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# A structured literature synthesis of wrist outcome measures: An evidence-based approach to determine use among common wrist diagnoses

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## ABSTRACT

*Study Design:* Structured literature synthesis.*Introduction:* Hand therapists and researchers have numerous options when selecting outcome measures for patients with wrist pathologies. An evidence-based approach to determining which measures are used most often can inform choices.*Purpose of the Study:* To describe how frequently outcome measures are used in recent randomized controlled trials of patients with wrist diagnoses. Identifying assessment design and related International Classification of Functioning, Disability and Health (ICF) domains provides additional consideration for selection.*Methods:* Systematic PubMed and Cumulative Index to Nursing and Allied Health Literature searches for the time frame between January 2005 and March 2015 captured measures used in randomized controlled trials researching wrist-specific fractures, ligament injuries, nerve injuries, arthritis/arthroplasty, or stress injuries/wrist pain.*Results:* Three most frequent measures used within each diagnostic category are detailed with assessment design described and ICF domain identified. Across diagnoses, grip/pinch strength and Disabilities of Arm, Shoulder and Hand were the most frequently used physical and patient-reported outcome measures, respectively. The Jebsen–Taylor Hand Function Test was the most frequently used performance measure.*Discussion and Conclusions:* Consideration of the evidence, ICF domains, wrist diagnoses, and assessment design can help hand therapists select the measure most appropriate for use.*Level of evidence:* 2a.

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## Introduction

The wrist, a pivotal component of the upper limb, precisely positions the hand to effectively engage with the environment.<sup>1</sup> Injury or pathology can impact structures of the wrist, limiting the ability to perform activities and participate in daily life. Appraising limitations through evaluation is essential for determining which structures and daily activities are impacted.<sup>2</sup> Resultant information shapes the recovery process, framing problems to be addressed and goals to be achieved. Use of standardized

assessment tools, or outcome measures, to evaluate wrist injury and pathology ensures greater accuracy and consistency in detecting and documenting physical and functional limitations. Selecting the most effective measures to capture wrist function is a challenge because of the numerous outcome measures available that differ in scope and design as well as range in relevance to specific upper extremity pathology. For an evidence-informed use of these measures and application to wrist pathologies, it is imperative that their intended domains of measurement, design, and psychometric properties are considered.

This paper presents an overview of the characteristics essential to critical selection of an appropriate measure by first defining those characteristics (domain, design, and psychometric properties) and then conducts a review of the literature to determine which measures are most frequently reported in high-quality studies of wrist pathologies.

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## Essential characteristics of an outcome measure

### Domain

The International Classification of Functioning, Disability and Health (ICF) details a framework for understanding components of health (Fig. 1).<sup>3</sup> These components, or domains, include body functions (ie, range of motion [ROM], strength, and sensation), activities (ability to perform daily tasks or actions), and participation (ability to engage in daily life situations). Outcome measures may investigate single or multiple domains, whose relevance to wrist pathologies vary. This article targets measures pertinent to body functions, activities, and participation most impacted by wrist injury or disease process.

### Assessment design

Patient outcomes can be measured and reported in multiple ways. Observational skills, specific tools, manual assessment, task performance, interviews, and questionnaires are all modes of inquiry used. Three categories of assessment design will be used to organize the outcome measures described in this article.

Physical measures include tools (ie, goniometers, dynamometers, pinch meters, filaments, disk-criminators, and measuring tape), observation, and palpation to assess body functions. Performance measures evaluate patients' ability to demonstrate specific tasks or actions. Clinicians score performance measures by timing the task or rating quality of performance.

Even more widely used are patient-reported outcome (PRO) measures, a self-assessment of functional difficulties in response to items on a questionnaire.<sup>4,5</sup> PROs vary in scope. They may include items relating to body functions, activities, participation, or combinations thereof. PROs also vary in orientation. Generic measures consider overall health conditions, whereas regional measures (describing body systems) and disease-specific measures (tailored for a particular diagnosis) are most relevant to assessing patients with wrist pathology.<sup>4</sup> The use of PROs is increasing in clinical practice and outcomes research, with value placed on their ability to convey the patient experiences.

