



# FITNESS TRACKERS

Fitness trackers continue to grow in popularity and simultaneously expand their capabilities in providing the user with a wider range of information and features about their health and fitness. Fitness can mean a lot of different things to a lot of different people. Fitness can be described as the condition of being physically fit and healthy at a level of being suitable to fulfill a particular role or task. The Center for Disease Control defines physical fitness as the ability to carry out daily tasks with vigor and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and respond to emergencies. It includes everything from getting out of bed to hiking to performing CPR. Trackers have been designed and developed to monitor some vital data of human activity, convey that data in a meaningful and useful way, and provide the user with valuable feedback to evaluate their progress toward reaching their own fitness goals.

Everyone’s physical condition and fitness goals are as unique as their fingerprints. The challenge for developers of these valuable biometric devices is to provide products that address the needs of these uniquely different consumers. Before purchasing a fitness tracker, consider asking the following questions:

- What are your physical fitness goals?
- Are you trying to boost a lapsed fitness routine?
- Are you training for a marathon or road race?
- Are you trying to adjust activities related to improving a clinical condition?
- Are you trying to monitor vitals for evaluation and benchmarking?

The term “tracker” implies that it is monitoring or following your physical activity. While some believe that a tracker might improve your physical fitness, the reality is that it does not affect anyone’s physical activity directly but only indirectly by the information it provides the user. However, that information can be extremely useful and helpful to the user by monitoring progress to their own specific goals. They can also provide motivational support in the form of challenges, interaction with online friends, and alerts when “it is time to get up.” However, like a gym membership, it only provides that information if you use it.



Figure 6: Fitness Trackers (Source - Geek.com)

A Fitness Tracker is generally a wrist-worn device that can detect some combination of walking steps, heart rate, sleep patterns, and even swimming laps. Most interact with computers to download the wearer’s activity using Bluetooth® technology.

While many smartwatches on the market do monitor a few physical activities via some type of health/fitness app, dedicated fitness trackers tend to monitor more functions more accurately.

Sensors integrated into all fitness trackers monitor your activities and movements and transmitting that data wirelessly to an app or computer. The value in this process is that it stores data over time allowing the wearer to



keep historical records that may provide insight towards progress, identify trends, and track progress longitudinally. Of course, each tracker's ability to monitor activities varies. Trackers can measure steps, sleep patterns, heart rate, skin temperature, and some even measure the amount of moisture on the skin (perspiration).

Key features that help these wrist-worn devices function:

- Accelerometer – tracks up-down, side-to-side and front-to-back movements helpful in measuring steps and other physical movement
- Heart rate sensor – monitors the user's pulse rate during any physical activity through the day, including while at-rest
- Gyroscope – a sensor that detects if the user is standing, sitting, reclining, swimming, biking, etc.
- GPS – used to track physical location and movement
- Magnetometer – measures magnetism detecting direction of movement
- Barometer – measures air pressure to detect slight changes in altitude, like flights of steps

Not every fitness tracker includes all these sensors and forms of collecting and transmitting data about the wearer. Finding the right fitness tracker is a very thoughtful process that requires the consumer to consider their own goals, needs, and the tracker that can connect them all. Some trackers can sync with other devices that provide more accurate measures like a bathroom scale. Like smartwatches, they can even provide notifications of incoming calls, emails, or text messages.

Keep in mind that there are more and more devices being developed to identify, monitor, and detect medical conditions. These are not fitness trackers by design and are considered a different class of monitors. These are wearable medical devices such as the KardiaBand® that is worn by patients with irregular heartbeat. These are medical tools not fitness trackers.

Consumer Reports identifies two types of fitness trackers, the All-Day and the Training models. A third model has surfaced lately adding a new dimension to this growing market, the Ring tracker. All of these are similar in function while the latter two are wrist-worn, the new finger-worn models are included in this category of products.



Figure 7: All-Day Fitness Tracker



Figure 8: Training Fitness Tracker



Figure 9: Ring Fitness Tracker



### All-Day Fitness Trackers

These models are designed to be comfortable, fashionable and discreet with the many functional features of most fitness trackers. These trackers can include any or all the following functional benefits to the wearer.

- Steps taken
- Stairs climbed
- Duration of activity/exercise
- Active minutes (resting vs. moving)
- Sleep time (may include REM sleep)

### Training Fitness Trackers

These models tend to be more rugged in design. They are also designed to fit different types of intense physical activity which may include the need for them to be water resistant, waterproof or fully submersible. They may include any or all the following for the wearer.

