

Fitness trackers and self-monitoring

- Managing your condition, symptoms and treatment, and its impact on you can be important for anyone with a medical or health condition.
- There are various health and fitness trackers, which are designed to help you to monitor your overall health and wellbeing and may also help you to manage your condition.

Many people use trackers and apps to monitor their overall health and wellbeing and to help them manage medical or health conditions. Cardiac monitors can be helpful when people are searching for correlations between symptoms, such as arrhythmia, and daily activities. Monitoring tools can help us to observe our health over time and gain more knowledge and control of our personal health. There are many products available, so it is worth thinking about what you want to get from them and finding out more about each one to make sure it meets your needs.

What types of monitoring are there?

In-hospital

In-patient cardiac and ECG monitors usually use a number of leads connected to the body of the patient in order to provide detailed observation of cardiac health to healthcare professionals. These kinds of monitors are often linked to an alarm system in the hospital that can alert medical professionals if there is a sudden change in cardiac health.

Outpatient

24-hour tape and Holter monitors are wearable devices, comprised of a number of leads with sticky pads that are connected across the body and a hand-held, battery-powered recording device that monitors the ECG over a prolonged period of time. These kinds of monitors can often pick up 'symptomless' arrhythmias, which may not have been noticed by the wearer but provide clues about the nature of symptoms. Because these devices can be bulky, people may adjust their daily activities and not experience symptoms during the period in which they are wearing them. These devices are helpful for gathering detailed information about cardiac health across different times of the day and various activities in order to search for patterns of symptoms. Data from these devices are sent for analysis, with any unusual patterns then passed on to your medical team.

ZIO Patch

The ZIO Patch is a new form of cardiac monitoring. The ZIO Patch differs from traditional Holter monitors as the monitoring device has no leads, no wires and no batteries. The ZIO Patch, which weighs just a few ounces, is a peel and stick device that is worn for an extended monitoring period of up to 14 days. Even

though the device is worn for a longer duration than a Holter monitor. Some people report that this is more comfortable to wear than a Holter monitor.

Implantable Loop Recorders

You can find our information resource on ILRs here:

 [www.cardiomyopathy.org
/information-resources](http://www.cardiomyopathy.org/information-resources)

If you experience loss of consciousness, but the cause is not clear, an ILR can be implanted under the skin in your chest under local anaesthetic for up to 3-years in order to provide continuous cardiac monitoring and data sharing via a wireless home device. ILR do not offer any interventions, only passive monitoring. These are small devices, similar in size to a pen lid, but implantation is a medical procedure.

Pulse-based

Smart watches with pulse monitoring functionality became available on the commercial market around 10-years ago. Many of the 'entry level' watches, such as the Apple Watch-SE and other 'sport watches' have a heart rate monitor. These are often recognisable because of the green light on the reverse of the watch, which is used to detect changes in the absorption of light in order to detect the pulse. These are good tools for monitoring the regularity of the pulse, but are not typically accurate enough to indicate medical anomalies. Some of these devices include an alert function for atrial fibrillation. Some wrist-based devices also claim to include blood pressure monitors. Compared to blood pressure monitors that use an inflatable cuff, at present, the majority of these products appear to have limited accuracy beyond broad trends.

Blood pressure monitors

Typically these use an inflatable cuff around the arm that increase the pressure on the artery wall until the vibration of the blood passing through can no longer be detected. These monitors provide the systolic and diastolic pressure, as well as the frequency of the pulse. These are often recommended for anyone on blood pressure medications, as they typically provide very accurate information. The guidelines for normal blood pressure ranges are between 90-120mm HG for systolic blood pressure and 60-80mm HG for diastolic blood pressure.

ECG-based

Smart devices with ECG are now available from a number of producers, amongst them are Apple Watch, FitBit, Withings, Samsung and KardiaMobile.

Many of these devices are able to provide reasonably accurate ECG data. A potential benefit of a wearable smart watch devices is that most people wear them all the time, so they can be quickly activated in order to capture even sporadic symptoms. Some of these products allow you to record ECG tracings with the potential ability for your clinical team to analyse the information recorded. Most of these devices record an ECG on demand, monitor your pulse intermittently and some monitor oxygen saturation, patterns of sleep and exercise.

Alivecor / Kardia mobile combines a small device with two electrodes where the fingers are placed, with a mobile app that collects the data from the electrodes. This uses a similar technique to in-hospital ECG monitors, by detecting small electrical differences across the heart. Both ECG smart watches and the Alivecor device are 'passive' devices, in that they do not 'give out' electrical signals, allowing them to be used safely by anyone with an existing cardiac device. Similarly, both types of devices give accurate ECG tracings, however, their interpretation of these tracings may not be accurate, as accuracy is influenced by a wide range of factors, such as certain medications and if the heart is being paced by an ICD for example.

Which is best for me?

With a wide range of products on the market, it can be tricky for individuals to choose which is best for them. Some of our cardiomyopathy community have shared with us that they feel that their smart device has helped them become more empowered in managing their cardiomyopathy. Other people have shared their experience of caution as their device included audible alerts to unusual heart rhythms, which may have increased their health anxiety, even when these were 'false alerts', so they decided to turn these device alerts off for a period of time.

Some factors worth considering are:

- What is your budget?
- What functionality do you want the device to include? These include: recording ECG tracings, tracking heart rate, monitoring sleep patterns, exercise, GPS etc.

- How easy are these to connect to your mobile? The FitBit, for example, is compatible with both iOS and Android, whereas the Apple Watch requires pairing with an iPhone for maximum functionality.
- How often are you willing to charge the device? Some devices have a battery life of weeks, whereas others may need charging every few days.

Key words

- **Palpitations:** An awareness of a change in the heart rate and or rhythm.
- **Atrial fibrillation:** A common type of arrhythmia or abnormal heart rhythm. AF is caused by disruption of the electrical messages that normally cause the heart muscle to contract, which means that it can't contract properly. Instead, the atria beat very quickly and are uncoordinated.
- **Tachycardia:** An abnormally fast heart rate, usually above 100 beats per minutes in an adult.
- **Arrhythmia:** A general term for abnormal heart rhythms. Examples of arrhythmias include atrial fibrillation, ventricular tachycardia and heart block.
- **ECG:** An electrocardiograph is a test that looks at the heart's rate and rhythm by recording its electrical activity. It involves having small electrodes attached to the skin, on the chest, arms and legs, which detect the electrical signals produced by the heart when it beats.
- **Oxygen saturation:** Oxygen saturation is the percentage of oxygen in a person's blood. It is measured by a device called a pulse oximeter that attaches to the fingertip. Normal oxygen saturation levels for healthy adults are between 95% and 100%.
- **Blood pressure:** A measure of heart function. This is measured in millimetres of mercury (mmHg) and is given as two numbers (such as 120/80mmHg). The top number is the pressure of blood when the heart beats (and pumps blood out of the heart). The bottom number is the pressure of blood when the heart is resting between beats.

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