



**Medtronic**

**REVEAL LINQ™**

**INSERTABLE CARDIAC MONITOR AND PATIENT ASSISTANT**



**Patient Manual**

**Caution:** Federal law (USA) restricts this device to sale by or on the order of a physician.

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Medtronic, Medtronic CareLink, MyCareLink, Reveal, Reveal LINQ, TUNA.

## **How to contact Medtronic**

### **Contact us by phone**

Our experienced Patient Services group is available to answer any questions or concerns you may have about your heart device. To speak directly with a Patient Services Specialist, call 1-800-551-5544. Our staff is available Monday through Friday from 8:00 AM to 5:00 PM (Central Time).

### **Contact us online**

Medtronic is dedicated to providing you with the most up-to-date information available about your Medtronic heart device. Website information is available 24 hours a day.

- Medtronic website: [www.medtronic.com](http://www.medtronic.com)
- Patient Services website: [www.medtronic.com/rhythms](http://www.medtronic.com/rhythms)

If you would like to submit questions, suggestions, or requests to us online, you can use the online form provided at [www.medtronic.com/contact-us](http://www.medtronic.com/contact-us).

**Contact us by mail or fax**

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# 1 Overview

Your doctor should be your first source of information regarding your health. This manual addresses many of the questions you or your family may have about your cardiac monitor. If you have questions that are not covered in this manual or you want more in-depth information about your cardiac monitor, contact Medtronic (see page 3).

## **Overview of the Medtronic Reveal LINQ system**

Your doctor has recommended a Medtronic Reveal LINQ insertable cardiac monitor system. The Reveal LINQ system allows your heart's electrical activity to be continuously monitored while you are away from your hospital or clinic. The system consists of your inserted cardiac monitor, the MyCareLink Patient Monitor that you generally keep by your bedside for automatic daily monitoring, and a handheld device called the Patient Assistant that you carry with you to easily record information about any heart-related events you experience. Table 1 provides an overview of the Reveal LINQ system.

**Table 1.** Overview of how the Reveal LINQ system is used to monitor and diagnose symptoms



The Reveal LINQ cardiac monitor senses your heart rate continuously and, as programmed by your doctor, automatically stores heart-related events.



If you experience a symptom such as dizziness, fainting, or palpitations, then during or very soon after experiencing a symptom, you press the button on the Patient Assistant and hold it over your cardiac monitor.



Your heart doctor can monitor you by having the data from your cardiac monitor transmitted automatically to your clinic daily through your bedside MyCareLink Patient Monitor, if your doctor prescribed one.



**Table 1.** Overview of how the Reveal LINQ system is used to monitor and diagnose symptoms (continued)



Your doctor can also monitor you through in-office clinic appointments. Your doctor will make sure your cardiac monitor is working correctly and review the data saved in the cardiac monitor.

Next are additional details on the Reveal LINQ system components.

## **Cardiac monitor**



The Reveal LINQ cardiac monitor is inserted under your skin, generally in your left chest area. The cardiac monitor, shown above, is only about 1.8 in (4.5 cm) long, is less than 0.3 in (0.7 cm) wide, and it is very thin. It will likely be minimally noticeable under your skin.

While you go about your daily activities, the cardiac monitor keeps track of your heart's electrical activity. Recordings are stored based on your doctor's programmed settings. Your doctor can use these recordings and information from you about your symptoms to help monitor, diagnose, and manage heart rhythm disturbances (called arrhythmias), or to determine if your symptoms are related to something else. Your symptoms may include syncope (fainting), light-headedness, dizziness, and palpitations (sensations of an unduly rapid or irregular heartbeat).

The cardiac monitor records an electrocardiogram (ECG), which is a pattern of your heart's electrical activity. Your doctor can review the stored ECG, which helps to show if your heart's rhythm is too slow, too fast, irregular, or normal.

There are two ways the cardiac monitor stores this ECG information for your doctor to review later:

- ECG recordings stored when you or a caregiver uses the Patient Assistant.
- Automatic ECG recordings based on how your doctor has programmed the cardiac monitor. Your doctor can tell you how many recordings your cardiac monitor is programmed to store.

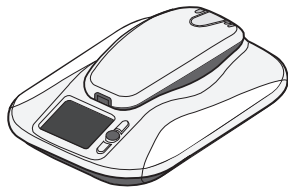
Talk with your heart doctor about when you should have the data from your cardiac monitor read.

## Patient Assistant



The Patient Assistant model 9538 is a small, handheld device about the size of a pager. Carry it with you at all times so that you have it whenever you experience symptoms. As instructed by your doctor, you use it to record (mark) heart rhythm information in your inserted cardiac monitor while, or just after, having symptoms. Data is stored in the cardiac monitor, not the Patient Assistant. For detailed instructions, see “Using your Patient Assistant” on page 21.

