Clinician's Commentary on Beyer et al.¹

With demands on the Canadian health care system increasing,² clinicians need to optimize their treatment protocols to help patients return to the community as quickly and safely as possible. Canadian stroke best-practice guidelines encourage evidence-based approaches to reduce the variability in care between patients, and they report the benefit of using validated assessment tools to standardize care and guide clinical reasoning in rehabilitation settings.³ These tools help clinicians systematically identify impairments during the initial assessment and monitor progress over the duration of treatment protocols. Standardized assessment tools also provide a common language for inter-professional team members to use when discussing their patients' progress, thereby guiding future health care decisions.

Despite the literature supporting the use of standardized outcome measures in physiotherapy, there are many barriers to their use. Studies have shown that clinicians do not have enough knowledge of, or confidence in, implementing and interpreting assessment tools, which explains why many therapists do not use such measures.^{4,5} Without an appropriate understanding of how to interpret an initial score or a change in score, it becomes challenging for clinicians to determine whether treatment protocols should be continued as is or modified to maximize recovery. Beyer and colleagues' recent article in *Physiotherapy Canada* addresses some of the uncertainties inherent in interpreting a change in score on the Chedoke-McMaster Stroke Assessment Impairment Inventory (CMSA-II),¹ a commonly used tool to determine the stage of motor recovery among individuals with stroke.⁶

To improve interpretation of the CMSA-II, Beyer and colleagues used two statistical approaches to determine the magnitude of the change in score needed to reflect a true change in patient status.¹ First, by computing minimal detectable change (MDC), they determined that 1 point in the arm, hand, leg, foot, and postural control domains and 2 points in the shoulder pain domain represent the threshold value for change (i.e., the expected score fluctuation in patients who are truly unchanged between tests).¹ Second, using diagnostic testing methodology (DTM), a threshold improvement value (i.e., how much change is needed for clinicians to have confidence that there is a true change) was determined to be 1 point for the leg, foot, and postural control domains.¹ Upper extremity threshold improvement values were not determined because of limitations in the availability of data.

Stratford and colleagues compared MDC and DTM analyses and found that DTM analysis was more effective in guiding clinical reasoning for physiotherapists.⁷ MDC is determined by analyzing individuals who have not changed to quantify test-retest variability.⁷ In contrast, DTM analysis includes all individuals, and it determines a change score that maximizes sensitivity and specificity for the measurement tool.⁷ Therefore, clinicians can have confidence that a change score of 1 point in the foot, leg, and postural control domains represents a clinically important change. This information can be used to guide clinical decisions.

Having confidence in interpreting the CMSA-II can help therapists improve communication with their patients, their patients' families, and the health care team. For example, a change of 1 point may sound minimal to a patient who has spent many hours a week participating in therapy (a scenario common in

stroke rehabilitation). However, clinicians can educate the patient that this score represents a true change in status, which may consequently motivate the patient to continue to participate in therapy knowing that her or his efforts are producing meaningful results.⁴

Likewise, if there is a 1-point drop in a CMSA-II domain, therapists can more confidently advocate to the health care team for further investigation and treatment, knowing that this change reflects genuine clinical deterioration. Having an improved understanding of the threshold for change may also enable clinicians to use the CMSA-II more easily to set measurable goals. Clinicians can use their previous experience to estimate the expected amount of time that patients with a similar presentation will improve 1 point on the CMSA-II and then use this information to determine whether their current patient is progressing at the expected rate.⁷ This comparison can guide clinicians to re-evaluate which aspects of the current treatment plan are most effective or how to adjust their treatment approach to improve results.

The report by Beyer and colleagues¹ helps improve the interpretation of change in a CMSA-II score; thus, it would be interesting for future research to determine whether the time it takes for an individual to demonstrate a meaningful change provides any new clinical insights. For example, predictive models using the CMSA have many errors, thus limiting their clinical use.⁸ Current models use initial presentation as their primary input; inserting the amount of time it takes for a patient to show true change in their CMSA-II score may improve those models that predict recovery. Having better insight into the projected recovery for individuals with stroke may improve the organization of resources and services for discharge, thereby facilitating improved community re-integration.

Future research should also determine threshold improvement values for the upper extremity (hand, arm, and shoulder pain) domains of the CMSA-II to provide insight into change scores beyond MDC values alone.

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