



# Implantable Loop Monitors

## Patient Perspective

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### How Can More Information on My Heart Rhythm Help Me and My Healthcare Provider?

Symptomatic palpitations and passing-out spells, otherwise known as syncope, are 2 of the most common presentations to emergency departments and cardiology outpatient offices. Heart rhythm abnormalities, or cardiac arrhythmias, can be the reason some people experience recurrent palpitations, dizziness, or even syncope. These events can be episodic with no clear triggers, hence making diagnosis difficult and frustrating for patients and their providers. Cardiac arrhythmias can result from abnormally slow heart rates, fast heart rates, or even profound pauses in the heart rate attributable to electric disease and short-circuits of the electric circuitry of the heart.

### How to Diagnosis Heart Rhythm Abnormalities?

For years, the mainstay in diagnosing heart rhythm abnormalities has been hospital or outpatient monitoring from

home via monitors placed on the chest wall that record the heart rhythm. Typically, these monitors can be worn anywhere from 24 hours up to 30 days. Continuous looping monitors can automatically record heart rhythms that reach a programmed threshold of slow or fast heart rate, even without the need for the patient to push any buttons to manually record. Nonlooping monitors are best suited for patients with sustained episodes that last  $\geq 1$  minute. These monitors have no wires or adhesive patches. The monitor is placed against the chest wall, and with the press of a button manual recordings of the heart rhythm can be made. Unfortunately, the yield of these approaches can be limited by compliance issues in wearing the adhesive patches or difficulty sleeping while wearing bulky monitors, with limited yield if no symptoms or events are noted during the timeframe of monitoring.

### What Is an Implantable Loop Monitor?

An implantable loop monitor is, as it sounds, a USB-sized device that can be

### Table. Who Is a Candidate for an Implantable Loop Monitor

Patients with any of the following symptoms or conditions

- Symptomatic recurrent palpitations
- Passing out spells, or syncope
- Recurrent dizzy spells

To evaluate for atrial fibrillation—an irregular heart rhythm that increases the risk of stroke

implanted just underneath the skin, left of the breastbone. This device can serve as a literal continuous ECG-recording machine, recording a patient's heart rhythm for up to 3 years. The biggest advantage of this system is for patients who have symptoms that are not that frequent—that is, patients who may present with syncope once every several months or even yearly, in which case short-term external monitors have limited utility (Table). In addition, the issue of patient compliance in tolerating bulky external monitors is eliminated. These small devices are contained in a metal alloy casing with an internal battery and microchips for recording and storage of the tracings of your heart rhythm (Figure 1).

The information contained in this *Circulation* Cardiology Patient Page is not a substitute for medical advice, and the American Heart Association recommends consultation with your doctor or healthcare professional.

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### What to Expect the Day of the Implant?

Implantation of an implantable loop monitor is primarily performed in a hospital or ambulatory surgical setting to allow for sterile antiseptic technique with local and moderate sedation as necessary. On the day of the procedure, you will meet with your implanting physician and review the plans for sedation. Typically, you will receive some intravenous sedatives to relieve any anxiety that you may experience before this short procedure. Thereafter, your chest area, just left of your breastbone, will be sterilely cleaned and shaved with special antiseptic solution. A small incision of  $\approx 1$  to 2 cm will be made in this area with creation of a pocket, or space, for insertion of the implantable monitor just underneath the skin. On average, the procedure lasts 20 to 30 minutes, with absorbable sutures to secure the wound close.

### What to Expect After the Implant?

Your physician will typically see you in 1 to 2 weeks after the procedure to ensure proper wound healing. At that time, you and your physician will devise a plan suited to your need for clinical follow-up to review the infor-

mation stored on your implantable monitor. Typically, the device is checked every 3 months or more often, as dictated by recurrent clinical symptoms. This device check is called an interrogation and can be done in your physician's office or remotely from home over a landline telephone. This is accomplished by placing a special wand on your skin over the site of the device to allow for wireless radiofrequency communication to download the recorded ECG strips to a local computer called a programmer. These heart rhythm strips can be viewed in real-time and stored on your physician's computerized chart system. Your device can be programmed via this wireless communication system by your physician to set cut-off limits of low and high heart rates that can trigger the device to record instantaneous electrocardiograms to look for any abnormal heart rhythms (Figure 2).

