

Sensor User Guide



#### Introduction

The Guardian<sup>™</sup> 4 sensor is part of the Continuous Glucose Monitoring (CGM) system. The sensor converts small amounts of glucose from the interstitial fluid under the skin into an electronic signal. The system then uses these signals to provide sensor glucose (SG) values.



Sensor assembly

#### Indications for use

The Guardian 4 sensor (MMT-7040) is intended for use with the Guardian 4 transmitter (MMT-7841) to monitor glucose levels in persons with diabetes where self monitoring of blood glucose (SMBG) is indicated. The sensor is designed to replace fingerstick blood glucose (BG) readings for diabetes treatment decisions.

The sensor is intended for insertion into persons ages 7 years and older. The sensor is intended for insertion into the back of the upper arm or the upper buttocks in persons ages 7 through 17 years. The sensor is intended for insertion into the back of the upper arm or the abdomen in persons ages 18 years and older.

#### Contraindications

No contraindications are associated with Guardian 4 sensor use. For contraindications related to CGM, see the system user guide.

#### **Clinical benefits**

The Guardian 4 sensor is a component of the CGM system that provides SG values. See the system user guide for the clinical benefits of systems that use the Guardian 4 sensor.

#### **User safety**

#### Warnings

Read this entire user guide before attempting to insert the Guardian 4 sensor. The one-press serter (MMT-7512) is the only serter approved for use with the sensor. Failure to follow directions, or the use of a different insertion device, may result in improper insertion, pain, or injury.

Do not attempt to connect a transmitter or recorder that is not compatible with the sensor. The sensor is designed to work with approved transmitters only. Connecting the sensor to a transmitter or recorder that is not approved for use with the sensor may damage the components. Refer to the system user guide for a list of compatible products. The system can replace testing except in the below situations. These are the times when you need to do a BG test before deciding what to do or what treatment decision to make as a sensor reading may not accurately reflect BG levels:

## Always use your BG meter:

- during the first 12 hours of wearing the sensor
- · when you aren't sure if your SG value is correct
- when your symptoms don't match your SG value, do not ignore symptoms that may be due to low or high glucose
- when a SG value isn't available
- when you have taken medications that contain acetaminophen (such as Tylenol<sup>®</sup>), paracetamol, or hydroxyurea as they may cause your SG to become falsely raised

Do not use continuous glucose monitoring if hydroxyurea, also known as hydroxycarbamide, is taken. Hydroxyurea is used to treat certain diseases, such as cancer and sickle cell anemia. Hydroxyurea use results in higher SG readings compared to BG readings. Taking hydroxyurea while using continuous glucose monitoring can result in hypoglycemia caused by over-delivery of insulin and substantially higher SG readings in reports than actual BG readings.

Always check the label of any medication being taken to confirm if hydroxyurea or hydroxycarbamide is an active ingredient. If hydroxyurea is taken, consult a healthcare professional. Use additional BG meter readings to verify glucose levels.

Taking medications that contain acetaminophen or paracetamol, including, but not limited to fever reducers and cold medicine, while wearing the sensor, may falsely raise SG readings. The level of inaccuracy depends on the amount of acetaminophen or paracetamol active in the body and may be different for each person. Always check the label of any medications to confirm whether acetaminophen or paracetamol is an active ingredient. Use additional BG meter readings to confirm BG levels.

Do not expose the sensor to MRI equipment, diathermy devices, or other devices that generate strong magnetic fields. The performance of the sensor has not been evaluated under those conditions and may be unsafe. If the sensor is exposed to a strong magnetic field, discontinue use and contact a local Medtronic support representative for further assistance.

Always inspect the packaging for damage prior to use. Sensors are sterile and non-pyrogenic, unless the package has been opened or damaged. If the sensor packaging is open or damaged, discard the sensor directly into a sharps container. Use of a non-sterile sensor may result in infection at the insertion site.

Do not allow children to put small parts in their mouth. This product may pose a choking hazard that can result in serious injury or death.

If a person different from the patient helps with inserting the

sensor:

- Always wear gloves to insert the sensor. A retractable needle is attached to the sensor. Minimal bleeding may occur.
- Cover the sensor with sterile gauze to remove the needle housing from the sensor.

Place the needle housing directly into a sharps container after sensor insertion to prevent accidental needlestick injury.

Watch for bleeding at the insertion site (under, around, or on top of the sensor).