### Psychometric properties

Reliability, validity, and responsiveness address the consistency and accuracy of an outcome measure.<sup>6</sup> Ascertaining the reliability of a test when administered at multiple time points (test–retest reliability) and/or by multiple clinicians (inter-rater reliability) is necessary for confident use of an outcome measure in daily practice.<sup>6</sup> Assurance of criterion, construct, content, or face validity is also critical for the accuracy of the purported measure.<sup>6</sup> Sensitivity to change in a particular diagnosis is essential for detecting

whether an outcome measure is responsive to differences over time.<sup>7</sup> Values for minimal clinically importance differences are established to determine clinically relevant change in status. Psychometric properties of a tool should be carefully considered before use to ensure the most accurate and reliable reporting and documentation in the assessment of wrist pathology.

Previous research describes outcome measures suited for evaluating patients with wrist pathologies.<sup>8–12</sup> In most instances, the measures selected for review were at the discretion of the authors, likely drawing on clinical and academic experiences. We chose an alternate and more rigorous method for identifying measures to review by conducting a comprehensive search of the literature. This evidence-based approach uses a systematic search design to identify studies with high levels of evidence for a particular patient cohort and discover which outcomes were used. These measures are then included for review. Searches are stratified by areas of interest, such as specific wrist diagnosis and/or ICF domain. Articles using a systematic search design include review of measures related to a single cohort, such as patients with carpal tunnel syndrome (CTS)<sup>13</sup> or risk for falls,<sup>14</sup> but none to date have included the larger category of all types of wrist pathologies.

Examination of the outcome measures most frequently used in the literature for assessing wrist pathologies located through a systematic search design can provide hand therapists with informed guidance for daily practice. Stratifying the literature search according to common wrist pathologies allows for a tailored overview of measures used with specific diagnostic subgroups. Incorporation of more recent studies with higher levels of evidence as compared with similar reviews yields current information for clinicians. Linking measures to ICF constructs gives directed context for selecting measures for clinical practice. Organizing outcome measures by their design can set clinician expectations as to what information selected tools can accurately and consistently provide. Review of the psychometric properties plays an essential role in determining which outcome measures to choose for clinical assessment.

This study uses the literature to explore which measures best pertain to patients with wrist pathologies. Using an evidence-based approach, the author aim to determine how frequently outcomes measuring the wrist are used in published studies with high levels of evidence, thereby providing hand therapists with informed guidance for daily practice.

## Methods

A systematic search process was used to identify outcome measures with the greatest relevance and utility for assessment of impairment and functional limitations in wrist conditions.

### Searching the literature

Searches were conducted by the coauthor (SPM) through a process involving 3 iterative steps. First, 5 diagnostic subgroups comprising common conditions affecting the wrist were identified. They included fractures, ligament injuries, nerve injuries, arthritis or arthroplasty, and stress injuries/wrist pain. A list of relevant search terms was generated to best capture studies of the aforementioned diagnostic groups (Table 1). Second, separate search terms were created to identify measures of impairment, limitations, or participation restrictions commonly used across these diagnostic subgroups (Table 1). Third, the authors conducted a search for these terms on PubMed and Cumulative Index to Nursing and Allied Health Literature databases between January 1, 2005 and March 15, 2015. Two filters were applied to the search: randomized controlled trials (RCTs) published within the last 10 years. Both filters ensured that only recently published high-quality studies

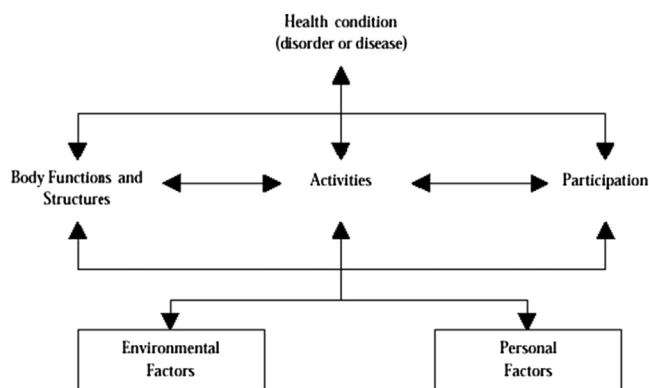


Fig. 1. International Classification of Functioning, Disability, and Health.<sup>3</sup>

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