Sudden Cardiac Arrest Association
Power and passion, saving lives

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FACT SHEET: Diagnostic Testing for Patients at Risk for SCA

A doctor, generally a cardiologist or electrophysiologist, may conduct a series of tests to diagnose patients and determine risk level, treatment options, and indications for implantable cardioverter device (ICD) therapy. These include:

- Electrocardiogram
- Echocardiogram
- Holter Monitor
- Event Recorder
- Electrophysiology Study (EPS)
- Cardiac catheterization
- T-wave alternans (TWA) Test

An **Electrocardiogram**, often called an EKG, is a painless and common test that records the electrical activity of the heart. It produces lines called "waveforms" that a clinician may view on a monitor or print on paper. When divided into time segments, these waveforms are used to measure the rate of movement of the heart's electrical impulses.

An **Echocardiogram** is a non-invasive, safe and effective test to study the anatomy of the heart. It uses sound waves (ultrasound) to form images of the structures of the heart. An "echo" is used to evaluate the size of the different chambers of the heart, the quality of the valves, measure the heart's pumping ability and identify other problems of the heart that may increase a person's risk for dangerous arrhythmias.

Holter Monitor is a portable heart monitor that is worn by patients to monitor heart rhythms over a period of time. Patients wear a small recording box attached to their chest by five adhesive electrode patches for 24-48 hours.

An **Event Recorder** is a portable heart monitor that is worn by patients to monitor heart rhythms over a period of time. When patients experience symptoms, they activate the event record to take a snapshot of their heart's activity as they are symptomatic. This is useful for patients with relatively infrequent and brief symptoms.

During an **Electrophysiology Study**, an electrophysiologist specifically provokes arrhythmia events in the patient in a controlled clinical environment. During the study, data about the flow of electricity during actual events is collected. As a result, EP studies can help locate the specific areas heart tissue that give rise to the abnormal electrical impulses that cause arrhythmias. This detailed electrical flow information provides valuable diagnostic and, therefore, treatment information.

A **T-wave alternans (TWA) test** is used to detect a subtle electrical abnormality in the EKG that is linked to increased risk of dangerous arrhythmias. It is a non-invasive test

that requires the patient to wear electrodes on the torso while walking for 5-7 minutes on a treadmill to elevate the heart rate.