

Utilization of wearable technology to track functional changes in a patient with myopathy

To the Editor,

Neuromuscular disorders are disorders which affect the peripheral nervous system. These disorders include conditions such as muscular dystrophies, neuropathies, and disorders of the neuromuscular junction, among others. Patients are typically evaluated in an outpatient clinic; follow-up appointments can be months away. This prolonged duration between appointments can make it difficult to detect nuanced changes in symptoms as well as increase difficulty in assessing the short-term effects of therapeutic trials.

More recently, wearable technologies have become more mainstream. Devices such as the Apple Watch (Cupertino, California, USA) or Samsung Galaxy Watch (Suwon, South Korea) are becoming more pervasive in society. Depending on the wearable device, they can track a variety of different measurements including daily steps, caloric burn, heart rate, sleep cycles, and respiratory rate. Wearable technology has been implemented in a variety of different neurologic conditions including Parkinson's disease,^[1] multiple sclerosis,^[2,3] stroke,^[4,5] transient ischemic attacks,^[4,5] seizures,^[6] facioscapulohumeral dystrophy,^[7] and chronic inflammatory demyelinating polyneuropathy.^[8]

We report a patient seen in our neuromuscular clinic with an irritable myopathy. Examination was consistent with proximal greater than distal predominantly symmetric weakness in the lower extremities with absent Achilles tendon reflexes. No evidence of muscle atrophy or fasciculations were noted in the cervical lumbar or bulbar segments. Repeated electromyographies were completed which showed evidence of irritable chronic myopathy. As part of the workup process, skeletal muscle biopsy was done which showed evidence of patchy mild endomysial chronic inflammation with myopathic variation in fiber size.

The patient participated in physical therapy and exercised to retain strength and stability. He would track his progress using his Apple Watch which would show changes in his functional status which would correlate with his subjective clinical status and clinical examinations. These metrics included step count, walking steadiness, and walking asymmetry. These data helped guide conversations about gait safety and the use of assistive devices for the patient.

As the prevalence of wearable devices increases, more granular data will be available to clinicians. The use of these data could be potentially helpful in clinical trial results tracking as well as monitoring patients for disease progression. These devices hold significant potential in patients with neuromuscular disorders and further studies are necessary in validation of their findings in clinical care. We encourage discussion with patients about the data available on their wrists to gain a better understanding of clinical applicability. These data can also hold insights into stroke care and recovery, helping monitor patients poststroke as well.

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Conflicts of interest

There are no conflicts of interest.

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References

- Adams JL, Kangaroo T, Tracey B, O'Donnell P, Volfson D, Latzman RD, *et al.* Using a smartwatch and smartphone to assess early Parkinson's disease in the WATCH-PD study. *NPJ Parkinsons Dis* 2023;9:64.
- Gulde P, Vojta H, Schmiddle S, Rieckmann P, Hermsdörfer J. Going beyond PA: Assessing sensorimotor capacity with wearables in multiple sclerosis – A cross-sectional study. *J Neuroeng Rehabil* 2023;20:123.
- Woelfle T, Bourguignon L, Lorscheider J, Kappos L, Naegelin Y, Jutzeler CR. Wearable sensor technologies to assess motor functions in people with multiple sclerosis: Systematic scoping review and perspective. *J Med Internet Res* 2023;25:e44428.
- Motolese F, Capone F, Magliozzi A, Vico C, Iaccarino G, Falato E, *et al.* A smart devices based secondary prevention program for cerebrovascular disease patients. *Front Neurol* 2023;14:1176744.
- Straeten FA, van Zyl S, Maus B, Bauer J, Raum H, Gross CC, *et al.* EXERTION: A pilot trial on the effect of aerobic, smartwatch-controlled exercise on stroke recovery: Effects on motor function, structural repair, cognition, mental well-being, and the immune system. *Neurol Res Pract* 2023;5:18.
- Pipatpratarnporn W, Muangthong W, Jirasakuldej S, Limotai C. Wrist-worn smartwatch and predictive models for seizures. *Epilepsia* 2023;64:2701-13.

7. Maleki G, Zhuparris A, Koopmans I, Doll RJ, Voet N, Cohen A, *et al.* Objective monitoring of facioscapulohumeral dystrophy during clinical trials using a smartphone app and wearables: Observational study. *JMIR Form Res* 2022;6:e31775.
8. Masanneck L, Voth J, Huntemann N, Öztürk M, Schroeter CB, Ruck T, *et al.* Introducing electronic monitoring of disease activity in patients with chronic inflammatory demyelinating polyneuropathy (EMDA CIDP): Trial protocol of a proof of concept study. *Neurol Res Pract* 2023;5:39.

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