EKG TECH BASICS · ONE-PAGER

Holter, Event and Patch Monitors

Choosing the monitor by symptom frequency, hookup and skin prep, patient teaching, troubleshooting, scanning, burden, notification tiers and documentation

13 sources + more detail

ekgtechbasics.com/sheets/ekg-ambulatory-monitoring.html

checked Nov 2026

1 The monitors

MONITOR	HOW IT RECORDS	USUAL WEAR	FITS
Holter	Continuous, 2–3 or 12 channels; wired electrodes; diary and marker button	24–48 h	Daily symptoms, or symptoms the patient can bring on
Patch	Continuous, 1–2 leads from one adhesive patch; no wires; button	Up to 14 days	Symptoms every few days; AF or PVC burden
External loop recorder	Wired electrodes; rolling memory saves before and after a button press or an auto-trigger	Weeks, up to 30 days	Symptoms weekly to monthly
Post-event (symptom) recorder	Not worn; held to the chest when symptoms start; records only from then on	Weeks	Spells long enough to apply it, in a patient who stays alert
Mobile cardiac telemetry (MCT)	Continuous; sends events in near real time to a center where technicians review them	Up to 30 days	Infrequent symptoms needing prompt detection
Implantable loop recorder (ILR)	Under the skin of the chest; auto-triggers and patient activation	Up to about 3 years	Rare spells still unexplained after external monitoring

EXAM TIP Symptom frequency picks the monitor: the rarer the spells, the longer the recording. A patient who faints cannot press a button, so syncope needs a recorder that triggers itself. The ordering provider chooses; if the device or wear time does not fit the history, tell the provider before the hookup.

2 Hookup

1. Check the order (device, wear time, reason) and identify the patient as policy requires. Ask about tape or adhesive allergy.
2. Clear the last patient from the recorder (only after that download is confirmed), enter this patient's ID, set the clock to the correct time and check the battery and memory.
3. Prep each site: clip or shave hair if needed, clean with alcohol and let it dry, then rub off dead skin lightly.
4. Use fresh electrodes from a sealed, in-date pack. Place them over bone (sternum, ribs), not muscle, following the recorder's diagram.
5. Snap the wires, tape the wires down so they cannot tug the electrodes, and secure the recorder in its pouch or belt.
6. Watch every channel on the screen before the patient leaves; fix a flat or noisy channel now.

SAFETY A monitor is not for an emergency. If the patient has chest pain, nearly faints or looks unwell at the hookup, stay with the patient and get the nurse or provider at once.

3 Teach the patient

TOPIC	TEACH
Diary and button	Write the clock time, the activity and the symptom when it happens; press the button too. Note bedtime and waking.
Activity	Usual routine, including whatever brings the symptoms on; keep the monitor on overnight
Water	Holter: shower before the hookup and keep it dry. Patch: showering is allowed if the maker allows it.
Avoid	Electric blankets, magnets, metal detectors, high-voltage areas; the device's own list. Report any planned MRI.
Loose electrode	Press it down or replace it as shown
Device stops, skin reacts	Call the office that placed it
Event monitor or MCT	How to send a recording; the center may call about a rhythm
Return	Date, time and place to return the monitor and the diary

SAFETY Chest pain, sweating, sudden dizziness or fainting while wearing a monitor: call 911, do not drive in. Do not count on the monitor to get help.

4 Troubleshooting

FINDING	CHECK OR FIX
One channel flat, the others beating	That channel's electrode, snap, wire and cable; not a pause
All channels flat, sharp jumps at each end, patient 'felt fine'	Disconnection: report as signal loss with the times
Small QRS, software counts pauses	Undersensing: read another channel or move the electrode
Fast, irregular baseline during activity	Motion or muscle noise: look for sinus beats marching through in another channel
Electrodes lifting with sweat	Reprep and retape; teach how to press down or replace
Recorder turned off early	Bring it in; note the time it stopped; tell the provider
Transmission not arriving	Test a practice transmission at the hookup
File incomplete or will not open	Do not erase the recorder; recheck the download and patient ID

5 Scanning and reporting

- Confirm every software label against the strip. A true event shows in all channels at once; noise is usually worse in one (but a disconnection can flatten all of them).
- PVC burden = PVCs ÷ total beats × 100. AF burden = time in AF ÷ monitored time × 100, reported with the monitored time.
- Pauses: give the longest R-R in seconds, the clock time, sleep or awake, and whether P waves appear in the gap (see the Rhythm Gallery).
- List each diary entry with the rhythm at that minute, even sinus rhythm; list each arrhythmia with its time and any symptom.

One published example; follow your center's criteria.

TIER (ISHNE-HRS EXAMPLE)	FINDINGS
Emergency: call the patient; EMS if the physician cannot be reached	Sustained regular wide-complex tachycardia ≥160/min; prolonged asystole
Within 24 h	Mobitz II or complete AV block; syncope; observed pacemaker malfunction; ICD shock; sustained regular wide tachycardia <160. Patient-triggered (symptoms): sustained SVT ≥150, pause ≥4 s, sustained rate ≤30.
Office hours	New AF or flutter ≥30 s; AF or flutter rate ≥150 for ≥60 s; wide runs ≥120 from 3 beats to 30 s; Mobitz I; the patient-triggered rows above when the device triggered

6 Document and exam pearls

Hookup: identifiers checked, device and serial number, start time, ordered wear, electrode sites and skin, allergies, teaching. Return: time off, early-removal reason, skin, diary, download confirmed. Escalation: time found, rhythm, who was told and when.

EXAM TIP Daily palpitations: Holter. Weekly to monthly spells: 30-day loop (event) monitor or MCT. Fainting: auto-triggered monitor or ILR. Shower before a Holter. Flat line in one channel only: artifact. Patient-triggered pause ≥4 s: within 24 h. Mobitz II: within 24 h even without symptoms.

MORE How each monitor records

A Holter recorder is a small battery-powered box (about 200–300 g) worn in a pocket or pouch and wired to standard gel electrodes. It records every beat, usually in 2 or 3 channels and sometimes in 12, for 24–48 hours; some newer recorders run for up to 30 days. The patient takes part by keeping a diary and pressing the marker button, and the recording is analyzed afterward on a scanning workstation. Its strengths are multichannel signal quality and wide familiarity; its weak points are diaries and markers that patients do not keep, electrodes that come off, wire and skin artifact, and no real-time analysis.

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