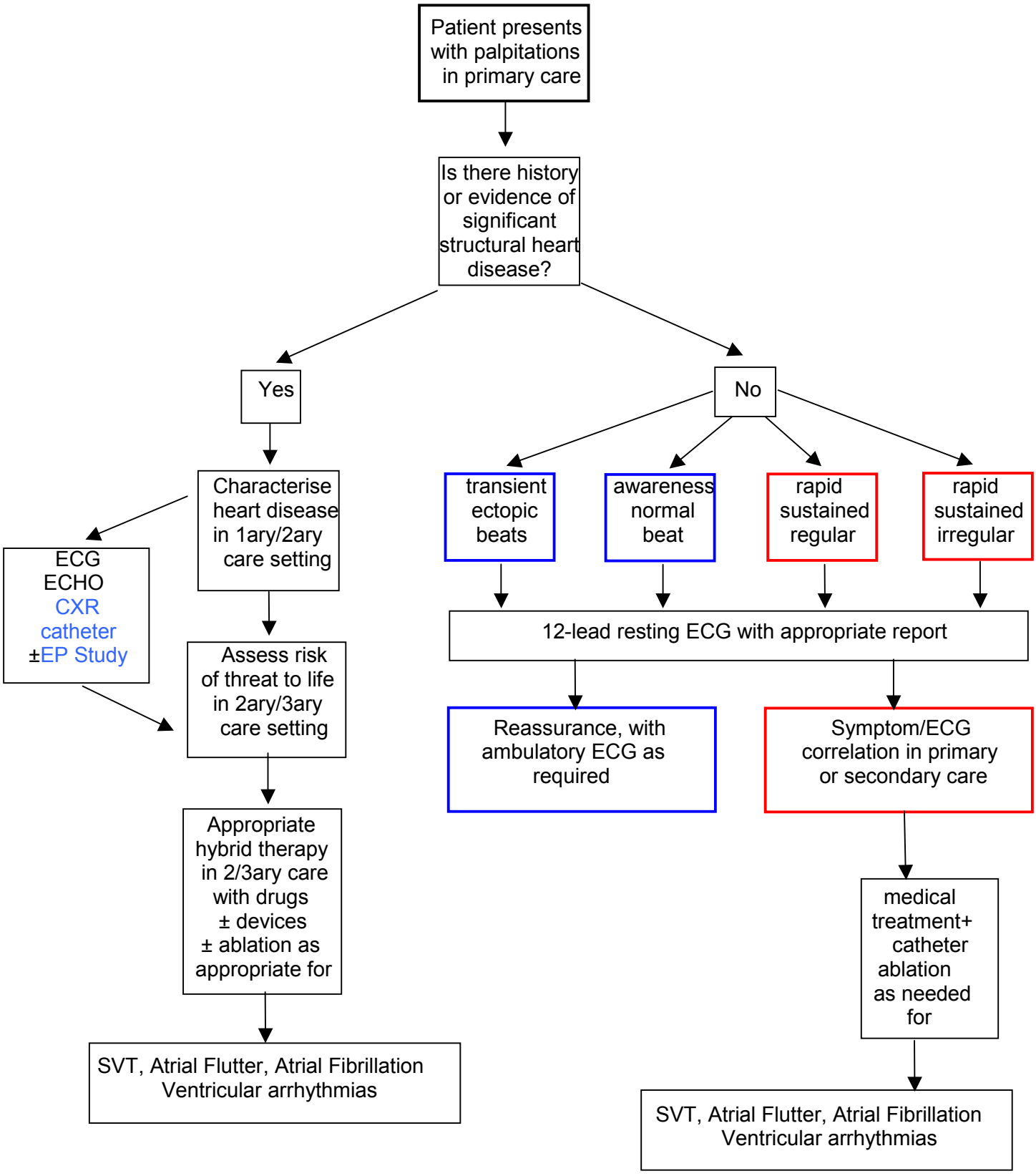
- treatment of supraventricular tachycardias, atrial flutter or atrial fibrillation, and some ventricular tachyarrhythmias by catheter ablation
- institute hybrid therapy to reduce risk and treat symptoms safely if significant underlying structural heart disease is present

Evolution of Levels of Arrhythmia Care

In accordance with the perspective in the Fifth Report of the BCS and the RCP on Cardiology Services, some traditional “tertiary” arrhythmia treatments such as ICD implantation and follow-up may become routine treatments available in secondary care

when appropriate training, staffing and facilities are in place to support such activities, (see Chapter 30, 31, 32, 33).

