

4.2.2. Ambulatory Electrocardiography

Recommendation for Ambulatory Electrocardiography Referenced studies that support the recommendation are summarized in Online Data Supplements 3 and 4.		
COR	LOE	Recommendation
I	B-NR	1. Ambulatory electrocardiographic monitoring is useful to evaluate whether symptoms, including palpitations, presyncope, or syncope, are caused by VA. ^{S4.2.2-1–S4.2.2-4}

Recommendation-Specific Supportive Text

1. Ambulatory electrocardiographic monitoring is often used to assess the effectiveness of treatments to suppress arrhythmias, but more robust data are needed on the clinical use of this practice. Continuous or intermittent ambulatory electrocardiographic recording with a Holter monitor or an event recorder is helpful in diagnosing suspected arrhythmias, establishing their frequency, relating them to symptoms, and assessing the response to therapy. Although the yield of these tests is relatively low, VT is occasionally documented.^{S4.2.2-4} A 24-hour continuous Holter recording is appropriate when symptoms occur at least once a day or when quantitation of PVCs/NSVT is desired to assess possible VA-related depressed ventricular function. For sporadic symptoms, event or “looping” monitors are more appropriate because they can be activated over extended periods of time and increase diagnostic yield.^{S4.2.2-2,S4.2.2-3} Adhesive patch electrocardiographic monitors can record for weeks and allow for continuous short-term 1-lead monitoring and patient activation for symptoms. Studies have shown satisfactory patient compliance, and arrhythmia detection; however, with some monitors, detected arrhythmias are not discovered until the patch is returned for analysis.^{S4.2.2-1,S4.2.2-4} Serial evaluations with exercise testing and/or 24-hour ambulatory monitoring are also used to assess rhythm burden and response of VA to therapy. Notably, implantable monitors are covered in Section 4.2.3. Importantly, when the suspicion of VA in a patient is high, outpatient ambulatory monitoring is inappropriate as prompt diagnosis and prevention of VA are warranted. It is important to accurately correlate the symptoms with the arrhythmias detected by ambulatory ECG monitoring.

4.2.3. Implanted Cardiac Monitors

Recommendation for Implanted Cardiac Monitors Referenced studies that support the recommendation are summarized in Online Data Supplement 5.		
COR	LOE	Recommendation
Ia	B-R	1. In patients with sporadic symptoms (including syncope) suspected to be related to VA, implanted cardiac monitors can be useful. ^{S4.2.3-1–S4.2.3-4}

Recommendation-Specific Supportive Text

1. Implanted cardiac monitors provide continuous rhythm monitoring and stored recordings of electrograms based on patient activation or pre-set parameters, allowing a prolonged monitoring period of a few years. These devices require a minor invasive procedure with local anesthesia for implantation. In patients with sporadic symptoms, including syncope, implantable recorders are useful in diagnosing serious tachyarrhythmias (including VA) and bradyarrhythmias.^{S4.2.3-2–S4.2.3-4} They are generally reserved for patients in whom other ambulatory monitoring is nonrevealing due to the infrequency of events. A 25% added yield in diagnosis has been described after an unrevealing external ambulatory monitor.^{S4.2.3-5} In a study of patients with syncope, the implantable monitor had a greater diagnostic yield than “conventional” testing with external monitoring, tilt table testing and electrophysiological study.^{S4.2.3-2} A systematic review in patients with syncope concluded that use of these devices provide a higher rate of diagnosis and a trend toward reduction in syncope relapse after diagnosis, as compared with conventional management.^{S4.2.3-3} A prospective study of patients after MI, with LVEF <40%, demonstrated NSVT (>16 beats long) in 13%, VT (>30 s) in 3% and VF in 3% of patients.^{S4.2.3-1} It is important to accurately correlate the symptoms with the arrhythmias detected by implanted cardiac monitors.

4.2.4. Noninvasive Cardiac Imaging

Recommendations for Noninvasive Cardiac Imaging Referenced studies that support the recommendations are summarized in Online Data Supplement 6.		
COR	LOE	Recommendations
I	B-NR	1. In patients with known or suspected VA that may be associated with underlying structural heart disease or a risk of SCA, echocardiography is recommended for evaluation of cardiac structure and function. ^{S4.2.4-1,S4.2.4-2}
Ia	C-EO	2. In patients presenting with VA who are suspected of having structural heart disease, cardiac magnetic resonance imaging (MRI) or computed tomography (CT) can be useful to detect and characterize underlying structural heart disease.

Recommendation-Specific Supportive Text

1. Assessment of global and regional myocardial function, valvular structure and function, along with assessment for adult congenital heart