

Are activity monitors fit for exercise research? Getting there, but further steps needed

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Activity monitors or fitness trackers are fun and informative gadgets to help track daily physical activity. But as a source of objective data for research on the health benefits of exercise, they're not yet fully up to speed, reports a paper in *Progress in Preventive Medicine*, the official journal of the European Society of Preventive Medicine.

"Advances in the development of objective monitoring devices such as accelerometers have spurred hopes of defining more accurately the relationships between habitual [physical activity](#) and chronic disease," writes Roy J. Shephard, MD, PhD, of University of Toronto. In a "state of the science" review, he identifies some key issues that need to be worked out in using data from activity monitors to confirm and clarify recommendations for physical activity to promote good health.

Fitness Trackers Promise Objective Data for Prevention Research

Dr. Shephard reviewed and analyzed the results of 12 studies evaluating accelerometers, step counters, and similar devices for objective measurement of physical activity. This emerging body of evidence—all of the studies were performed within the past decade—shows the promise and current limitations of activity monitors for health and prevention research.

Until recently, studies of physical activity and health—especially for preventing common chronic diseases—have relied on various types of questionnaires. Even simple questionnaires have "moderate validity" compared to other measures of daily energy expenditure and physical activity. These studies have led to recommended levels of physical activity to maintain good health: usually about 150 minutes of moderate activity per week.

Current [fitness trackers](#) record activity in terms of the number of steps per day. The recommendation for 150 minutes of physical activity per week is generally consistent with activity monitor studies suggesting step counts of 7,000 to 8,000 per day.

As activity monitors become more sophisticated and less expensive, there's growing interest in using them as a source of data on daily physical activity. But for several reasons, researchers can't just plug in objective data from fitness trackers to confirm studies using subjective questionnaire data. Simply counting steps leaves out some important information—in particular, it doesn't account for intensity of effort.

Current accelerometers perform fairly well at moderate walking speeds, but are less accurate under other conditions—for example, slow walking, vigorous running, and atypical gait patterns. They also miss some important sources of [energy expenditure](#), such as cycling, swimming, and weight-lifting, Dr. Shephard notes.

Having reliable objective data on physical activity could help to address several unanswered questions, including the best exercise "dose" for maximum health benefit. Other key issues include confirming the cause-and-effect relationship between physical activity and chronic disease risk, as well as the adverse [health](#) effects of sedentary habits.

Continued technical advances might help to overcome some of the

limitations of current activity monitors. In the near future, more complex devices may be capable of linking simple body acceleration data to other factors such as posture and GPS location. Researchers are also working on automated data collection and analysis techniques to replace labor-intensive manual processes. Dr. Shephard concludes, "Future technical developments [will] allow larger scale longitudinal objective studies, with a greater realization of the potential inherent in objective monitoring."

Provided by Wolters Kluwer Health

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