### Living With My Device

No special care is needed after the wound site has healed weeks later. An identification card will be sent to your home, akin to a license, with your name, your physician's name, and the model and make of your implantable loop monitor listed for you to keep close to you. This is beneficial and

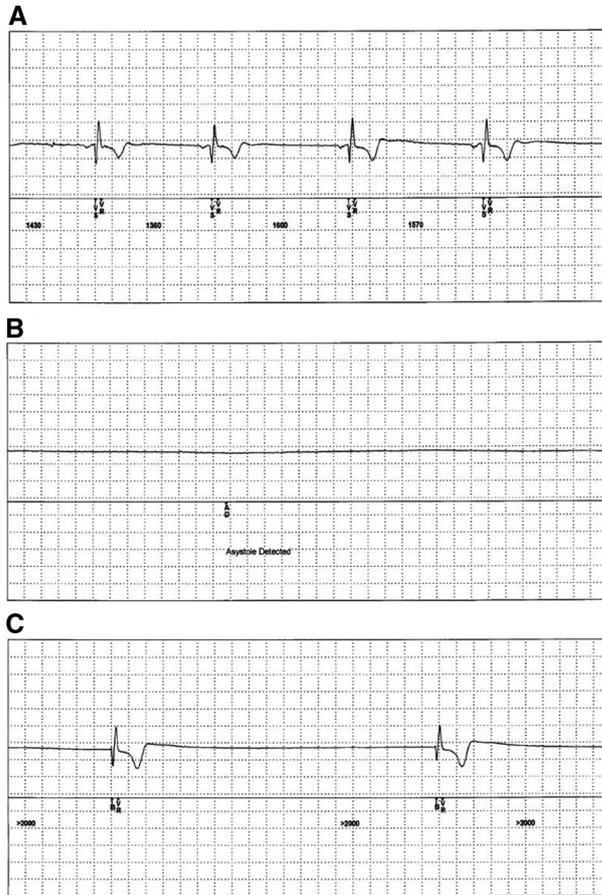
necessary when you are traveling by plane and need to go through metal detectors; these devices are only recording devices and do not emit any signals and are safe for travel and transit through metal detectors. Other times, you will need to have this card and information handy if you present to an Emergency Department with a clinical episode of syncope, dizziness, or palpitations, so the hospital physicians can have your device checked for any recorded abnormal heart rhythms. No special precautions are needed during daily activity with microwaves, wireless phones, antitheft detectors at stores, or handheld digital devices.

### When to Remove the Monitor?

The typical battery for an implantable loop monitor can continue to record your heart rhythm for up to 2 to 3 years. It is advisable to keep the device in place until your clinical symptoms have recurred frequently enough to allow for adequate correlation with the device's recordings of your heart rhythm. If you have a clinical event and the implantable loop monitor records a heart rhythm disturbance, you may be recommended for further testing or therapeutic procedures. This can include a possible recommendation for a permanent pacemaker implant, possibly an implantable cardiac defibrillator, or sometimes a diagnostic electric study of your heart followed by a therapeutic procedure in an attempt to cure you of any recurrent abnormal heart rhythms. In addition, abnormal heart rhythms that have implications for risk of stroke, such as atrial fibrillation, can also be detected; if so, institution of blood thinning anticoagulation medication to mitigate and reduce that risk may be a possible outcome. Finally, once adequate clinical information has been gleaned, your device can be removed at any time with a similar procedure as performed at the time of implantation. Again, after sterile technique, the site of previous incision can be used to remove



**Figure 1.** Image of U.S. Food and Drug Administration–approved implantable loop recorders for the diagnosis of unexplained syncope. A St. Jude Confirm loop monitor is noted at the top left with the Medtronic Reveal loop monitor at the top right. A pen is pictured at the bottom of the image as a size reference.



**Figure 2.** Sample tracing obtained from a patient's implantable loop monitor during a device check after a passing-out spell, or syncope. **A**, Baseline heart rate of 45 bpm. **B**, Initiation of a long pause, or asystole, is noted, lasting throughout the tracing and denoted as the flat line without any ECG complexes. This pause lasts  $\approx 9.5$  seconds. **C**, There is a slow resumption of the heart rhythm after the prolonged pause, denoted by the 2 ECG complexes.

the device with subsequent closure with absorbable sutures.

### Additional Resources

<http://www.medtronic.com/patients/fainting/device/index.htm>

<http://www.sjmprofessional.com/Products/US/Implantable-Cardiac-Diagnostics/SJM-Confirm-Implantable-Cardiac-Monitor.aspx>

<http://www.hrsonline.org/patientinfo/symptomsdiagnosis/hearttests/looprecorder/>

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