#### If bleeding occurs, do the following:

- 1. Apply steady pressure, using sterile gauze or a clean cloth placed on top of the sensor, for up to three minutes. The use of unsterile gauze may cause site infection.
- 2. If bleeding stops, connect the transmitter (or recorder) to the sensor.

If bleeding does not stop, do not connect the transmitter to the sensor because blood may get into the transmitter connector, and may damage the device.

#### If bleeding continues, causes excessive pain or discomfort, or is significantly visible in the plastic base of the sensor, do the following:

 Remove the sensor and continue to apply steady pressure until the bleeding stops. Discard the sensor in a sharps container.



Plastic base

- Check the site for redness, bleeding, irritation, pain, tenderness, or inflammation. Refer to a healthcare professional for indications on how to treat the condition.
- 3. Insert a new sensor in a different location.

For questions or concerns related to sensor use, contact a local Medtronic support representative for assistance.

For medical questions or concerns, contact a healthcare professional.

If a serious incident related to the device occurs, immediately report the incident to the manufacturer and local competent authority.

## Precautions

Wash hands with soap and water before inserting the Guardian 4 sensor to help prevent site infection.

Do not insert the sensor through tape. Inserting the sensor through tape may cause improper sensor insertion and function.

Only use alcohol to prepare the insertion site. Using alcohol to prepare the insertion site makes sure that residue is not left on the skin.

Rotate the sensor insertion site so that sites do not become overused.

Do not clean, resterilize, or try to extract the needle from the needle housing. An accidental needlestick or puncture may occur.

Do not reuse sensors. Reuse of a sensor may cause damage to the sensor surface and lead to inaccurate glucose values, site irritation, or infection.

Continuous glucose monotoring is not recommended for people who are unable or unwilling to maintain contact with their healthcare professional.

Successful CGM use requires sufficient vision or hearing to allow recognition of the alerts generated by the compatible system.

## **Risks and side effects**

Keep the Guardian 4 sensor out of reach of children. The sensor may pose a choking hazard that can result in serious injury or death.

Other risks related to sensor use include:

- · Skin irritation or other reactions
- Bruising
- Discomfort
- Redness
- Bleeding
- Pain
- Rash
- Infection
- Raised bump
- Appearance of a small "freckle-like" dot where needle was inserted
- Allergic reaction
- · Fainting secondary to anxiety or fear of needle insertion
- Soreness or tenderness
- · Swelling at insertion site
- Sensor fracture, breakage or damage
- · Minimal blood splatter associated with sensor needle removal
- Residual redness associated with adhesive or tapes or both
- Scarring

#### Hazardous substances

None.

#### Allergens

None known.

## Reagents

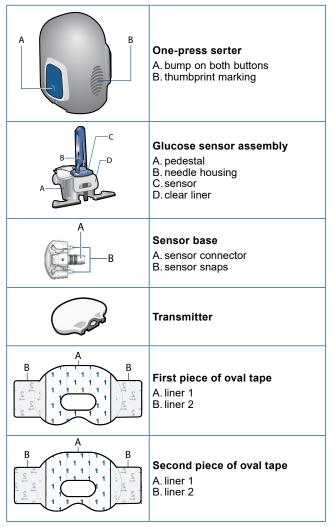
The Guardian 4 sensor contains two biological reagents: glucose oxidase, and human serum albumin (HSA). Glucose oxidase is derived from Aspergillus niger and manufactured to meet industry

requirements for the extraction and purification of enzymes for use in diagnostic, immunodiagnostic, and biotechnical applications. The HSA used on the sensor consists of purified and dried albumin fraction V derived from pasteurized human serum, which is crosslinked via glutaraldehyde. Approximately 3 µg of glucose oxidase and approximately 10 µg of HSA are used to manufacture each sensor. HSA is approved for IV infusion in humans at quantities much larger than in the sensor.

#### Remove the sensor

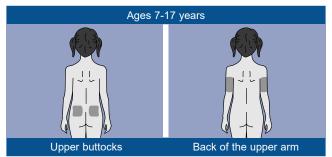
To change the Guardian 4 sensor, disconnect the transmitter from the sensor as described in the Guardian 4 transmitter user guide. Gently pull the sensor from the body to remove it. Discard the sensor in a sharps container.