## MyCareLink Patient Monitor



The MyCareLink Patient Monitor is an electronic device that makes it easy and automatic for your doctor to obtain information that is recorded in your cardiac monitor. The MyCareLink Patient Monitor gathers this information to allow your doctor to manage your care and determine if any of your symptoms are related to your heart rhythm.

Once you have set up the MyCareLink Patient Monitor and completed an initial manual transmission, the MyCareLink Patient Monitor is designed to automatically gather information daily from your heart. This automatic wireless communication between your cardiac monitor and the MyCareLink Patient Monitor takes place at times scheduled by your clinic, typically while you sleep. For more information, see “Remote monitoring with the Medtronic CareLink Service and MyCareLink Patient Monitor” on page 17.

## **Frequently asked questions**

Here are some answers to questions that new patients frequently ask. Contact your doctor or Medtronic if you have additional questions.

### **How long will I have my cardiac monitor inserted?**

Your doctor will decide how long you need the cardiac monitor. The battery is designed to last approximately 3 years.

### **What if my symptoms are not related to my heart rhythm?**

Then your doctor looks for other causes. For example, syncope (commonly called fainting) is sometimes hard to diagnose because fainting may be related to fatigue, stress, hormonal imbalance, neurological abnormalities, or other causes. If you do not have heart rhythm problems, your doctor can focus on other potential causes or refer you to another doctor.

### **Why do I need a device identification card?**

Your Medtronic device identification (ID) card has information about you, your doctor, and your cardiac monitor in case you have a medical emergency or have a medical question. An ID card is attached to your Patient Assistant Quick Reference Card. Carry it with you at all times.

### **What if I am scheduled for a medical procedure?**

Before any medical procedure, always show your Medtronic device ID card so medical personnel are aware that you have an implanted medical device. For more information about medical procedures that require precautions, such as magnetic resonance imaging (MRI) scans, see “Medical procedure warnings and precautions” on page 51.

### **What if I need to travel?**

When you travel, continue to use your Patient Assistant and MyCareLink Patient Monitor as instructed and always carry your cardiac monitor ID card. For information on passing through security systems such as at the airport, see “Security systems” on page 50. Consult with your cardiac monitor doctor before your travel for an extended period of time. Your doctor can make sure your cardiac monitor transmissions are adjusted for time zone differences, if necessary, before and after you travel. To contact Medtronic, see page 3 or the back cover of this manual for contact information worldwide.

### **Are there things my family and friends should know?**

They should learn how to use the Patient Assistant so that they can assist you, if needed (see “Using your Patient Assistant” on page 21).

# 2 The insertion procedure, recovery, and follow-up

## The insertion procedure

The insertion procedure for your cardiac monitor does not require major surgery. This simple procedure can generally be done within 15 to 20 minutes. Here are the general steps of an insertion procedure:

1. **The incision is made.** Local anesthesia is used to numb the incision site. You can compare it to the numbing of your gums in your dentist's office. Your doctor will make a small incision in the skin at a location that is suitable for your situation.
2. **The cardiac monitor is inserted.** The cardiac monitor is inserted under the skin. Your doctor tests the cardiac monitor to confirm that it is operating correctly.
3. **The incision is closed.** Your doctor will close the incision and explain how to care for your incision area.

## Potential risks after the insertion procedure

**Caution: Contact your doctor or nurse if you notice any swelling, warmth, or drainage around your incision or if you develop a fever while your incision is healing.**

- As with any kind of surgery, there is the potential risk of infection.
- Tell your other doctors that you have a cardiac monitor. They may choose to prescribe antibiotics for you to take before and after any surgery to prevent infection.

## Recovering after your procedure

As you recover, follow your doctor's suggestions about resuming normal activities. You may see or feel a slight bulge under your skin where the cardiac monitor is located.

When you are driving or riding in a vehicle, the seat belt strap that fits over your shoulder may feel uncomfortable. You can place a soft towel between the shoulder seat belt strap and your insertion site to cushion the area during the first few weeks after the insertion procedure. In any case, seat belts should be worn at all times.



## **Follow-up appointments**

Before you leave the hospital, your doctor will tell you if you need to schedule a follow-up appointment. A follow-up appointment usually takes the same amount of time as a regular doctor's appointment.

A follow-up appointment serves the following purposes:

- Assess your general medical condition
- Check the operation of your cardiac monitor
- Review the information saved by your cardiac monitor
- Adjust your cardiac monitor settings, if necessary
- Review instructions on using the Patient Assistant (see page 21)

## **Remote monitoring with the Medtronic CareLink Service and MyCareLink Patient Monitor**

The Medtronic CareLink Service is convenient. You do not have to leave your home for most follow-up appointments. The service allows you to send your cardiac monitor information over a cellular line to your clinic at a time set up by your doctor, instead of visiting your clinic in person. If the cardiac monitor information that is sent to your doctor indicates

that you should be seen in person, your doctor or clinic will contact you to set up an appointment.

