Management of Palpitations in Urgent Care

Urgent message: Patients with palpitations often present to urgent care clinics. Making the correct diagnosis requires knowledge of underlying pathophysiology and thorough differential diagnosis.

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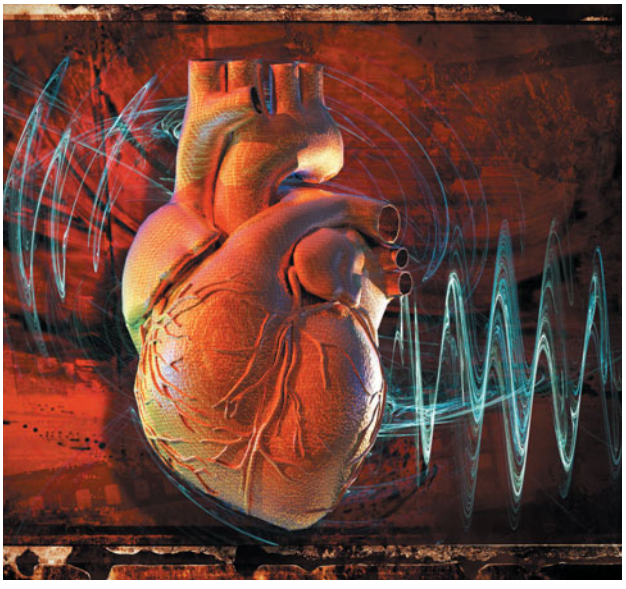
Case Record

A 75-year-old woman with no prior history of cardiac disease complained of "palpitations" but neither lightheadedness nor syncope. She denied excess caffeine intake or use of illicit drugs and had no other significant past medical history on triage. The patient's initial blood pressure measurement was noted to be 105/74 mmHg and heart rate 190 BPM. An electrocardiogram (ECG) was obtained **(Figure 1)**. The patient was conversant but appeared uncomfortable. Her blood pressure was rechecked 3 minutes after the initial reading and remained in a similar range. The patient reported "tidiness in the chest."

Introduction

Palpitations are a common reason for urgent care visits. Aside from what the brain interprets as abnormal heartbeats, patients may complain of a sensation of rapid, pounding, skipped or irregular heartbeats. The causes of palpitations range from benign to serious and proper history-taking and thorough evaluation are warranted to explore underlying etiology in a patient and establish a management plan. Arguably most patients' palpitations are not explained by any serious cardiac condition, but an urgent care provider may want to explore cardiac causes for any such complaints. In some cases, further evaluation is of little use in explaining underlying etiology. Besides increasing medical costs, further testing may cause anxiety in patients and their families. Therefore, in urgent care, the decision whether to proceed with further evaluation and management should be guided by focused history and physical examination.



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Medical Literature on Palpitations

Palpitations—described as a sensation of pounding heartbeats—are an unpleasant feeling that leads patients to seek medical attention.[1-3] In most cases, palpitations

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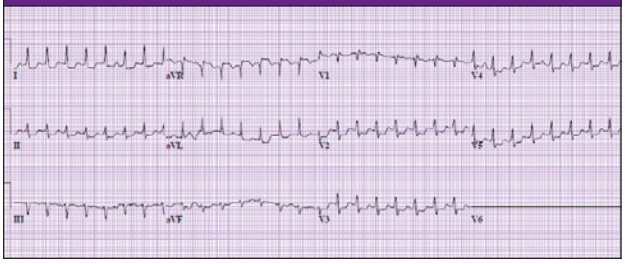
Figure 1. Initial ECG



do not imply pathological arrhythmias.[4] However, urgent care providers need enough knowledge about etiology to identify patients in whom palpitations may be associated with life-threatening etiology.

In their systematic review, Thavendiranathan et al concluded that a known history of cardiovascular disease increases likelihood of malignant arrhythmia and life-threatening events in the setting of palpitations.[4] Similarly, data from the Netherlands showed that patient characteristics play an important role in predicting cardiac arrhythmias in those who present with palpitations to their general practitioners.[2,5]

Position papers from multiple medical societies recommend a structured workup, based on findings from a detailed history and physical examination, along with utilization of less expensive surveillance tools, such as ECG. [6] The universal recommendation is to use the least expensive diagnostic tool before proceeding to further cardiac monitoring, metabolic and endocrine workup, or advanced imaging.[7] The exception is in the case of clear evidence that a patient suffers from a cardiac arrhythmia and a life-threatening risk is imminent.[8]

Causes of Palpitations

A variety of conditions may be responsible for causing palpitations. Data on these causes in an urgent care setting are not readily, but the differential diagnosis should include cardiac and non-cardiac conditions. Cardiac causes of palpitations include electrical pulse abnormalities, such as increased automaticity of the cardiac conduction at any level of the system pathway or reentry phenomena via accessory pathway and structural cardiac diseases that can precipitate arrhythmias. Patients with malfunctioning pacemakers and implantable cardioverter defibrillators also can present with complaints of palpitations. In these specific situations, the possible etiologies consist of hardware failure or pacemaker-mediated tachycardia (PMT) caused when a device senses an atrial pulse and generates ventricular stimulation.

