targeting its design or marketing, Fitbit has demonstrated potential to be a simple, effective, and readily accessible clinical tool for O&P patients.

**FITBIT REPURPOSED: A CLINICAL TOOL FOR O&P** To use Fitbit as a clinical tool, we need to be aware of what it measures and how it does so.

**What does Fitbit measure?** This activity tracker measures the wearer’s everyday activity patterns in terms of step count, distance walked, floors/stairs climbed, calories burned, and active minutes. These parameters are calculated via proprietary algorithms that take into account two sources of information: acceleration data recorded by the device, and manually entered data specific to the user, such as height, weight, age, and step length. Step count is simply the number of steps taken in a given period of recording time. Distance walked and floors/stairs climbed show the distance traveled horizontally and vertically, respectively. Calories burned represents the total energy expended by the user during the recording time. Lastly, the user earns active minutes for every minute of activity that is considered of moderate to vigorous intensity. Intensity is classified as moderate or vigorous based on the standard metabolic equivalent (MET) of activity type compared to sitting quietly. For example, walking briskly is considered moderately intense and assigned three to six METs, meaning the energy cost is three to six times greater than the cost of sitting. Activities like running and boxing are considered vigorously intense, earning more than six METs. The user’s total number of active minutes per day reflects his or her overall activity intensity level.

**How does Fitbit work?** The easiest way to understand the accelerometer inside the device is to look at how it detects a step. There exists a threshold for the acceleration signal, and each time the threshold is met or exceeded, the accelerometer counts one step. If the threshold is not met, the accelerometer does not register a step. A common source of error arises from a step that does not produce an acceleration signal that reaches the threshold, for example, a step that is taken very slowly may not produce a signal. On the other hand, an acceleration signal can reach or cross the threshold when a step was not actually taken. For instance, stepping or moving around in place or fidgeting in a chair could produce a signal that meets or exceeds the threshold. These sources of error result in undercounting or overcounting steps.

To be considered a clinical tool—and not just a handy device for recreational use—Fitbit must be accurate and robust. It should stand up to existing gold standard methods, which include observation by video recording and research-grade accelerometer systems designed for clinical use.

**Is Fitbit accurate?** Multiple recent studies attest to Fitbit’s accuracy in counting steps for people with abnormal gait patterns and known deviations: individuals following a stroke or who have traumatic brain injuries (TBIs), and the elderly. Table 1 shows that step count accuracy ranged from 94 to 97.5 percent in healthy adults, healthy elderly individuals, and people who have suffered a stroke.2-4 Moreover, step count had excellent correlation (ICC = 0.88-0.99 and r = 0.99) with gold standard methods in healthy adults, elderly community ambulators, and people with TBIs.5-7

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