If your doctor prescribes this service, a Medtronic MyCareLink Patient Monitor will be given to you at your clinic or sent to your home address. The patient monitor is lightweight, small, and easy to take with you if you plan to travel. The patient manual provided with the monitor contains details on setup and usage.

### **Required distance between the MyCareLink Patient Monitor and the Reveal LINQ cardiac monitor**

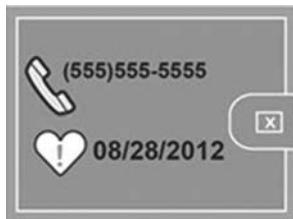
To ensure successful transmissions of the data in your cardiac monitor to your clinic, the MyCareLink Patient Monitor must remain plugged in to a power outlet and be no more than 6.5 ft (2 m) away from your inserted cardiac monitor when a transmission occurs. Your clinic will typically schedule daily transmissions while you sleep. Placing the patient monitor on a night stand next to where you sleep is an easy way to ensure successful transmissions (see Figure 1).



**Figure 1.** Place the MyCareLink Patient Monitor no more than 6.5 ft (2 m) away from you to ensure successful transmissions

## MyCareLink Patient Monitor screens and Reveal LINQ

The patient manual included with the MyCareLink Patient Monitor describes screens that may be displayed on the patient monitor for all supported cardiac devices. Described below are the additional screens that may appear for Reveal LINQ cardiac monitors and may require action by you:



When you see this alert screen (colored orange on your patient monitor), call the displayed phone number so that your health care provider can determine if you experienced a heart-related event. Your clinic has also been notified. Press the button next to the X to dismiss the alert.



This screen (colored blue) indicates the most recent date that the data from your cardiac monitor was successfully transmitted to your clinic.

# 3

## Using your Patient Assistant

### What is the Patient Assistant?

The Patient Assistant is handheld, battery-operated device about the size of a pager. Carry it with you at all times so that you have it whenever you experience a symptom. You use it to record (mark) heart rhythm data in your inserted cardiac monitor while, or just after, having a symptom, as instructed by your doctor. Data is stored in the cardiac monitor, not the Patient Assistant. Your doctor uses the data to check your heart rhythm and to help determine if your symptoms are heart related. Examples of symptoms (sometimes called “events”) include fainting, palpitations, seizures, or similar episodes.

This chapter provides instructions on using, handling, maintaining, and other information about the Patient Assistant.

## Patient Assistant button and indicators

The Patient Assistant has a button and two indicators. The indicators appear (illuminate) only after you press the button. Table 2 describes the button.

**Table 2.** Patient Assistant button and description


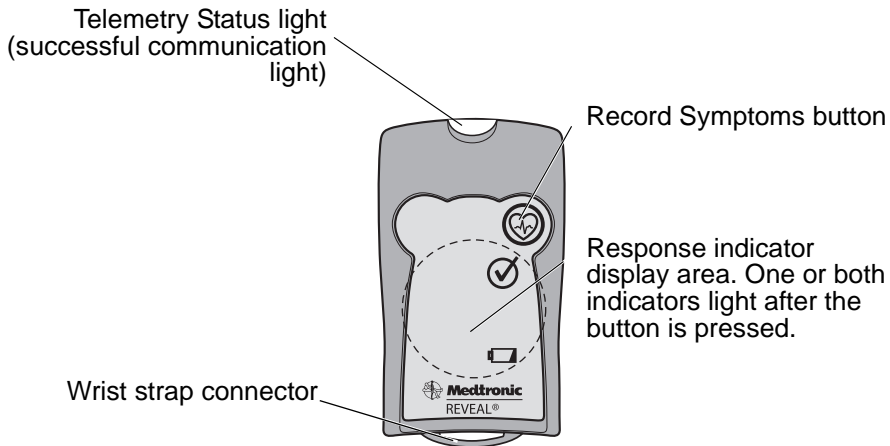
Button	Description
	<b>Record Symptoms button.</b> Press this button while you are having a symptom or as soon as possible afterward, as directed by your doctor. Pressing this button stores heart rhythm information for your doctor's analysis.

Figure 2 shows the button, indicators, and other parts of the Patient Assistant. The indicators that can light after you press the button are described in Table 3 on page 27.



**Figure 2.** Patient Assistant

## Instructions from your doctor

Use the spaces below to record your doctor's instructions.

