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CORR Insights

CORR Insights®: Reliability and Validity of the Musculoskeletal Tumor Society Scoring System for the Upper Extremity in Japanese Patients

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Where Are We Now?

Limb-salvage surgery for an upper or lower extremity tumor can be a life-saving procedure that allows the patient to survive with a viable and functional limb. Of course, we are left with a key question: Exactly how viable and functional are these limbs? The Musculoskeletal Tumor Society (MSTS) scoring system can help investigators and clinicians answer this question, but the MSTS score was written in English and tested on patients from the United States [7]; for it to be used elsewhere, it needs to be translated and validated in the languages spoken where the tool is used.

In the current study, Uehara and colleagues psychometrically assessed the Japanese version of the MSTS scoring system for the upper extremity (MSTS-UE) and found that it had excellent test-retest reliability, acceptable internal consistency, and construct validity. In short, the MSTS-UE was consistent across time points and the domains of the scoring system, as well as measured what it was supposed to be measuring. However, the criterion validity, or the ability of the scoring system to predict another validated outcome assessed at the same time point, was found to be less consistent.

Other scoring systems used to measure limb function such as the patient-derived Toronto Extremity Salvage Score (TESS) [4] showed substantial correlation. However, the correlation with the SF-36 (quality-of-life measure) physical component was fair, while correlation with the SF-36 mental component and MSTS-UE emotional acceptance component were slight to fair. The variability in scores indicates that our patients' mental and emotional perceptions of their outcomes differ substantially from the perceptions of the physician.

Where Do We Need To Go?

It is apparent from the current study and one other that I know of [9] that many factors contribute to patients' functional outcome scores following limb-salvage surgery of the upper extremity, and that physician-derived scores do not necessarily correlate with

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patient-reported outcomes. In some patients, quality-of-life with respect to mental and emotional health may trump domains such as ROM and strength. Given that patient-centered care should focus on patient perceptions of outcomes (as opposed to physician perception of outcomes), there remains a gap in available patient-reported outcome scores that more accurately reflect the goals of patient-centered care in oncologic limb reconstruction.

One way to fill that gap is through the NIH-funded Patient Reported Outcomes Measurement Information System (PROMIS), which develops reliable and precise measures of patient-reported health status for physical, mental, and social well-being [3, 13]. This extensively validated outcomes-assessment system is available for research purposes in a wide range of health domains. PROMIS provides a timely opportunity for orthopaedic oncology specialists for validation in the oncologic limb-salvage surgery. In fact, PROMIS has been validated in patient populations with orthopaedic disorders of the upper extremity [5, 10], foot and ankle [8], and spine [2, 12] with less administrative and patient burden than other patient-reported outcomes due to the ease of online access and the user-friendly nature of the system [1]. It uses computerized adaptive testing (CAT), in which a computer algorithm customizes and selects subsequent items based on individual examinee's answers [1].

One advantage of the PROMIS system is that many of the associated measures have already been translated and validated in several other languages, and translations are in progress for many others as well [11]. Although many PROMIS items have been translated into various languages, there is an opportunity for orthopaedic oncology researchers to add to the list of translations.

How Do We Get There?

The full "Physical Function" PROMIS is an example of a subdomain that has yet to be translated into French, an important translation for international collaborative studies involving patients in France, Canada, and Belgium. Translators representing dialects from regions within these countries should collaborate using standardized methodology to create a universal translation that could be validated in the relevant populations. One way to do this is by applying the universal approach, meaning that one version of the translation is used for multiple countries instead of country-specific versions of the same language. Although the universal approach allows for centralized item development, and reduces bias introduced from multiple translations, it requires contributions from dialects of representative regions throughout the various countries involved.

Patients with musculoskeletal tumors should be evaluated concurrently using PROMIS scores, as well as conventional assessment tools such as the MSTS and TESS. The psychometric properties of the PROMIS system in this patient population could then be evaluated. The capability of the PROMIS system to incorporate mental- and social-health domains should provide the much-needed individual patient-reported mental and emotional health domains that are missing from the MSTS and TESS.

As all fields in medicine move towards a more patient-centered approach to healthcare, systems that mathematically take into account a wide variety and broach range of health domains, such as PROMIS, will help us more accurately assess patient outcomes in orthopaedic oncology. In addition, the ability to store data online and share deidentified outcomes data should provide opportunities for large-scale collaboration, not only in validation studies, but also in outcomes assessment, prospective cohort studies, and randomized trials [6].

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