- Generally, all functions of All-Day trackers, plus
- Heart rate monitoring
- Breathing patterns
- Miles traveled (walking, jogging, or running)
- Speed, pace, and route
- Swimming laps in the pool
- Altitude changes (cyclists, skiers, and hikers)
- Music controls

### Ring Fitness Trackers (Smartring)

These models are relatively new to the market and is a different wearable than the wrist-worn models but still included in this category of products. They are considered by some critics to be more like jewelry with technology built in them, rather than technology built around its wearable design. By nature of its size, this device is paired with a smartphone app and does not include any visible display like most other fitness trackers. By nature of their size, they can use Bluetooth® or NFC technology. There are very few products on the market but the functional benefits among them consistently include:

- Sleep tracker
- Activity
- Heart rate

### Selecting your Fitness Tracker

With the three types of fitness trackers identified above, and their relative monitoring features highlighted, they remain some important considerations when looking to purchase a fitness tracker. Taking functional characteristics into consideration, the consumer should evaluate the following features.

- **Style** – Trackers come in all shapes and sizes. The best approach is to try them on before you purchase one that fits well and matches your form and function as well as personal style. They are available in a wide range of colors and materials with most include silicone, rubber, or nylon bands. In addition, some come with interchangeable bands or other accessories to add to their stylish appeal. The closures also may be an important thing to consider. The key with style is to find one that you feel comfortable wearing every day. Like any good stylist, accessories make these devices a bit more attractive for the style-conscious wearer to include bands, skins, guards, etc.
- **Display** – Some trackers have no onboard display at all, including the ring fitness tracker. The only way to view the data monitored and collected is through a smartphone or computer app. Others will include all relevant measured functions on a digital display to include progress charts/graphs and real-time information. This can be important in a workout setting when you are trying to reach a target heart rate or other form of real-time feedback. Others, however, may fall somewhere in between showing only symbols, words/numbers, or even provide audible feedback



and notifications. The app associated with each device should also be considered as part of the “display” features. That is an interactive component between the user and the data on the device. If you plan to spend considerable time outside, consider the readability of the display in bright lights for daytime activity and conversely low-light activity.

- **Compatibility** – As most devices link to a smartphone or computer app, determining which one interfaces with your existing devices is critical. Some trackers only sync with Apple iOS® devices, while others interface with Android®. One important thing to remember is that most do not work with Windows®.
- **Accuracy** – There is a wide range of sensors and technology in these trackers. Not all are created equal. As a result, there is some degree of imprecision that is inherently part of these devices. This is more so true of multifunction devices. Devices that focus on a single measure are more likely to be accurate than multifunction models. For example, if you are primarily interested in heart rate during your workouts, you may want to look for the devices that have a sensor strapped to the chest that transmits to the wrist-worn tracker.
- **Battery Life** – The tracker’s ability to monitor your fitness activity is limited by its battery life. Trackers can have battery life lasting as short as 1 day to several months depending on the type of battery, type of device, and its functional features. Some devices use the disk-type “watch” batteries which are disposable. Battery life can also be affected by the functional features on the device. Touchscreen displays with sound, vibration, multiple sensors, etc. can use considerably more battery life as well. However, the complexity of battery type, size of the tracker, and functions makes it difficult to evaluate. Read product labeling to “battery life” details. Most will disclose the length (in days) that the tracker can be worn on a full charge. Compare that with your own personal preferences to determine if removing the device daily is better suited to your routine or a device that runs for longer periods of time is more favorable. This becomes a very personal decision. Don’t overlook reviewing its charging technology. Knowing how the device is charged may influence your choice (e.g. docking station, USB charger, A/C adapter)
- **Water** – Water and electronics rarely play well together when it is spontaneous. Plan ahead and look at the tracker’s design as it relates to water. Your workout may not include a few laps in the pool, but a physically challenging workout may produce a river of sweat that might affect your tracker. Some trackers are in fact waterproof to allow for the swimmer to keep it on. Others may only be “water-resistant” and can survive handwashing and the occasional splash.

#### Sources:

Center for Disease Control and Prevention [www.cdc.gov](http://www.cdc.gov)

Consumer Reports [www.consumerreports.com](http://www.consumerreports.com)

Geek.com [www.geek.com](http://www.geek.com)

PC Magazine [www.pcmag.com](http://www.pcmag.com)

#### Suggested Supplemental Resources

Consumer Reports <https://www.consumerreports.org/cro/fitness-trackers/buying-guide/index.htm>

Best Buy Blog <https://blog.bestbuy.ca/buying-guides/activity-and-health-tracker-buying-guide>