Press the Record Symptoms button [  ] to record heart rhythm information in the following situations:

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Contact your doctor or clinic in the following situations:

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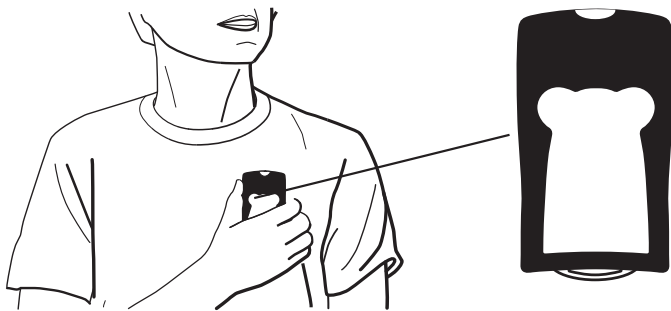
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## Using your Patient Assistant

You or a helper should follow these steps while you are having symptoms or as soon as possible afterward, as directed by your doctor:



1. Press and release the **Record Symptoms** button [  ]. You should hear a short beep and see the Telemetry Status light flashing green (Figure 2 shows where the light is located).
2. While the Telemetry Status light is flashing, hold the Patient Assistant up to your cardiac monitor. The side with the button can be held facing you or away from you (see Figure 3). Your cardiac monitor may be inserted in a different location than shown here.



**Figure 3.** Hold the Patient Assistant in front of your cardiac monitor

3. The Telemetry Status light changes from a flashing light to a solid light and you hear a long beep.
4. Quickly look at the Patient Assistant response indicator display area to see if one or both indicators are lit. An indicator stays lit only for a few seconds. Table 3 describes the indicators and any action to take.

**Table 3.** Record Symptoms button [  ] indicators

Indicator	Description/Action to take (if any)
	<b>Successful Recording indicator.</b> This indicator means you have successfully recorded heart rhythm data in your cardiac monitor memory.
	<b>Check Batteries indicator.</b> This indicator means the Patient Assistant batteries are low and must be replaced. See page 30 for instructions.

## Troubleshooting

If you have difficulty using your Patient Assistant, see Table 4 on page 28 to determine if one of the described problems occurred and follow the corrective action provided. If you still have trouble, contact Medtronic (see page 3).

**Table 4.** Problems, possible causes, and possible solutions

**Problem:** Telemetry Status light stops flashing without a response after the button is pressed.

**Possible cause:** Insufficient telemetry; the Patient Assistant did not communicate with the cardiac monitor. **Possible solution:** Reposition the Patient Assistant directly over the cardiac monitor, press the button again, and wait for a response.

**Possible cause:** Electromagnetic interference. **Possible solution:** Move away from the source of interference (an electrical or magnetic item).

**Possible cause:** Component failure. **Possible solution:** Contact your doctor or clinic to replace the Patient Assistant.

**Problem:** Telemetry Status light turns a solid color, beeps, but no response indicator appears in the display area.

**Possible cause:** The light in the display area is broken or there is a component failure. **Possible solution:** Contact your doctor or clinic to replace the Patient Assistant.

**Possible cause:** The light in the display area went on and off before you looked at it. **Possible solution:** Look at the indicator display area sooner.

**Table 4.** Problems, possible causes, and possible solutions (continued)

**Problem:** Telemetry Status light flashes, but no beep sounds.

**Possible cause:** The speaker has failed or the area is too noisy to hear the beep.

**Possible solution:** Try using the Patient Assistant in a quieter area; if you still do not hear a beep, contact your doctor or clinic to replace the Patient Assistant.

**Problem:** Telemetry Status light does not flash and no beep sounds.

**Possible cause:** Batteries are inserted incorrectly. **Possible solution:** Reinstall the batteries (see page 30).

**Possible cause:** Batteries are depleted. **Possible solution:** Replace the batteries.

**Possible cause:** Wrong type of batteries are inserted. **Possible solution:** Verify that batteries are N-size, 1.5 V.

**Possible cause:** Component failure. **Possible solution:** Contact your doctor or clinic to replace the Patient Assistant.

**Table 4.** Problems, possible causes, and possible solutions (continued)

**Problem:** The Patient Assistant continues to fail to communicate or respond.

**Possible cause:** The Patient Assistant is outside its temperature range: 49 °F (9 °C) to 110 °F (43 °C). **Possible solution:** Move to warmer or cooler surroundings.

**Possible cause:** Electromagnetic interference. **Possible solution:** Move away from the source of interference (an electrical or magnetic item).

**Possible cause:** Batteries are low or depleted. **Possible solution:** Replace the batteries.

**Possible cause:** The Patient Assistant needs to be replaced. **Possible solution:** Contact your doctor or clinic to replace the Patient Assistant.

## Battery replacement and disposal

When the Check Batteries indicator light is on (see Table 3 on page 27), replace the batteries in your Patient Assistant as soon as possible (see page 31). The Patient Assistant uses two N-size 1.5 V batteries. The recommended battery type is alkaline manganese dioxide, type ANSI/NEDA 910A and IEC LR1, which can be purchased at retail and camera stores and from online merchants.