Stimulant substances and many medications can result in cardiac conduction excitation and subsequently lead to palpitations. In addition, many of the most commonly used medications—specifically neuroleptics and antiemetics—can lead to QT Interval prolongation as a causal pathway to Torsades de Pointes ventricular tachycardia. Hence, urgent care providers should be well-informed about the adverse effects of such treatment and know how to address secondary palpitations in these patients.

Moreover, neuropsychiatric disorders, endocrine gland diseases (both hyposecretion and hypersecretion states) increase heart rate. In addition, physiological responses to increased body temperature, decreased intravascular volume, and electrolyte imbalance should be considered as reversible causes of palpitations.

Presentation and Initial Evaluation

Initial evaluation and testing of patients with palpitations should be guided by the likelihood of a cardiac etiology, based on patient history and physical examination **(Table 1)**. Further urgent management should be contingent upon a patient's concomitant presentation and hemodynamic profile. A wide variety of concomitant symptoms can accompany a non-specific complaint of palpitations, which could determine further evaluation. For example, dizziness or syncope in the setting of palpitations is a concerning presentation for cardiac arrhythmias. Patient demographics—specifically age and past medical history—also are helpful in determining the possible cause and further risk stratification. In adolescents, for instance, palpitations usually are benign and often explained by hormonal changes in this population. In rare adolescents, a true presentation of arrhythmia is concerning for structural congenital heart disease or hereditary cardiac conduction disorders. Conversely, in adults with cardiac disease, the presentation of dizziness and palpitations may be indicative of ventricular arrhythmia. We suggest that initial evaluation of palpitations include ECG and basic laboratory testing (if available in the urgent care center) and outpatient cardiac event monitoring when a patient is hemodynamically stable.

ECG Evaluation

Twelve-lead ECG is the cornerstone of arrhythmia diagnosis in the setting of palpitations and a necessity for documentation and treatment. Although single-lead monitors alone are inadequate and can be misleading, debated exists about use of ECG as a first-line surveillance tool. Recommendations from professional medical soci-

Table 1: Triage and Management of Palpitations in Urgent Care

Initial Rapid Assessment and Triage
- Any tachycardia should be taken seriously, and to a lesser degree for sinus tachycardia in anxiety, dehydration, etc.
- Vital signs determine the severity index for rapid triage
- Rapid triage should focus on medical history highlights

Provider History and Exam
- Concurrent clinical history: chest pain, SOB, Syncope, etc.
- Exam: focus on neurologic, cardiac, pulmonary findings

Initial Diagnostic Approach
- ECG
- Electrolytes
- TSH
- Cardiac enzymes
- BNP or NT-proBNP
- Digoxin level when applicable
- Urine drug screen
- Imaging: Chest x-ray
- Continuous closed-loop, Holter and trans-telephonic event recording monitors

Management
- Place patient in acute bed with cardiac monitor and DC pads
- Obtain IV access
- Initiate CAB protocol if hemodynamic profile becomes unstable.

Management of Unstable Palpitations
- Establish CAB protocol
- Convert or not convert if arrhythmia affected the stability of vital signs
  - Clinical decision: Explore coexisting etiologies (ACS, PE, CVA, etc.)
  - Dependent on stability of the case
  - Temporary solution
- Alert ED/cardiac unit
- Secure transfer to facility

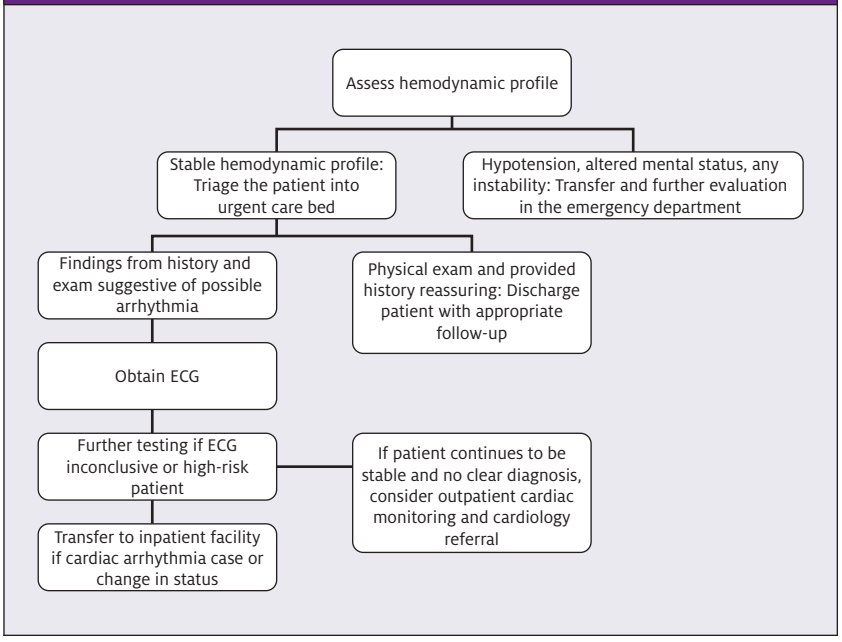
ACS = acute coronary syndrome; BNP = brain natriuretic peptide; CAB = chest compressions, airway, breathing; CVA = cardiovascular accident; ECG = electrocardiogram; ED = emergency department; IV = intravenous; NT-proBNP= N-terminal prohormone brain natriuretic peptide; PE = pulmonary embolism; SOB = shortness of breath; TSH = thyroid stimulating hormone

