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# Hand therapy interventions, outcomes, and diagnoses evaluated over the last 10 years: A mapping review linking research to practice

Sandy C. Takata OTD, OTR/L, Emily T. Wade OTD, OTR/L, Shawn C. Roll PhD, OTR/L, RMSKS, FAOTA *

*Chan Division of Occupational Science and Occupational Therapy, University of Southern California, Los Angeles, CA, USA*

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ABSTRACT

*Study Design:* Mapping review.
*Introduction:* Although published literature and evidence to support medical practice is becoming more abundant, it is not known how well available evidence supports the full spectrum of hand therapy practice.
*Purpose of the Study:* The aim of this mapping review was to identify strengths and/or gaps in the available literature as compared with the hand therapy scope of practice to guide future research.
*Methods:* A systematic search and screening was conducted to identify evidence published from 2006 to 2015. Descriptive data from 191 studies were extracted, and the diagnoses, interventions, and outcomes used in the literature were compared with the hand therapy scope of practice.
*Results:* Osteoarthritis, tendon surgeries, and carpal tunnel syndrome were most frequently studied. Exercise, education, and orthotic interventions were most common, each used in more than 100 studies; only 12 studies used activity-based interventions. Primary outcome measures included range of motion, pain/symptoms, strength, and functional status.
*Discussion:* Abundant high-quality research exists for a portion of the hand therapy scope of practice; however, there is a paucity of evidence for numerous diagnoses and interventions.
*Conclusions:* More evidence is needed for complex diagnoses and activity-based interventions as well as behavioral and quality-of-care outcomes.
*Level of Evidence:* Not applicable.


## Introduction

Orthopedic injuries and disorders of the upper extremity have a worldwide prevalence of 26.9%.[1] Whether caused by overuse or a traumatic incident, upper extremity musculoskeletal disorders often negatively impact an individual's ability to participate in meaningful play, work, and leisure activities. Hand therapy strives to increase functional capacity and quality of life for individuals with upper extremity disorders[2]; however, maximizing quality of care and achieving positive outcomes depend on adequate available evidence. As such, the American Society of Hand Therapists (ASHTs) has endorsed the use of evidence-based practice in a position paper on hand therapists' practice.[3] Fortunately, a wealth of evidence has been published in the area of upper extremity rehabilitation in hand therapy–specific journals.[4] In addition, several Cochrane systematic reviews have focused on commonly treated diagnoses in hand therapy, such as distal radius fracture[5] and carpal tunnel syndrome.[6-8]

Despite adequate avenues for publishing hand therapy–related evidence, it is important to examine to what extent the currently available evidence supports the full scope of practice for hand therapy. In 2011, a review examined all research articles published in the *Journal of Hand Therapy* through the lens of the World Health Organization's International Classification of Function.[9] At that time, research for hand therapy interventions focused on body function and structures with very little evaluation from an activities, participation, or environment perspective. Although valuable, this previous review was limited in scope as it only evaluated evidence from 1 journal. Moreover, there was no assessment of the diagnoses being studied to determine if research evidence was representative of the full scope of hand therapy practice. There have been no other comprehensive examinations of published literature in upper extremity rehabilitation that compares available research evidence to contemporary practice.

Mapping reviews have been used to compare research and practice to illuminate gaps and guide research priorities. In the field of developmental medicine, mapping reviews were used to identify

* Corresponding author. Chan Division of Occupational Science and Occupational Therapy, University of Southern California, 1540 Alcazar Street, CHP 133, Los Angeles, CA 90089-9003, USA. Tel.: 323-442-1850; fax: 323-442-1540.
*E-mail address:* sroll@usc.edu (S.C. Roll).

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**Table 1**
Indexing terms and keywords used within each of the 3 search categories

| Search Categories | Indexing terms | Keywords |
|---|---|---|
| Musculoskeletal diagnoses of the forearm, wrist, & hand | *MeSH*: wounds and injuries, arm injuries, hand injuries, sprains and strains, tendon injuries, peripheral nerve injuries, musculoskeletal diseases, hand deformities, joint diseases, muscular diseases, contracture, musculoskeletal pain, rheumatic disease<br>*CINAHL/SPORTDiscus*: hand fractures, finger flexor tendons, finger joint, carpal joints | Arthroplasty, burn, carpal tunnel syndrome, distal radius fracture, distal radial fracture, dequervain, dupuytren, extensor tendon repair, flexor tendon repair, mallet finger, nerve repair, osteoarthritis, rheumatoid arthritis, tenolysis, tenosynovitis, tendonitis, trigger finger, ulnar collateral ligament repair, gamekeeper thumb, skier thumb, boutonniere deformity, swan neck deformity, edema, burn |
| Interventions | *MeSH*: therapeutics, complementary therapies, mind-body therapies, laser therapy, physical therapy modalities, prosthesis fitting, rehabilitation, activities of daily living, occupational therapy<br>*CINAHL/SPORTDiscus*: therapeutic exercise, alternative therapies, mind-body techniques, combined modality therapy, orthoses | Exercise, therapeutic activity, hand writing, work hardening, work conditioning, manual therapy, orthosis, orthotic, joint protection, range of motion, mobilization, massage, myofascial release, contrast bath, cryotherapy, diathermy, fluidotherapy, hot pack, iontophoresis, electrical stimulation, paraffin, phonophoresis, ultrasound, whirlpool, biofeedback, compression therapy, desensitization, scar management, taping, kinesiotape, wound care |
| Clinicians | *MeSH*: N/A<br>*CINAHL/SPORTDiscus*: physical therapy, occupational therapy, hand therapy | Occupational therapy, occupational therapist, physical therapy, physical therapist, physiotherapy, physiotherapist, hand therapy, hand therapist |