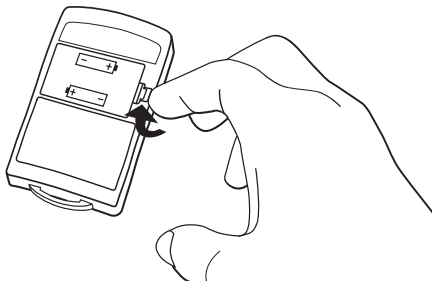
Follow local regulations for proper disposal of used batteries.

## Replacing the batteries

Use only the recommended batteries for the Patient Assistant. Using different batteries could damage the Patient Assistant.

Follow these steps to replace the batteries in your Patient Assistant:

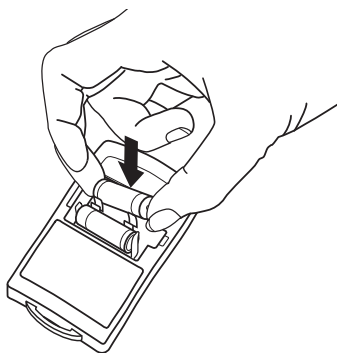
1. Slide the battery cover tab toward the center of the Patient Assistant and push upward to open the battery compartment (see Figure 4).



**Figure 4.** Opening the battery compartment

2. Remove the old batteries.

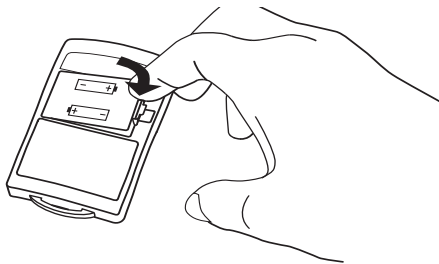
3. Insert two new batteries according to the polarity diagram shown in the battery compartment (see Figure 5). See page 30 for required battery size and type.



**Figure 5.** Insert new batteries

4. Snap the battery cover closed (see Figure 6).



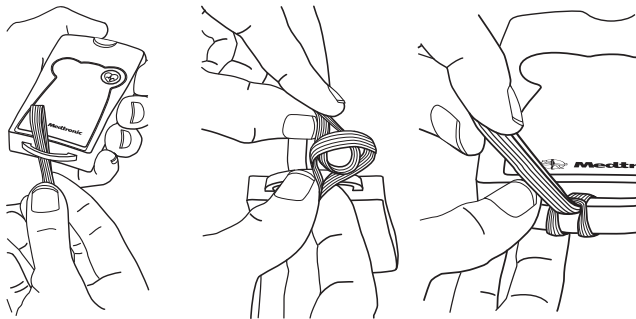


**Figure 6.** Close battery cover

5. To determine if the batteries were installed correctly, hold the Patient Assistant away from your cardiac monitor (to avoid recording any data) and press the Record Symptoms button. The Patient Assistant should beep and the Telemetry Status light should flash green, confirming correct battery installation. If you press the button and the Telemetry Status light does not flash green, make sure you have installed the new batteries correctly. If you need further assistance, contact your hospital or clinic.

## Attaching the optional wrist strap

You can attach the provided wrist strap to your Patient Assistant and hang the strap around your wrist to ensure the Patient Assistant is always accessible and not dropped. Attach the wrist strap as shown in Figure 7. You can also attach the strap to the loop on the provided carrying case.



**Figure 7.** Attaching the optional wrist strap

## Handling your Patient Assistant

The Patient Assistant is designed for daily use, and precautions should be taken to avoid damaging it.

- Do not immerse the Patient Assistant in liquid or spill fluid on it.
- Do not drop or mishandle the Patient Assistant in any way that might cause damage. If the Patient Assistant has been dropped and does not function, contact Medtronic (see page 3).
- Do not open the Patient Assistant except to install the batteries.
- Do not carry the Patient Assistant in a pocket located directly in front of your cardiac monitor. Use the supplied carrying case if you carry your Patient Assistant in your pocket or handbag.
- Keep the Patient Assistant at room temperature. The Patient Assistant may not operate at full strength outside the range of 49 °F (9 °C) to 110 °F (43 °C).

## Maintenance and cleaning

Regularly inspect the Patient Assistant for damage or defects. If it is damaged or if you cannot troubleshoot a problem, call your hospital or

clinic for assistance. The Patient Assistant does not require periodic safety tests.

Be careful to prevent moisture from entering the Patient Assistant. The Patient Assistant is moisture resistant but not waterproof. Clean the outside of the Patient Assistant with a soft, slightly damp cloth, as needed. Do not clean the Patient Assistant with solvents (for example, nail polish remover) or chlorine-based cleansers (for example, bleach). While cleaning, be sure not to let any water get into the enclosure. Let the enclosure completely dry before operating.

