Holter

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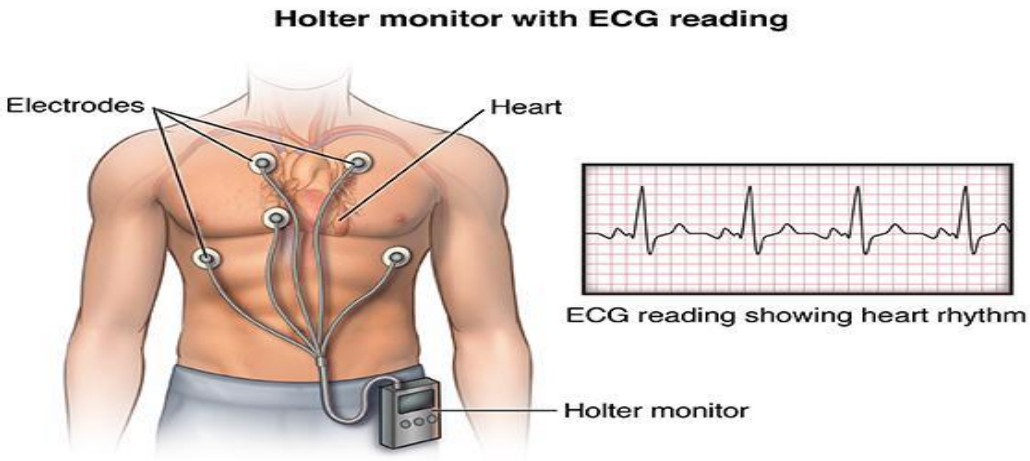
Definition of Holter:

➢ A Holter monitor is a type of portable electrocardiogram (ECG). It records the electrical activity of the heart over 24 hours or longer while you are away from your healthcare provider's office.

❖ A standard or resting ECG is one of the simplest and fastest tests used to check the heart. Small, plastic patches (electrodes) are put on certain points on the chest and belly (abdomen).

❖ The electrodes are connected to an ECG machine by wires. The electrical activity of the heart can be measured, recorded, and printed. No electricity is sent into the body.



Indications of Holter Monitoring:

Holter monitoring is indicated for the following reasons:

 Detect cardiac dysrhythmias that occur during normal activities and correlate them with symptoms experienced by the patient.

 Detect sporadic arrhythmias missed by an exercise or resting ECG.

 Evaluate chest pain, palpitations, dizziness, and syncope.

 Evaluate activity intolerance associated with an imbalance of oxygen supply and demand.

 Monitor the effectiveness of antiarrhythmic drug therapy or a pacemaker.

 Monitor for ischemia and dysrhythmias following myocardial infarction or heart surgery before changing rehabilitation and other therapeutic regimens.

Contraindications:

The Holter monitor is contraindicated when:

- It delays urgent treatment, hospitalization, or a procedure. For example, it should not be part of the initial investigation for angina, where a stress test would be more appropriate.
- The patient has syncope and high-risk factors, at which time inpatient management is mandatory.
- The patient has symptoms such as syncope, near-syncope, episodic dizziness, or palpitation in which other clear causes have been identified by history, physical examination, or laboratory tests.
- The ACC/AHA guidelines discouraged using ambulatory ECG for either arrhythmia detection or analysis of heart rhythm variability for risk assessment in patients without arrhythmia symptoms, even if they had cardiovascular conditions such as left ventricular hypertrophy or valvular heart disease.

- A patient who refuses to undergo further therapy once arrhythmia is established.
- Routine screening of asymptomatic patients.

☒ Holter Monitoring Procedure(Preparation):

The following steps will explain how Holter monitoring is done:

1. **Prepare the skin** The area where the electrode patches are placed are cleaned with alcohol; Excess hair may be shaved or clipped from the site if appropriate.
2. **Attach the electrodes.** Electrodes are applied to the chest wall securely attached to the lead wires and monitor. The monitor box may be worn around the waist or over the shoulder.
3. **Check the equipment.** A new or fully charged battery is inserted in the recorder, and the monitor box is checked for paper supply.
4. **Activate the device.** A tape is inserted, and the box is activated. This will record and store continuous cardiac rhythm data transmitted by the electrodes.
5. **Keep a diary.** The patient is advised to keep a diary of activities and of any cardiac symptoms such as chest pain, palpitations, dizziness, syncope, dyspnea, etc. that can occur while wearing the monitor for 24 to 72 hours.
6. **Remove the monitor from the body.** Once the data measurement period is completed, the pads are removed and the monitor device is returned to its box.
7. **Return the device.** The monitor is returned to the technician where the tape is interpreted by the computer and is submitted to the requesting health care provider.

➢ How a heart monitor works:

- Sensors on your chest will pick up your heart rhythms.
- The sensors will send your heart rhythms through wires (or wirelessly) to your cardiac monitor device.
- Your heart monitor will record your heart rhythms.
- You'll send (transmit) this information to your healthcare provider through a phone or computer.
- Your provider will review your data and look for any abnormal heart rhythms.
- If your provider sees an arrhythmia that's a concern, they may call you and ask you what symptoms you're having. They may also ask you to come in for a checkup so they can evaluate you.

❖ **Risks of a Holter monitoring:**

The Holter monitor is an easy way to check the heart's function. Risks of a Holter monitor are minimal and rare.

1-It can be hard to keep the electrodes stuck to your skin. Extra tape may be needed, It may be painful and uncomfortable when the sticky electrodes and tape are taken off.

2-If the electrodes are being on the skin for a long time, may cause skin irritation or blistering.

