

A new device helps monitor low-level physical activity with a cell phone

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About two thirds of the American population is overweight or obese, putting them at higher risk for health problems such as heart disease, stroke, cancer and diabetes. The obesity epidemic in America is the result of poor eating habits, genetics, and a lack of exercise. It's therefore difficult for public health officials to get people to make a conscious effort to control their weight.

The Cell Phone Device That Helps You Exercise

This is why Chinmay Manohar in the Department Endocrinology, Nutrition and Diabetes of the Mayo Clinic is designing a device to help motivate people to be more active. His team has developed a program that helps people monitor their normal day-to-day physical activity using an everyday device like a [cell phone](#) or mp3 player.

Mr. Manohar will be presenting his team's work at the 2010 Experimental Biology meeting in Anaheim, CA on April 24-28. His presentation, entitled "Laboratory evaluation of the accuracy of a triaxial accelerometer embedded into a cell phone platform for measuring physical activity," is based on research performed with Shelly McCrady and James Levine of the Mayo Clinic, Rochester, MN; and Yuichi Fujiki and Ioannis Pavlidis from the Department of Computer Science at the University of Houston, Houston, TX.

Designing the Right Device

The idea took hold when a study published by Manohar's department showed that under a controlled diet, leaner people tend to spend two and a half more hours per day standing than did heavier people. The results indicated that leaner people were more active in their day-to-day activities even when they weren't exercising. According to Manohar, "If that is the case, why don't we encourage people to get out of their chairs?"

Manohar's group set out to design a device to promote more physical activity. The ideal device would be something that is affordable and commercially available. The team settled on the [iPhone](#)® and the iPod Touch® because many people already own these devices and they come with built in motion sensors. The research group created a program called the Walk n'Play that can be downloaded for free through iTunes® to distribute the technology to a wider population. More and more Smart phones are using motion sensors and making the program compatible between platforms will not be difficult.

Walk n'Play: Designed for Everybody

The current version is fairly basic, according to Manohar. The user inputs their height and weight into the program and throughout the day, their score can be monitored. The program will tell the user if they are winning or losing against the computer. There is no pressure and the game does not ask you to do any specific exercise. But turning physical activity into a game makes people more competitive and more likely to get active.

Manohar says that most off-the-shelf devices tend to be unreliable for measuring the lower speeds detected by the Walk n'Play. This is because most of the devices on the market are used for measuring exercise like jogging or running, not for the day-to-day movement for which the Walk

n'Play is designed. The program was tested for the ability to detect changes in movement as little as half a mile per hour. They tested positions from 31 volunteers like sitting, standing and lying down and tested seven speeds on the treadmill to determine how precise the program was. Using the results of these movement tests, Manohar's group developed a gold standard for typical movements used in daily activities.

The iPhone® and the iPod Touch use motion sensors called accelerometers that detect motion. The program is designed to access the [accelerometer](#) in the phone and convert the motion that is detected into activity units as a way to measure the [physical activity](#).

A Motivational Push

Over 10,000 people have already downloaded the Walk n'Play, but Manohar knows it will take more than a basic activity monitor to keep people's interest.

"You have to put an element of fun into the whole thing to encourage people to be more active," Manohar said, "we put people into a gaming mind-set and people unknowingly do exercise and have fun doing it."

The group further modified the program to integrate basic social networking. Fitness and weight-loss in general is easier to do with a buddy. The newer features will allow a person to play against their friends or even compete with people or top performers from other countries or time zones. Users can even post their performance as their Twitter status.

According to Manohar, most people know they need more exercise to maintain a healthy weight, but getting up the motivation for a workout plan can be daunting. Using programs like the Walk n'Play can

encourage people to make incremental changes in their daily activities that can add up to better health, like promoting people to take the stairs more often to get in that extra little bit of exercise for the day.

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