## **Disposal**

Do not dispose of this product in the unsorted municipal waste stream. Dispose of this product according to local regulations. The Patient Assistant contains materials that can harm the environment.

## **Warnings and precautions**

**Warning** – Seek medical attention immediately if you are feeling ill and think you might need to go to the hospital. If there is an emergency, call your local emergency number. If your doctor has provided other

instructions, follow them. Waiting to seek medical attention could be dangerous to your health.

**Warning** – To ensure the safe operation of the Patient Assistant, use the Patient Assistant only as described in this manual. Save this manual.

**Warning** – Do not modify this equipment. Modifications may impact the effectiveness of the Patient Assistant and adversely affect your safety.

**Caution** – Use the Patient Assistant only as directed by your doctor. Do not “play” with your Patient Assistant, including unnecessarily pressing the Record Symptoms button, because doing so can cause previously recorded data to be lost.

## **Patient Assistant specifications**

**Dimensions:** Approximately 3.77 in x 2.20 in x 0.86 in (96 mm x 56 mm x 22 mm)

**Power source:** 2 N-size, 1.5 volt batteries, alkaline (manganese dioxide)

**Battery dimensions:** 0.39 in x 1.18 in (10 mm diameter x 30 mm)

**Battery longevity:** When used at room temperature, a Patient Assistant button can be pressed a minimum of 180 times over 6 months with a

minimum of 5 minutes between button presses, before a low battery is indicated. Operating the Patient Assistant below 60 °F (15 °C) for extended periods of time shortens battery longevity.

**Recommended environmental conditions during storage and transport:**

- Temperature: -40 °F (-40 °C) to 150 °F (66 °C)
- Relative humidity: Up to 95%
- **Note:** Product remains safe when stored or transported in temperatures from -40 °F (-40 °C) without relative humidity control to 158 °F (70 °C) at a relative humidity of up to 93%, non-condensing.
- When the equipment is to be stored for an extended period, remove the batteries.

**Recommended operating conditions:**

- Temperature: 49 °F (9 °C) to 110 °F (43 °C)
- **Note:** Product remains safe when operated at temperatures from 41 °F (5 °C) to 110 °F (43 °C) in relative humidity from 15% to 93%, non-condensing, and in atmospheric pressures from 700 hPa to 1060 hPa.

**Audible output level:** 65 dBA minimum at 3.77 in (96 mm)

**Classification with respect to electric shock:** Internally powered

**Protection from electric shock (IEC 60601-1):** Type BF

**Protection against ingress of liquids:** Ordinary equipment

**Mode of operation:** Non-continuous

## **Service life**

The expected service life of a typical Patient Assistant is 7 years.

## **Safety and compatibility standards**

The Patient Assistant complies with the following standards:

IEC 60601-1; IEC 60601-1-11, Type BF applied part (Patient Assistant),  
Medical electrical equipment safety

IEC 60601-1-2, Electromagnetic compatibility

EN45502-1, Safety, marking and information of medical devices

FCC Part 15





# 4

## Living life with your cardiac monitor

Most people resume their normal daily activities after having a cardiac monitor inserted. However, there may be certain situations that your doctor will ask you to avoid. This chapter provides the following important information:

- An overview and instructions regarding items that may temporarily interfere with the data collection abilities of your cardiac monitor.
- Precautions regarding certain types of medical procedures.

### **What you need to know about electromagnetic compatibility (EMC)**

Everything that uses electricity produces an **electromagnetic energy field**. This energy field surrounds the electrical item while it is connected to a source of electricity (even a battery source). The energy field is strongest near the item and weakens with distance from the item.

The relationship between these energy fields and your cardiac monitor is called **electromagnetic compatibility (EMC)**. Strong electromagnetic energy fields from electrical items may affect the data in your cardiac monitor and reduce the amount of data available to your doctor. It is important to review this chapter so you know what items to stay away from so you do not negatively impact the data collected in your cardiac monitor. Any effects of electromagnetic energy fields on your data will stop when you move away from the source of the electromagnetic energy field.

### **What household electrical items can affect the data stored in your cardiac monitor?**

Your cardiac monitor is not affected by most household electrical items, including electrical kitchen items, powered items used for cleaning and personal care, hobby items, power tools, and home electronics. However, using certain electrical items may affect the data about your heart that is stored in your cardiac monitor. By following the simple guidelines included in this chapter, you may avoid data problems related to electrical interference.

If you have questions about using electrical items and their possible effects on your cardiac monitor, contact your doctor.

