

Investigating palpitations

1. What is the best way to investigate palpitations?

Question submitted by Dr. Garth S.J. Verbonac, Scarborough, Ontario

The assessment of palpitations begins with key items elicited from the patient's history. The duration of symptoms, along with a description of onset and offset, can help to discern frequent ectopy from tachycardia as the underlying issue. Information must also be elicited regarding the frequency of episodes and accompanying symptoms.

If tachycardia is suspected, irregular palpitations may indicate atrial fibrillation—a problem of increasing prevalence as the population ages. Atrial fibrillation requires proper anticoagulation in certain high-risk groups for the prevention of embolic stroke.

Subsequent investigations should include a physical examination and electrocardiogram to assess the patient for evidence of structural heart disease or conduction abnormalities. The presence of either should prompt referral to a

specialist; an echocardiogram is often useful for further assessment. Bloodwork may also indicate an underlying cause, making tests for thyroid and renal function, complete blood count and electrolytes reasonable to consider.

Ultimately, the cardiac rhythm must be documented during symptoms to reach a firm diagnosis. In the rare setting of daily symptoms, this can be achieved by Holter monitoring. However, it is more often diagnostic to provide a longer-term monitoring device. The patient activates the device at the time of symptoms, storing data that is then transmitted over the telephone line for assessment. Such recorders, which are becoming increasingly available at cardiac investigation centres, can be worn externally for weeks at a time or implanted under the skin for longer periods of monitoring.

Once diagnosis is made, management is the next challenge. Ectopy is largely benign but can be quite symptomatic, occasionally requiring medical therapy. Tachycardia in the presence of normal cardiac structure and function is also generally benign and can be treated expectantly, with medication or by catheter ablation. Wide complex tachycardia, or any tachycardia in the presence of abnormal cardiac structure or function, usually warrants referral to a specialist.

Answered by:

Lorne Gula, MD, FRCPC
 Clinical Cardiac
 Electrophysiologist
 London Health Sciences
 Centre
 Assistant Professor of
 Medicine
 University of Western Ontario
 London, Ontario

Examining ECHO

2. What is the sensitivity and specificity of transthoracic ECHO compared to right-heart catheterization for PAH?

Question submitted by Dr. Neil Skjodt, Edmonton, Alberta

Right heart catheterization, although invasive, still remains the gold standard in the diagnosis of pulmonary arterial hypertension (PAH). Transthoracic echocardiography (ECHO) is the most practical and reliable noninvasive tool to screen for the disease.

The sensitivity and specificity of Doppler ECHO for the diagnosis of PAH ranges from 79% to 100% and 60% to 98%, respectively. At least 10 studies have reported correlation coefficients between right ventricular systolic pressure estimated from the tricuspid regurgitation jet and hemodynamic right-heart catheterization values. Nine of these studies reported statistically significant correlations, with an average correlation coefficient of 0.82.

Hence, transthoracic ECHO, as an adjunct to clinical evaluation, is a reasonable

screening approach to identify patients with PAH. However, in about 10% to 15% of patients, ECHO cannot provide a good assessment of the pulmonary artery because of a poor imaging window (chronic obstructive pulmonary disease, obesity) or an insufficient tricuspid regurgitation jet, leading to the need for right-heart catheterization in selected patients.

Answered by:

Abdullah Alshehri, MD
Cardiology Resident
UBC Cardiology Training Program
University of British Columbia
Vancouver, British Columbia

Kenneth Gin, MD, FRCPC
Director
UBC Cardiology Post-Graduate Training Program
Clinical Associate
University of British Columbia
Associate Director
Echocardiography
Associate Director
Coronary Care Unit
Vancouver General Hospital
Vancouver, British Columbia

Resources

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Lowering digoxin

3. Should lowering digoxin level be based on the existing digoxin level, creatinine clearance, body mass, or age?

Question submitted by Dr. Peter Noble, Oshawa, Ontario

Lowering digoxin should be based on a combination of elements. The first question I would have is: Does the patient need to be on digoxin? We currently have excellent rate-controlling agents and heart failure medications—remember that digoxin has no data indicating reduction in mortality.

Digoxin level can only be interpreted if taken at least six hours after the last dose. A person's threshold for digoxin toxicity is lower when they are on chronic digoxin therapy and have a lower glomerular filtration rate (which takes body

mass and age into account). An important note about weight is that low body mass is associated with higher rates of toxicity.

Therefore, I think it is important not to only look at digoxin levels when considering toxicity, but to take into account comorbid conditions, kidney dysfunction, advanced age and other medications.

Answered by:

Payam Dehghani, MD,
CCFP, FRCRC
Cardiology Fellow
University of British Columbia
Vancouver, British Columbia



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Juice truth

4. Do I have to tell all my patients on statins to avoid grapefruit juice? Are there other juices to avoid?

Question submitted by Dr. Naomi Ecob, Lindsay, Ontario

Grapefruit juice has been shown to affect the metabolism of several drugs. The mechanism of the drug interaction appears to result primarily from the inhibition of CYP3A4 in the intestinal wall. Research also suggests that grapefruit juice might be an inhibitor of C-glycoprotein, which inhibits the absorption and increases the excretion of drugs.

Several constituents of grapefruit juice have been implicated and, unfortunately, the content of these constituents varies between different grapefruit juices, making it impossible

to determine if one juice is safer than another. For drugs that are significantly impacted by the interaction, one eight-ounce glass of grapefruit juice is enough to cause an effect that lasts for up to three days.

In addition to grapefruit juice, many researchers are warning that the fruit itself could cause problems. Health Canada is now advising consumers not to drink grapefruit juice or eat grapefruit in any form if they are taking medications that might interact. Other fruits and fruit products potentially implicated for drug inter-

actions are Seville oranges, tangelos and lime juice. Most other citrus fruits, such as lemons, citrons, naturally sweet oranges and tangerines, are considered safe. The only statins considered safe to use with grapefruit ingestion are fluvastatin, pravastatin and rosuvastatin. [Read](#)

Answered by:
Bruce Josephson, MD, FRCP

Associate Professor
Department of Medicine
Division of Cardiology
Dalhousie University
Halifax, Nova Scotia