N/A = not available.

gaps in the measurement of long-term outcomes for patients with cerebral palsy as well as demonstrate the need for more rigorous outcome measures after surgical procedures.[10,11] Although a mapping review in gerontology, the need for further research related to influenza, falls, osteoporosis, fractures, and mobility was established.[12] Another mapping review was used to determine recommendations for improving the fieldwork experience for occupational therapy students.[13] Similar to these reviews, the hand therapy profession may benefit from a comprehensive examination of the existing research literature as it compares with practice.

## Purpose of the study

As a type of scoping review, a mapping review provides an overarching representation of the available literature within a field.[14,15] When conducted in a systematic way, mapping reviews are an effective method to communicate the breadth of knowledge on a particular topic and identify gaps in the overall evidence that can guide priorities for research.[15] Thus, the purpose of this mapping review was to identify gaps and research priorities by examining all current literatures on the treatment of distal upper extremity musculoskeletal disorders as compared with the ASHT scope of practice.[16]

The review sought to answer the following questions: Where, by whom, and at what level of evidence is hand therapy–relevant research being conducted? Which professionals are providing hand therapy–relevant interventions in published research? To what extent is evidence available across all diagnostic and intervention categories described in the ASHT scope of practice? What types of outcome measures are being used in research to evaluate the effectiveness of hand therapy interventions? What gaps exist in current research evidence related to diagnoses, types of interventions, and outcome measures in hand therapy?

## Methods

Comprehensive searches were conducted in PubMed, CINAHL, and SPORTDiscus for human studies published in English between January 2006 and December 2015 that included interventions for distal upper extremity musculoskeletal disorders. An audit of all medical subheadings (MeSH) and corresponding CINAHL headings was conducted to identify potentially relevant indexing terms across 3 search categories (ie, diagnoses, interventions, clinicians). In addition to indexing terms, key words were identified for all diagnoses and interventions from the ASHT scope of practice[16] as well as key words for the primary hand therapy professions. Table 1 provides a list of all indexing terms and key words within each category used in the search for this mapping review. Only those articles that appeared in all 3 search categories were included. In addition to database searches, titles and abstracts for all articles published in the *Journal of Hand Therapy* between the years 2006 and 2015 were screened for inclusion.

Articles were systematically reviewed in a multistage screening and selection process. All results were initially screened by title to eliminate articles evaluating treatment for conditions unrelated to the distal upper extremity (eg, Achilles tendon). Duplicate results were removed, and 2 raters independently screened the abstracts of remaining records to identify studies meeting 2 general inclusion criteria: (1) involved a musculoskeletal or orthopedic diagnosis of the distal upper extremity and (2) evaluated or discussed interventions within the scope of hand therapy practice. Full texts were located for articles meeting general inclusion criteria and read by 2 reviewers. Any full text for which consensus was not reached by the reviewers was read by a third reviewer who determined final eligibility. Final inclusion was not restricted by level of evidence to ensure that the results of this review were based on all available literatures.

Using REDCap,[17] the following descriptive data were extracted from included studies: publication year, geographic region in which the study was conducted, author profession(s), treating provider(s), study design, participant age, diagnosis, intervention, and outcome. For ease of analysis, study interventions from the ASHT scope of practice[16] were organized into 7 categories: education, exercise, activity, manual techniques, physical agent modalities, orthotics, and miscellaneous (Table 2). Similarly, outcomes were organized into 5 categories informed by the International Classification of Functioning, Disability, and Health,[9] including body structure/pathology, pain/symptoms, function/performance, and behavioral/psychosocial. A sixth outcome category, quality of care, included any outcomes associated with the process of care itself. Figure 1 details specific outcome measures within each category. In addition to these categories, the use of standardized questionnaires (eg, Disabilities of the Arm, Shoulder, and Hand [DASH]) and other patient-reported outcome (PRO) measures was identified.

To answer the questions driving this mapping review, frequencies were calculated, and crosstabulations were conducted to evaluate relationships among the data categories. Comparison