## Wireless communication devices

Wireless communication devices include transmitters that can affect your cardiac monitor. When using wireless communication devices, keep them at least 6 in (15 cm) away from your cardiac monitor. The following items are examples of such devices:

- Handheld cellular, mobile, or cordless telephones (wireless telephones); two-way pagers; personal digital assistants (PDAs); smartphones; and mobile email devices
- Wireless-enabled devices such as laptop, notebook, or tablet computers; network routers; MP3 players; ereaders; gaming consoles; televisions; DVD players; and headsets
- Remote keyless entry and remote car starter devices

**Using wireless telephones** – Cardiac monitors have been tested with many types of wireless telephone technologies to ensure that they operate correctly while a wireless phone is in use. Keep a cardiac monitor at least 6 in (15 cm) away from the antenna of a handheld wireless telephone (for example, by holding the telephone to the ear

farthest away from the cardiac monitor). Do not carry the telephone in a pocket over the cardiac monitor or in a shoulder bag near the cardiac monitor.

## Household and hobby items with motors and other items that cause EMI

Household and hobby items that have motors or that generate electromagnetic energy fields could interfere with a cardiac monitor. Keep a cardiac monitor at least 6 in (15 cm) away from the following items:

- Handheld kitchen appliances, such as electric mixers
- Sewing machines and sergers
- Personal care items, such as corded handheld hair dryers, corded electric shavers, electric or ultrasonic toothbrushes (base charger), or back massagers
- Remote controller of radio-controlled toys
- Two-way walkie-talkies (less than 3 watts)

Here are some household and hobby items that require special precautions:

**Induction cook tops** – An induction cook top uses an alternating magnetic field to generate heat. Keep a cardiac monitor at least 24 in (60 cm) away from the heating zone when the induction cook top is turned on.

**Electronic body fat scale** – Using this type of scale can affect the data stored in the cardiac monitor.

**UPS (uninterruptable power source) up to 200 amperes** – Keep a cardiac monitor at least 12 in (30 cm) away from a UPS. If the UPS is operating by battery source, keep a cardiac monitor at least 18 in (45 cm) away.

**Electronic pet fences or invisible fences** – Keep a cardiac monitor at least 12 in (30 cm) away from the buried wire and the indoor antenna of electronic pet fences or invisible fences.

**Home-use electric kilns** – Keep a cardiac monitor at least 24 in (60 cm) away from home-use electric kilns.

**Handheld metal detectors** – Keep a cardiac monitor at least 24 in (60 cm) away from the detector end.

**Boat motors** – Keep a cardiac monitor at least 12 in (30 cm) away from electric trolling motors or gasoline-powered boat motors.

**Portable electric generators up to 20 kW** – Keep a cardiac monitor at least 12 in (30 cm) away from portable electric generators.

### Home power tools

Most home power tools should not affect cardiac monitors. Consider the following common-sense guidelines:

- Keep all equipment in good working order to avoid electrical shock.
- Be certain that plug-in tools are properly grounded (or double insulated). Using a ground fault interrupter outlet is a good safety measure (this inexpensive device prevents a sustained electrical shock).

Some home power tools could affect cardiac monitor operation. Consider the following guidelines to reduce the possibility of interference:

**Electric yard and handheld power tools (plug-in and cordless) –** Keep a cardiac monitor at least 6 in (15 cm) away from such tools.

**Soldering guns and demagnetizers –** Keep a cardiac monitor at least 12 in (30 cm) away from these tools.

**Gasoline-powered tools and gasoline-powered yard equipment –** Keep a cardiac monitor at least 12 in (30 cm) away from components of the ignition system. Turn off the motor before making adjustments.

**Car engine repair –** Turn off car engines before making any adjustments. When the engine is running, keep a cardiac monitor at least 12 in (30 cm) away from components of the ignition system.

## Industrial equipment

After recovering from the Reveal LINQ cardiac monitor insertion procedure, you likely will be able to return to work, to school, and to your daily routine. However, if you will be using or working near high-voltage equipment, sources of high electrical current, magnetic fields, or

other EMI sources that may affect cardiac monitor operation, consult with your doctor. You may need to avoid using, or working near, the following types of industrial equipment:

- Electric furnaces used in the manufacturing of steel
- Induction heating equipment and induction furnaces, such as kilns
- Industrial magnets or large magnets, such as those used in surface grinding and electromagnetic cranes
- Dielectric heaters used in industry to heat plastic and dry glue in furniture manufacturing
- Electric arc and resistance welding equipment
- Broadcasting antennas of AM, FM, shortwave radio, and TV stations
- Microwave transmitters. Note that microwave ovens are unlikely to affect cardiac monitors.
- Power plants, large generators, and transmission lines. Note that lower voltage distribution lines for homes and businesses are unlikely to affect cardiac monitors.



## Radio transmitters

Determining a safe distance between the antenna of a radio transmitter and a cardiac monitor depends on many factors such as transmitter power, frequency, and the antenna type. If the transmitter power is high or if the antenna cannot be directed away from a cardiac monitor, you may need to stay farther away from the antenna. Refer to the following guidelines for different types of radio transmitters:

**Two-way radio transmitter (less than 3 W)** – Keep a cardiac monitor at least 6 in (15 cm) away from the antenna.

**Portable transmitter (3 to 15 W)** – Keep a cardiac monitor at least 12 in (30 cm) away from the antenna.

**Commercial and government vehicle-mounted transmitters (15 to 30 W)** – Keep a cardiac monitor at least 24 in (60 cm) away from the antenna.