#### Components



## Where to insert the sensor

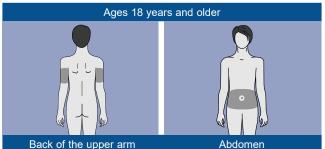
Choose an insertion site for the applicable age group. Target the shaded areas, and make sure that the insertion site has a sufficient amount of fat.





Insertion on abdomen for ages 7-17 years has not been evaluated for accuracy.

Note: Insertion onto the upper buttocks should target the top third of the buttocks area. Assistance from another person may be needed for sensor insertion into the back of the upper arm or the upper buttock. If assistance is not needed, a mirror may be helpful for self insertion.





Insertion on upper buttocks for ages 18 years and older has not been evaluated for accuracy.

# CAUTION: Avoid the 5.0 cm (2 inch) area around the navel to help make a comfortable insertion site and to help with sensor adhesion.

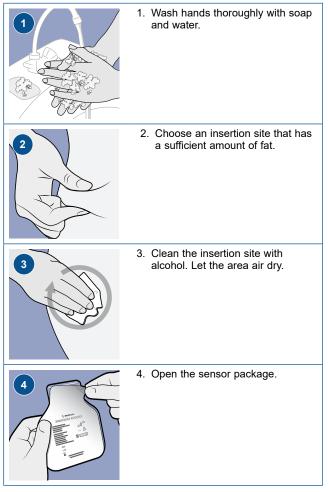
For best SG performance, and to prevent accidental sensor removal:

- Do not insert the sensor into muscle, tough skin, or scar tissue.
- · Avoid areas that are constrained by clothing or accessories.

- Avoid areas that are located under a belt or waistband.
- · Avoid areas subjected to vigorous movement during exercise.

#### Inserting the sensor

WARNING: Always wear gloves when inserting the sensor into another person to avoid contact with patient blood. Minimal bleeding may occur. Contact with patient blood may cause infection.





 Hold the pedestal and remove the glucose sensor assembly from the package. Place the pedestal on a clean, flat surface such as a table.

tucked tab





 Confirm that the adhesive tab of the sensor is tucked under the sensor connector and sensor snaps.

Correct

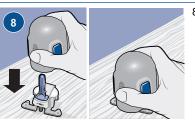
Incorrect



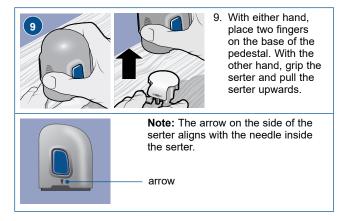


 Using either hand, place a thumb on the thumbprint marking to hold the serter. Fingers must not touch the serter buttons.

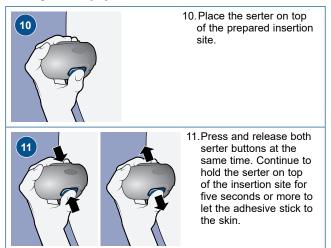
thumb on thumbprint marking



 Push the serter down onto the pedestal until the base of the serter sits flat on the table and there is a click.

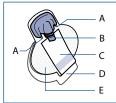


WARNING: Never point a loaded serter toward any body part where insertion is not desired. An accidental button-push may cause the needle to inject the sensor in an undesired location, causing minor injury.





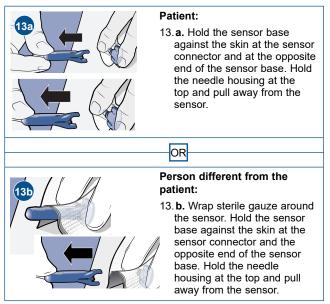
12. Lift the serter away from the insertion site. Fingers must not press the buttons while lifting the serter.



#### Sensor base

- A. sensor snaps
- B. sensor connector
- C. adhesive tab
- D. adhesive liner
- E. adhesive pad

If the sensor is inserted without assistance, complete step 13a. If a person different from the patient assisted with sensor insertion, complete step 13b.



WARNING: Always watch for bleeding at the insertion site. If bleeding occurs under, around, or on top of the sensor, apply steady pressure using sterile gauze or a clean cloth placed on top of the sensor for up to three minutes. The use of unsterile gauze may cause an infection. If bleeding does not stop, remove the sensor and apply steady pressure until the bleeding stops.



**Note:** After insertion, use of adhesive products, such as Skin Tac<sup>™</sup>, in addition to the oval tape is optional. If optional adhesive products are used, apply them to the skin under the adhesive pad prior to removing the liner. Adhesive products may also be applied to the adhesive pad or the skin around the sensor base. Allow the product to dry before continuing.





