TO THE EDITOR:

We read with a great interest the study of Barzilay et al.1 that examined in two patients undergoing spine surgery whether surgical outcomes could be assessed objectively using a GPS. GPS data were recorded from unconstrained free-living measurements during a 6-week period. From these measurements, the authors computed several walking parameters as walking distances or speeds, and an index named “claudication index”: the maximum distance walked before the patient needed to stop and rest. However, many external events can interfere within the patient’s walk in his/her own environment (waiting at a traffic light, meeting a friend…) and we wonder how it can be ascertained that this “maximum distance” was truly symptom-limited. In addition, with a GPS recording at a sampling rate of 0.1 Hz (one recording every 10 seconds), it cannot be excluded, and quite likely, that short resting bouts (<20 seconds) will be missed and incorporated into walking bouts, thus artificially increasing the “claudication index.” Although the GPS is a very promising tool to assess walking capacity, our experience shows that validation studies, as well as feasibility studies with large sample of subjects, are required before the GPS technique can be used as a routine.2,3

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IN RESPONSE:

We would like to thank Alexis Le Faucheur, Pierre Abraham, and Bénédicte Noury-Desvaux for their comments. We read with interest their work documenting walking parameters in vascular claudication, using GPS technology.1 The points raised in their letter to the editor are well taken.

To make GPS a routine tool in the field of outcome, population studies will be needed to establish norms of outdoor spatial behavior in different age groups, genders, and societies. Other population studies would allow us to understand spatial behavior in pathologies affecting mobility (Neurological, musculoskeletal, vascular, cardiovascular, pulmonary, etc.). Last but not least, GPS-based outcome studies will allow us to record the effects of various treatments on walking capacity.

References


The device(s)/drug(s) that is/are the subject of this manuscript is/are not FDA-approved for this indication.

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mobility, thus shedding more light in areas of controversy, such as surgery in low back pain.

Recording one persons’ activity for 6 weeks, at a sampling rate of 0.1 Hz (1 sampling per 10 seconds), leads to a huge amount of points of data (about half a million). Theoretically, very short periods of rest will be missed; although after watching our patients’ data, we assume rest periods are usually longer than 10 seconds. However, to prove this point; GPS data is being acquired every 1 to 5 seconds in one of the present studies.

Stops related to traffic lights are easily recognized, when combining the GPS data with a map of the recorded area. When patients are followed for long periods, as performed in the pilot reported in “Spine,”2 the amount of data is enough to establish walking speeds, distances, and a reliable “claudication index.” Moreover, trends of improvement or lack of it are easily recognized. We assume that tracking a patient for shorter periods preoperatively, and then periodically postoperatively will prove to be accurate enough in the study of surgical outcome in the future.

Yair Barzilay, MD
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References