



# WearTel: a potential solution to lack of objective patient assessment tools in remote care during the COVID-19 pandemic

Ralph J. Mobbs<sup>1,2,3,4</sup>, Callum Betteridge<sup>1,2,3,4</sup>

<sup>1</sup>NeuroSpine Surgery Research Group (NSURG), Sydney, Australia; <sup>2</sup>NeuroSpine Clinic, Prince of Wales Private Hospital, Randwick, Australia;

<sup>3</sup>Faculty of Medicine, University of New South Wales, Sydney, Australia; <sup>4</sup>Wearables and Gait Assessment Group (WAGAR), Sydney, Australia

Correspondence to: Ralph J. Mobbs. Prince of Wales Private Hospital, Suite 7, Level 7, Randwick, NSW 2031, Australia.

Email: ralphmobbs@hotmail.com.

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Spinal surgery is associated with substantial financial cost and utilization of resources. A recent systematic review showed that surgical management of lumbar radiculopathy costs \$51,156–\$83,322 USD per quality adjusted life year compared to non-operative intervention (1). Monitoring and evaluation of surgical outcomes is imperative to justify these costs to health economists, governments, hospitals and insurers, and for the patient and surgeon to confidently agree on surgical intervention and recovery strategies. Traditionally, outcomes have been measured with surveys taken by the patient/patient reported outcome measures (PROMs), for example the Oswestry Disability Index (ODI), Visual Analogue pain Scale scores (VAS) or Short Form Health survey (SF-12, SF-36). Interest in more objective outcome measures of disability has steadily increased over the last 3 decades, with studies published on the 5-time sit-to-stand test, 6-minute walk test (6-MWT), timed-up-and-go (TUG) test and laboratory-based gait analysis, among others (2). However, due to the COVID-19 pandemic, health care has understandably been forced into a model which avoids face-to-face interactions in favour of remote-care models using ‘Telehealth’ technologies. These technologies include telephone communication as well as asynchronous digital services including email, text messages and provider-to-provider communications (3). Unfortunately, during this era, clinicians have been forced to forego face-to-face patient assessment, relying on subjective PROMs to supplement history taking during a Telehealth consult.

Technological advances have led to reliable surface sensor technologies that can collect and display various health metrics, such as gait analysis, in the form of wearable

accelerometers. These devices, generally “smart” watches, can provide a continuous data stream which includes metrics such as daily step count, step velocity and step length (4,5). Continuous, real time data collection is a significant improvement over single time point assessments such as the 6-MWT and TUG, even allowing post-intervention assessment of disc-herniation (6), or assisting in assessment of Lumbar Spinal Stenosis (7). *WearTel*<sup>TM</sup> is the combination of *Wearable technologies* collecting and transmitting real-time objective health metrics, and *Telemedicine* as an audio-visual communications platform, which can provide objective assessment measures, even in remote health care provision, or when face-to-face interactions are not indicated (8).

Unfortunately, there are several barriers to *WearTel* implementation which include technological limitations, regulatory and reimbursement issues. There is no clearly defined gold standard for wearable assessment of health metrics such as gait analysis, nor is there much regulation within the field (8). As a result, there are many algorithms, devices, measurement techniques and settings which dilute the marketplace and may result in inter-observer differences between clinics/hospitals which employ different devices or programs. Additionally, wearables may be ‘single-point’, or ‘multi-point’, placed at multiple key locations on the body. While multi-point sensors are more accurate and reliable, they also require more complex set-up, which cannot be done without face-to-face interactions (4). Conversely, single point sensors are less accurate, and improvements to their accuracy almost always come at the cost of battery life (5). Also, the COVID-19 crisis stimulated policy makers, regulators and payers to encourage expanded use of remote healthcare. Policy restrictions were loosened or lifted. Many

telehealth services are now reimbursed with fewer associated administrative burdens, but the environment is constantly evolving, making it difficult to take the necessary actions to comply with guidelines. This may involve considering eligible patient populations, temporary mandates during the emergency period of COVID-19, contract negotiations, and individual payer policy decisions (9,10).

Overall, *WearTel*<sup>TM</sup> has the potential to provide significant cost reduction, continuous objective monitoring and increased access for under-resourced communities. This is all whilst maintaining social-distancing during the COVID-19 pandemic. The global pandemic will have a lasting effect on society. If there are any positive consequences to be considered, they could include a stronger sense of community, as well as ongoing dissemination and implementation of telehealth services that improve population health, patient care, and lower costs.

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