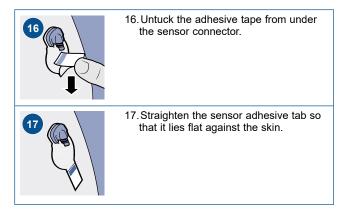
14. Remove the adhesive liner from under the adhesive pad. Pull the liner away from the sensor, staying close to the skin. Do not pull on the sensor when you remove the liner.

**Note:** Do not remove the adhesive liner from the rectangular adhesive tab. This tab will be used to secure the transmitter in a later step.

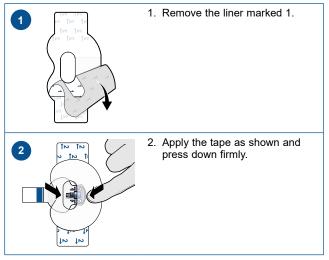
**Note:** If the sensor base moves, hold the sensor base down.

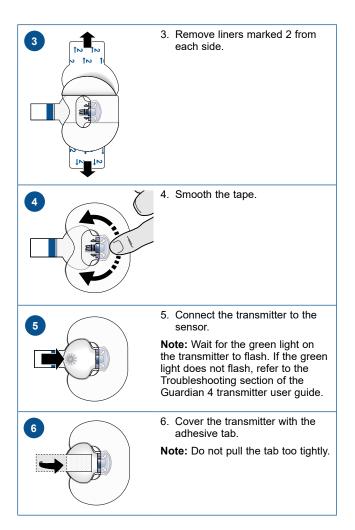


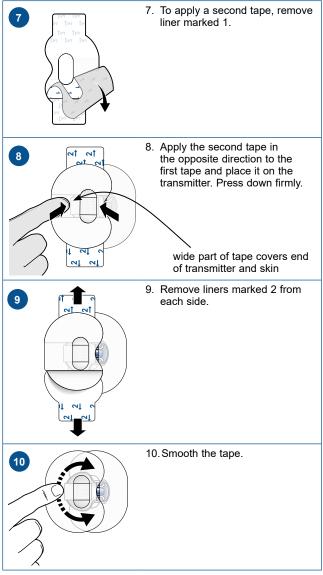
15. Firmly press the adhesive pad against the insertion site to confirm that the sensor base remains on the skin.



## Applying Oval Tape







**Note:** For details on how to enter sensor settings into a compatible display device, refer to the system user guide.

## Maintenance

#### Cleaning

The Guardian 4 sensor is a single-use, disposable device. No cleaning or maintenance is required.

#### Storage

#### CAUTION: Do not freeze the sensor, or store it in direct sunlight, extreme temperatures, or humidity. These conditions may damage the sensor.

Only store sensors at room temperature between 2 °C to 27 °C (36 °F to 80 °F).

Discard sensor after the "Use-by date" indicated on the label, if the package is damaged, or if the seal is broken.

#### Disposal

Dispose of the Guardian 4 sensor into a sharps container.

## **Technical specifications**

#### **Approximate dimensions**

3.8 x 6.7 x 5.2 centimeters (1.5 x 2.6 x 2.0 inches)

Approximate weight

2.80 grams (.09 ounces)

#### Sensor life of use

The Guardian 4 sensor can be used one time and has a maximum life of 170 hours (seven days). The 170-hour life span of the sensor begins when the sensor is connected to the transmitter.

Icon table	
	Use-by date
MD	Medical device
	Importer
2	Do not re-use
	Caution: consult instructions for use for important warnings or precautions not found on the label.
(1x)	One sensor per container/package
(5x)	Five sensors per container/package
(2x)	Two tapes per package
(10x)	Ten tapes per package
Ĩ	Consult instructions for use
REF	Catalogue number
LOT	Batch code

STERILER	Sterilized using irradiation
	Do not use if package is damaged
$\bigcirc$	Single sterile barrier system
XX°C XX°F	Storage temperature limit
	Open here
	Manufacturer
M	Date of manufacture
stere	Do not resterilize
I	Fragile, handle with care
Ť	Keep dry
•	Recyclable, contains recycled content
EC REP	Authorized representative in the European Community
<b>C €</b> 0459	Conformité Européenne (European Conformity). This symbol means that the device fully complies with applicable European Union Acts.
	Magnetic Resonance (MR) unsafe
X	Non-pyrogenic

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