

Should Wearable Tech Be Tied to Patient Outcomes? Benefits and Risks of Sharing Personal Digital Data

written by Thomas Dent, M.D. | February 17, 2015



How many steps did you take today? If you're a Fitbit fan, you know precisely, and you're not alone. [Digital health devices were a \\$5 billion-plus growth industry last year](#), and the range of gadgets is expanding rapidly, from ear devices that measure blood pressure, respiration rate and oxygenation level, to

iPhone cases that record your ECG.

While wearable tech is a popular means to track your personal health and fitness, the data you collect is also a valuable commodity for ACOs, Health Systems and employers, who are looking for new ways to achieve meaningful savings under Value-Based Health Care. And they're willing to pay incentives. It's just a matter of time before providers and employers use these new data sources to engage patients in performance improvement.

The opportunity to collect real-time personal data to assess health status and to track and help patients improve outcomes has tremendous potential. Here's the catch: Your data, if you chose to share it, must be valid to be (a) useful and (b) an accurate basis for rewards rather than penalties. That's correct. As employers tie health performance to incentive plans, failure to meet benchmarks may also be linked to penalties. And to ensure the validity of your reported personal data, you may be required to share even more data with your employer or health plan than you originally intended or feel comfortable doing.

Voluntary Data Sharing Essential to Protecting Privacy

Here's an overview of the pros and cons of transmitting wearable tech digital data to providers and employers:

I currently use a Fitbit, and because I have an iPhone and am fond of such gadgets, I will get the Apple Watch when it becomes available this spring. That makes me a willing participant. Any collection of personal health data, I believe, must be based on voluntary participation, or we risk serious violations of privacy.

That said, defining patient outcomes (or more accurately, intermediate outcomes) based on wearables has some attractive benefits, along with some significant risks.

This data's primary advantage is that it is both continuous and objective. Continuous data are valuable for identifying change and trending, both for the individual and the group, enabling providers to develop performance measures based on change rather than a dichotomous pass/fail result. Continuous data are already used for tracking outcomes within the world of performance measurement, most notably BMI, Hemoglobin A1C and blood pressure.

A Powerful Source of Continuous, Objective Personal Health Data

How might the wearable tech data be used? One of the main data elements collected from a wearable is the number of steps taken in a day. The tabulating and trending of steps is a measure of physical activity. Based on this data supplied to the health care provider, patients may see a numeric account of their physical activity. Patients may then take recommended actions to increase their steps and meet daily goals. The actual clinical value here is to be determined, but these devices will assist in studying these effects, as well as what works to achieve sustainability of use. To be valuable, this information must be accurate; and, in fact, a recent study found that, for most devices, the step count recorded was accurate¹.

Wearables can help providers measure and track relevant clinical data that may otherwise be difficult to collect. Measuring steps taken within a short time (e.g. 15 minutes) provides a measure of exercise capacity. These results may serve to assess the impact of different interventions. A six-minute walk test is currently used as an outcome measure for patients with COPD, but it is costly; patients are encouraged to walk as fast as they can, which requires physician supervision and raises liability concerns. Whether this test might be supplanted by an assessment of steps using a patient's device data is not certain, but understanding a patient's "real world" maximal activity has potential value.

Data Validation Required for Fair and Accurate Reporting

It's important to note, however, that this data may be misleading, as is the case for a number of outcome measures. For example, a decrease in the number of steps for an individual patient may have numerous causes. There have been some days where my Fitbit was not working properly; the data suggested that I was inactive, when this was not the case. Likewise, an increase in steps could be the result of Fitbit hacking; there are even YouTube videos that show

you how. As with any data, there needs to be feedback on observed variances, and this communication is an important personal link between the physician and the patient.

For the same reasons, confirming the validity of this data is essential, particularly as financial rewards from employers are being tied to achieving goals. Different biometric markers might be used to prevent falsifying results. However, this means sharing greater amounts of data with an employer or health plan, which may well be off-putting for patients.

While the personal nature of these devices is obvious, wearable tech also presents a great opportunity to share data and create communities. Collaboration toward a shared or population-based outcome has significant potential. Of course, those who create the community (I believe this should be controlled by the patient) will determine security and influence willingness to share.

I doubt that patients are going to be comfortable sharing all of this data. Some of the Fitbit devices, and particularly the Apple Watch, will have GPS capabilities, so that a health provider could track wherever the patient goes. Once again, this raises significant issues around privacy and civil liberties, especially as more information is integrated.

The simplest approach is to restrict what data gets shared. Limiting parameters should narrow the focus to numeric results, such as outcome measures and assessing the efficacy of patient interventions (either surgical or medical). Obtaining structured clinician and patient feedback on the outliers (either high or low, or significant patterns) will enhance wearables' value for outcome measurement.

¹Case MA, Burwick HA, Volpp, KG, Patel MS. Accuracy of Smartphone Applications and Wearable Devices for Tracking Physical Activity. *JAMA*. 2015; 313(6): 625-626.

Founded in 2002, ICLOPS has pioneered data registry solutions for improving population health. Our industry experts provide comprehensive [Population Health with Grand Rounds](#) and [ICLOPS Outcomes Research](#) solutions that help you both report and improve your performance. ICLOPS is a CMS Qualified Clinical Data Registry.

[Contact ICLOPS for a Discovery Session.](#)

Image Credit: "Swing bridge over Waikoau River, Tuatapere Humpridge Track, Southland, New Zealand" by [Tomas Sobek](#), 2012.