Tech has taken over our lives. Where would we be without our phone which is also our entertainment system, camera, calendar, contacts, remote control, social center, and (sometimes)…phone? Everything we need is now in the palm of our hand. Even though fitness apps have been around pretty much since smartphones became a “thing,” medical and diagnostic apps are slowly advancing on the smartphone horizon. Right now you can do everything from receive yoga moves to do throughout your day, track your steps or your run, get meal plans and count calories/fat/carbs/etc, but what if you could analyze your heart’s rhythm, check your blood glucose levels, receive alerts when you are dehydrated, or monitor for signs of Parkinson’s or stroke?

Smartwatches have advantages over smartphones for these applications due to their being in contact with your skin all day since the skin is the largest organ in your body and the best litmus test for a variety of ailments. Your phone actually spends very little time in contact with your skin as it is usually in a pocket, purse or on the table next to you. But smartwatches have been struggling to make inroads over the past few years with limited success. Maybe it’s the size of the screen or the susceptibility to breakage of a really expensive gadget which has kept us from going back to wristwatches rather than our updated pocket watches. (Admit it, you probably don’t wear a wristwatch anymore, so your phone has become a pocket watch.) The newest health app offerings for smartwatches may start to change this dynamic.

Of course, FitBit was the first to really take off on the wearable fitness trend, tracking steps and heart rate. Some swear by it as their go-to fitness tracker, but many are saying the accuracy of the heart rate monitor, which uses photoplethysmography (PPG), is not all it’s cracked up to be because PPG is a system which uses light to monitor blood flow through the wrist. It has to be placed exactly, not too tight, not too loose, not over tattoos, to get a good reading. So if you are exercising and it slips or you put it on too tightly and it restricts blood flow, your readings may be off. That being said what about more complicated medical matters?

A company called [AliveCor](https://www.alivecor.com/?gclid=CODhr-_UuNQCFUpsfgodhi0B7A) has gotten FDA clearance on a product which uses a small device with two finger pads to take an ECG and transmit it to your screen and they are awaiting approval on a watch band which can do the same thing. And Apple Watch’s heart rate sensor, when paired with an artificial intelligence-based algorithm, can detect a serious and often symptomless heart arrhythmia, atrial fibrillation (AF or aFib) an astounding 97% of the time. While it’s not diagnostic since arrhythmia can often be caused by a number of factors, it is a tool which can be used to open dialogue with someone’s doctor and potentially save someone’s life[[1](http://www.aedsuperstore.com/blogs/wearable-heart-health-tech/?utm_campaign=June+2017+Newsletter+-+Final+%28Kn5nwj%29&utm_medium=email&_ke=ZGVlbnJAc291LmVkdQ%3D%3D&utm_source=Everyone" \l "wearable-heart-health-tech-n-1)].

One of the leading correlated conditions linked to heart disease is diabetes, and unfortunately, it is becoming a bigger and bigger epidemic in the US. Dexcom has developed an FDA-cleared system which uses a transmitter you self-insert just under the skin to monitor glucose levels continuously and alert you via your smartphone or smartwatch to highs and lows. This means fewer finger sticks for diabetics. There’s even a more traditional glucose meter which attaches to your phone directly from a company called Dario. Their app is also a total diabetes management plan helping you plan and track foods and exercise.

So what could the future hold for heart patients to help them take control of their own health management? Seeing your own ECG is only as good as the interpretation of the results. And the simple fitness trackers available now are only as valuable as the data they provide. When it comes to those at risk for sudden cardiac arrest, there are actually defibrillation vests which can administer a shock just like an AED in the event of loss of consciousness and heart rhythm, but they are only available by prescription and are exceptionally expensive; therefore not practical for everyday use by everyone – remember SCA can happen to anyone at any time regardless of age, ethnicity, gender, or apparent health status. Let’s look at some tech already developed but with an eye toward possibilities:

* On the market today you can find form-fitting shirts, tank tops, and bras with sensors placed in roughly the same configuration as ECG electrodes which monitor everything from breathing to sleep patterns, heart rate, workout statistics, and even full ECGs[[2](http://www.aedsuperstore.com/blogs/wearable-heart-health-tech/?utm_campaign=June+2017+Newsletter+-+Final+%28Kn5nwj%29&utm_medium=email&_ke=ZGVlbnJAc291LmVkdQ%3D%3D&utm_source=Everyone" \l "wearable-heart-health-tech-n-2)]. But what if these smart clothing items could detect abnormalities and send an alarm to your phone to warn you, or send an emergency response call to 911 for catastrophic events, or even administer a shock between two of the electrodes or sensors if one was determined to be needed? Not too far fetched when you consider the possible addition of a larger battery held within your phone’s case like the one used in this [Kickstarter device](https://www.indiegogo.com/projects/cellaed-the-world-s-first-phone-aed#/). Imagine if the runners who have gone into cardiac arrest and died during marathons had been wearing something like that?
* Back in 2014, there was talk of digital contact lenses which could not only correct far-sightedness but analyze tears for glucose levels in diabetics[[3](http://www.aedsuperstore.com/blogs/wearable-heart-health-tech/?utm_campaign=June+2017+Newsletter+-+Final+%28Kn5nwj%29&utm_medium=email&_ke=ZGVlbnJAc291LmVkdQ%3D%3D&utm_source=Everyone" \l "wearable-heart-health-tech-n-3)]. While this has stalled due to testing which revealed tears do not provide an adequate level of diagnostic material for glucose monitoring, there have to be other applications for which the analyzation of tears could be beneficial. Tears contain electrolytes (sodium, chlorine, potassium, urea), glucose, and proteins (antibodies, lysozyme, lipocalin, and lacritin)[[4](http://www.aedsuperstore.com/blogs/wearable-heart-health-tech/?utm_campaign=June+2017+Newsletter+-+Final+%28Kn5nwj%29&utm_medium=email&_ke=ZGVlbnJAc291LmVkdQ%3D%3D&utm_source=Everyone#wearable-heart-health-tech-n-4)], and electrolyte disorders can negatively affect blood pressure, muscles, and kidneys.[[5](http://www.aedsuperstore.com/blogs/wearable-heart-health-tech/?utm_campaign=June+2017+Newsletter+-+Final+%28Kn5nwj%29&utm_medium=email&_ke=ZGVlbnJAc291LmVkdQ%3D%3D&utm_source=Everyone#wearable-heart-health-tech-n-5)]
* Taking it a step further, what if all these new wearable technologies could instantly talk with your doctor or provide you with recommendations for the day based on what it finds? How far are we from a day when we don’t have to go into the doctor’s office for regular checkups at all?
1. **[1]**http://www.macworld.com/article/3196132/ios/research-shows-the-apple-watch-can-detect-an-early-sign-of-heart-disease.html
2. **[2]**https://www.wareable.com/smart-clothing/best-smart-clothing
3. **[3]**http://labiotech.eu/contact-lens-glucose-diabetes/
4. **[4]**https://sciencenotes.org/chemical-composition-teardrop/
5. **[5]**http://www.healthline.com/health/electrolyte-disorders#causes4