eties acknowledge that a patient's clinical picture and presentation will determine the indication for ECG.[9] Routine testing at the time of the complaint carries only 30% to 60% variability in determining the diagnosis.[10]

The key to accurate diagnosis and subsequent treatment is having a reasonable knowledge of ECG along with relevant clinical presentation and laboratory findings.[11] Recommendations from the American College of Cardiology (ACC) and the American Heart Association (AHA) emphasize that ECG should be done for validation of arrhythmia when a patient's clinical presentation suggests a cardiac cause.[9,11]

Automated readings in ECG machines use built-in software that does not always provide an accurate diagnosis. Specific arrhythmias may be over-read or not accurately diagnosed. In clinical practice, there is an accumulated body of evidence that outpatient ECGs should be stored or transmitted to a central station for diagnosis confirmation and future documentation.

Figure 2. Suggested Workflow for Palpitation Triage and Evaluation



Laboratory and Imaging Approach After Initial Evaluation and ECG

Guided by the available triage data, an urgent care provider may consider further testing to explore the cause of a patient's palpitations. The general initial approach can include a basic metabolic panel and complete blood count to investigate electrolyte abnormalities or anemia and screening for thyroid disease with measurement of thyroid-stimulating hormone. If a cardiac condition such as myocardial infarction or congestive heart failure is suspected, adding serum cardiac biomarkers and measuring digoxin level (when available) may be critical when triage of a patient and transfer to a hospital are needed. Chest x-ray is highly specific but has low sensitivity for screening tool for cardiopulmonary diseases. Urine drug screen can guide diagnosis in patients in whom illicit drug use is suspected. In such cases, true arrhythmias, and specifically ventricular tachycardia, are in the differential diagnosis.

In patients with complaints of persistent palpitations complaint who remain stable, Holter and closed-loop event monitoring can be considered.[12] This approach should follow the initial evaluation and probably ECG to rule out structural and valvular heart disease. Referral to a cardiac electrophysiological clinic should be considered for test interpretation and further management.

It is important to note that in some patients, extensive workup will not yield a definite diagnosis, even when complaints of palpitations are recurrent and require multiple urgent care visits. Further evaluation should be guided by a patient's clinical data and presence or absence of true cardiac arrhythmia, particularly in the current environment of value-based medicine and cost-effective approaches.

Triage of Palpitation and Further Management

Patients with hemodynamic instability require urgent transfer to a hospital **(Figure 2)**. Transfer also is required when cardiac arrhythmia is documented on ECG or even suspected and accompanied by altered mental status or chest pain in patients with known coronary artery disease. Successful risk stratification of patients with palpitations on initial evaluation in an urgent care clinic will expedite triage and facilitate initiation of an appropriate protocol.

Once a patient is stable, further testing can be considered while he or she is observed in the urgent care clinic. Referral to outpatient cardiology consultation for data review and advance assessment may be helpful in patients with intermittent but benign arrhythmias.

Clinical Case Course

For our patient, a vagal maneuver was attempted (in this case, it was carotid massage, but a valsalva maneuver, orbital pressure, and ice on the face are other options). After the maneuver failed, adenosine was given (0.1 mg/kg IV push followed by 10-mL saline flush). The patient returned to sinus rhythm and was transferred to a hospital for further evaluation and consultation by the cardiology service.

Case Record Discussion

Our patient presented with supraventricular tachycardia (SVT), a common cause of palpitations in younger indi-

viduals that carries a favorable prognosis. SVT is commonly known as AV re-entrant tachycardia (AVRT), but it is also caused by increased automaticity in the atrium. The differential diagnosis includes a wide variety of rhythms that trigger the electrical pulse above the ventricular conduction system, but without ventricular involvement. Examples include AV nodal re-entrant tachycardia (AVNRT) in which a secondary pathway is present. Other AVRT anomalies include Wolf-Parkinson-White syndrome, in which AV blockers can stimulate the conduction and cause ventricular activation.

Conclusion

Palpitations represent a nonspecific presentation of cardiac and noncardiac conditions. Triage, urgent care management, and further disposition of a patient with palpitations depends on the patient's history, physical examination, and clinical presentation. In an urgent care clinic, cardiac monitoring and ECG may help provide an accurate diagnosis while a patient is waiting for further work-up or transfer to a tertiary care facility. Having a protocol in place to address all potential fatal arrhythmias in an urgent care setting is important. ■

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