

Your phone and watch could warn you of deadly heart problems. So why don't they?

October 9 2015, by David Glance



Fitbit and Apple.

The heart rate measurement feature in the Apple Watch was intended as

an aid to those using the device during exercise sessions. For a [teenage boy](#) it proved a lifesaver as a high heart rate reading prompted him to seek medical help which led to the discovery that he was suffering from a condition called [rhabdomyolysis](#) which can lead to kidney damage.

Since teenager Paul Houle's story, similar incidents have been reported of people seeking help on noticing abnormal heart rates being measured by their watch. Australian journalist [Gary Barker](#) acted immediately on seeing his Apple Watch report his heart rate behaving erratically and spiking between 50 and 150 beats a minute. The [irregular heart beat](#) was later diagnosed as being caused by [atrial fibrillation](#), a condition that can lead to heart failure and stroke.

A silent problem

The problem with atrial fibrillation is that it can go undetected in many people and although the incidence of atrial fibrillation is less than 1% in the general population over 50 will [have it](#), this increases to 10% in the over 75s. Once detected, the risk of stroke can be greatly reduced through drug treatment with blood anti-clotting agents.

Atrial fibrillation is caused by a breakdown in electrical signals that control the heart's contraction. The breakdown in the electrical stimulation causes the heart rate to change erratically and generally speed up. The confirmation of atrial fibrillation is normally done by a cardiologist performing an electrocardiogram (ECG), either in their office or using a device that the patient wears for a 24 hour period.

Shining light onto the problem

It turns out that mobile phones can also do a good job of detecting irregular rhythms in heart beats by using the flash and video camera.

This technique is called [photoplethysmography](#) and involves measuring the changes in absorption of different colours of light as the blood flows through a finger held over the phone's camera and illuminated by the flash.

Using this technique to measure heart beats allows software on the phone to [detect](#) with a high degree of accuracy the occurrence of atrial fibrillation.

Greater accuracy with smart watches and wearables

The Apple Watch, watches by Samsung and devices like the Fitbit, all use the same basic technique to measure heart rate by shining green light onto the skin of the wrist and measuring the reflection changes as blood flows through it. These devices have the advantage of being able to measure heart rate almost constantly. This would be ideal for early detection of atrial fibrillation because it sometimes occurs randomly and without the person noticing any symptoms. The lights and sensors on smart watches and wearables are potentially also able to be more accurate than using the camera and flash on a phone.

Why the hesitation?

If wearables are capable of detecting a condition such as atrial fibrillation, it would seem like an obvious thing for the various companies like Apple to provide what seems like an exceptionally useful, and potentially lifesaving, feature to their smart watch. So the question is, why didn't they?

Probably the most likely explanation for Apple, and others, pulling up short of enabling their devices to act in a diagnostic way was a possible fear of [regulation](#). Creating a device that could act in any way as a

medical device would have potentially required regulatory approval in the US and elsewhere. The other problem could have been a fear of potential legal cases where the watch misdiagnosed someone who later died of heart failure.

The risk of litigation may be overstated in that Apple could have always covered themselves with appropriate disclaimers. There are devices such as the portable [AliveCor ECG](#) that work with an iPhone and has been approved by the US Food and Drug Administration for the detection of atrial fibrillation. So it would have been possible for Apple to obtain regulatory approval if necessary.

What is more unfortunate however is the fact that in Apple's case, they decided not to allow other software developers to access the sensors directly so that they could provide these features even if Apple themselves were unwilling to do so.

It is possible to detect [atrial fibrillation](#) by manually feeling [your own pulse](#). However this requires people to be trained and aware of the risk in the first place. Eventually, all wearables with the capability to measure [heart rate](#) will include features to detect anomalies and with that, the possibility of early treatment and prevention of stroke in large numbers of people. Hopefully, manufacturers of these devices will move towards this goal sooner, rather than later.

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