**Other transmitters (125 to 250 W)** – Keep a cardiac monitor at least 9 ft (2.75 m) away from the antenna. For transmission power levels higher than 250 W, contact Medtronic (see page 3) for more information.

## Security systems

When passing through security systems, follow these precautions:

**Electronic antitheft systems, such as in a store or a library, and point-of-entry control systems, such as gates or readers that include radio frequency identification equipment** – These systems should not affect a cardiac monitor, but, as a precaution, do not linger near or lean against such systems. Simply walk through these systems at a normal pace.

**Airport, courthouse, and jail security systems** – Given the short duration of security screening, it is unlikely that metal detectors (walk-through archways and handheld wands) and full body imaging scanners (also called millimeter wave scanners and three-dimensional imaging scanners) in airports, courthouses, and jails will affect a cardiac monitor. When encountering these security systems, follow these guidelines:

- Always carry your cardiac monitor ID card. If a cardiac monitor sets off a metal detector or security system, show your ID card to the security operator.

- Minimize the risk of temporary interference with your cardiac monitor while going through the security screening process by not touching metal surfaces around any screening equipment.
- Do not stop or linger in a walk-through archway; simply walk through the archway at a normal pace.
- If a handheld wand is used, ask the security operator not to hold it over or wave it back and forth over your cardiac monitor.
- If you have concerns about security screening methods, show your cardiac monitor ID card to the security operator, request alternative screening, and then follow the security operator's instructions.

## **Medical procedure warnings and precautions**

**Caution:** Before undergoing any medical procedure, tell the doctor or technician that you have an inserted cardiac monitor.

- Some medical procedures may require precautionary measures to prevent or minimize data interference.
- Some medical procedures may reduce the accuracy and completeness of the data stored in the cardiac monitor, which your doctor uses to monitor and diagnose your condition.

Most medical and dental procedures do not affect your cardiac monitor in any way. However, some medical procedures may temporarily affect the ability of your cardiac monitor to collect data, can cause electrical reset, or can damage the cardiac monitor. If you are scheduled to have a medical procedure, your heart doctor may retrieve collected data before the medical procedure and clear any recorded data after the medical procedure.

Your doctor or technician may need to speak with your heart doctor before performing the procedure. Your doctor may decide to contact Medtronic technical services for more information. After completing the procedure, your doctor will make sure that your cardiac monitor is operating correctly.

**Warning:** Diathermy treatments should not be used on Reveal LINQ cardiac monitor patients. Diathermy treatments may result in serious injury or damage to a Reveal LINQ cardiac monitor. Diathermy is a treatment that involves the therapeutic heating of body tissues. Diathermy treatments include high frequency, short wave, microwave, and therapeutic ultrasound. Doctors who have specific concerns about particular patient conditions and the use of diathermy can contact Medtronic for more information.

Medical procedures that may require your doctors to take some precautions include the following:

- Mammograms, CT scans, and high-intensity fluoroscopy
- Electrosurgery and RF or microwave ablation
- External defibrillation and cardioversion
- Hyperbaric therapy (including hyperbaric oxygen therapy, or HBOT)
- Lithotripsy
- Radiation therapy and radiotherapy
- Transcutaneous electrical nerve stimulators (TENS), including neuromuscular electrical stimulation. Because of the possible effects on cardiac monitor data collection, discuss the use of any TENS equipment with your heart doctor.
- Transurethral needle ablation (Medtronic TUNA therapy)
- MRI (magnetic resonance imaging) scans, which is a type of medical imaging that uses magnetic fields to create an internal view of the body. If your heart doctor decides you can have an MRI scan, you may feel your cardiac monitor being pulled as a result of the magnetic field when moving in and out of the magnetic resonance

(MR) scanner. You will not notice this while you are in the MR scanner.

**Caution:** Do not take the Patient Assistant into the MRI-controlled room (magnet room). Doing so can damage the Patient Assistant or the MR scanner.



**This is the MR Conditional symbol, which means your inserted cardiac monitor has been shown to pose no known hazards in a specified MR environment with specified conditions of use. Your heart doctor will have information about the environment and conditions.**

# Our mission is to help improve your life.

At Medtronic, we're proud of our reputation as the worldwide leader in medical technology.

In fact, we've been collaborating with physicians around the world to develop devices to treat heart disease for over 50 years.

We never stop working on ways to help our patients lead fuller, longer, healthier lives.

Hopefully we can help improve yours.

[www.medtronic.com](http://www.medtronic.com)

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