3-There may be other risks depending on your specific health condition. Talk to your healthcare provider about any concerns before wearing the monitor.

❖ **Factors may affect on results of the Holter monitor reading :-**

1- Being near magnets, metal detectors, high-voltage electrical wires, and electrical appliances. Appliances can include shavers, toothbrushes, and microwave ovens. Cell phones can also interfere with the signals. Keep them at least 6 inches away from the monitor box.

2- Excessive sweating, which may cause the leads to loosen or come off.

3- some devices may interrupt the signal from the electrodes to the Holter monitor Ex,

Electric blankets. - Magnets.

Electric razors and toothbrushes.

Metal detectors. - Microwave ovens.

☒ **Nursing Responsibilities of Holter Monitoring:-**

The following are the nursing interventions and nursing care considerations for a patient indicated for Holter monitoring:

➢ **Before the procedure:**

The following are the nursing interventions before wearing a Holter monitor:

 Advise the patient to wear loose-fitting clothing. This will allow the Holter monitor to stay in place and to avoid lead dislodgment.

 Provide precautionary measures. Advise patient to avoid contact with magnetic or electrical devices such as magnets, metal detectors, high-voltage areas, and electric blankets where it can interfere with the function of the monitor; Refrain from taking showers and tub bathing.

 Apply electropaste or conductive paste to the skin sites. This will provide conduction between the skin and electrodes.

 Explain the importance of maintaining a diary to record activities. The patient may perform his or her normal routine such

as walking, eating, sleeping, sexual activity, emotional upsets, exercise, and ingestion of medications and to log them in a diary.

 Explain how to check the recorder to make sure it's working properly. A light signal on the monitor will signify that an equipment malfunction or that an electrode has accidentally come off.

➢ **After the procedure:**

The nurse should note of the following nursing interventions after Holter monitoring:

 Remove all chest electrodes. After the patient has worn the monitor, gently remove the tape and other paraphernalia securing the electrodes.

 Schedule appointment with the health care provider (HCP). The ECG recording will be interpreted by a computer and a copy of a report is printed. This will be forwarded to the HCP who will discuss the results with the patient.

- **Normal Results:**

Normal findings after Holter monitoring will show:

 No significant arrhythmias or ST-segment changes in the electrocardiogram.

 Heart changes during various activities.

- **Abnormal Results:**

Abnormalities in a Holter monitoring will reveal:

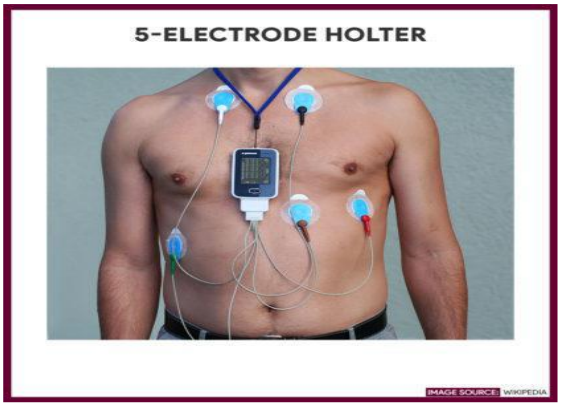
 Palpitations.

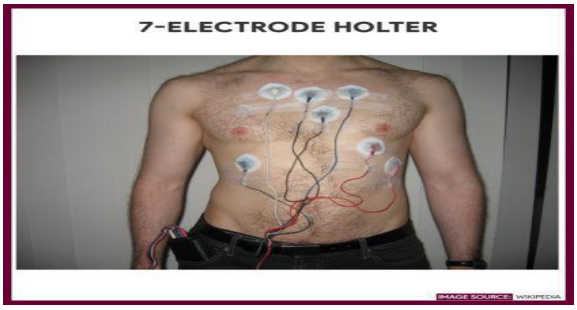
 Cardiomyopathy.

 Dysrhythmias such as premature ventricular contractions, bradycardias, tachycardias, and conduction effects.

 Hypoxic or ischemic changes.

 Mitral valve abnormality.





ELECTRODE PLACEMENT

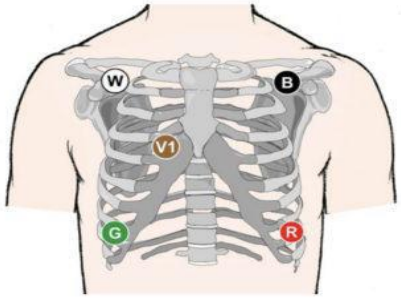


IMAGE SOURCE: BAHUMA.ORG

AFIB RECORDED IN HOLTER MONITOR

IMAGE SOURCE: JACC

SAMPLE HOLTER MONITOR DIARY

Sample Holter Monitor Diary		
Time	Activity	Symptom
7:00 am	*took medicine*	*none*
7:30 am	*ate breakfast*	*none*
8:00 am	*drove to work*	*heart beat faster*
9:00 am	*meeting with boss*	*heart beat faster*

IMAGE SOURCE: FAIRVIEW

HOLTER MONITOR

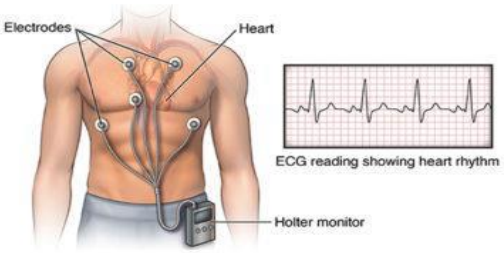


IMAGE SOURCE: JOHN HOPKINS MEDICINE