A CARE-PATHWAY FOR PATIENTS WITH PALPITATIONS



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STANDARDS FOR INVESTIGATION OF PALPITATIONS

Standard 1. Patients with palpitations *in the absence of structural heart disease* should have symptom/ECG correlation established wherever possible.

- Palpitations caused by ectopic beats require explanation and reassurance.
- Patients with sustained supraventricular tachycardia may be treated with medicines and should be offered the option of curative catheter ablation.
- Patients with atrial fibrillation should be evaluated for medical therapy and anti-coagulation and be fully appraised of the option of catheter ablation if symptoms warrant it.

Standard 2. Patients with palpitations *and structural heart disease* should be referred for evaluation of their structural heart disease in secondary/tertiary care and receive advice and treatment for risk reduction for life-threatening arrhythmias and sudden cardiac death. They should have treatment for their underlying structural heart disease and safe treatment of their arrhythmias to address their symptoms, which may involve hybrid therapy with antiarrhythmic drugs, implantable cardiac rhythm management devices and catheter ablation as appropriate.

Standard 3. Patients with palpitations and suspected arrhythmias should have at least one, high-quality, 12-lead resting ECG with an appropriate report. A computerised “normal” report is acceptable. Otherwise, the ECG should be reviewed by an experienced doctor.

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LAY SUMMARY

INVESTIGATION OF SYMPTOMS OF PALPITATION

Palpitation is awareness of the heart beating. Normally we are not aware of this. Palpitations may signal the presence of abnormal heart rhythms, or “arrhythmias”. If these occur in the absence of any other abnormality of the heart, then in many cases these arrhythmias are not life-threatening. However, this is not true in all cases. Patients may have an electrical fault in the “wiring” of the heart and yet have no other abnormality of the heart at all. In some cases such abnormalities may give rise to life-threatening fast rhythms. If this is due to an abnormal conduction pathway in the heart, then the risk can be assessed by cardiologists, (heart specialists), with special training in heart rhythm care, (cardiac electrophysiologist or arrhythmologist). Many of the abnormal rhythms caused by an abnormal conduction pathway can now be completely cured using keyhole techniques. This is done under local anaesthetic to access the heart via the veins, identify and localise the abnormal pathway, and cauterise it with an electric current, (catheter ablation). This typically causes minimal damage and usually only mild discomfort. This discomfort can be eased with sedative and pain-killing drugs. In other cases, even if the structure of the heart appears normal, there may be electrical faults that are determined by inheritance through the family, and these effect all the heart muscle. In this situation, a cure is impossible, but the threat to life must be assessed and treated appropriately. Treatment may be with drugs and special implantable pacemakers capable of a life-saving shock if needed, (ICDs). The exact treatment is assessed and advised by the cardiologist or cardiac electrophysiologist.

Patients with palpitations should be assessed by their own doctor for the likelihood of the need for further investigation in the local hospital or in a centre with a cardiac electrophysiologist. Some simple questioning can help determine if this is needed. Simple tests, such as a resting heart trace, (ECG), or a longer term heart trace, for a day or several days, may also help. Other tests are needed if a patient has a history of heart disease, such as a previous heart attack, (coronary thrombosis), heart failure, or an abnormal heart valve. Abnormal heart rhythms that occur when the heart is diseased by such other causes may be more life-threatening. If a threat is suspected by the doctor, the patient should be evaluated by the local cardiologist and/or a cardiac electrophysiologist.

Nowadays it is fairly easy to determine whether palpitations are serious and need treating, or if reassurance will do. Many arrhythmias are completely curable, and when this is the case, patients should not have to live with the problem, but should be referred to an appropriate specialist. Patients at high risk similarly deserve skilled care.

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