

# Complex rehabilitation technology service delivery: scoping review process & methodology

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## BACKGROUND

Complex Rehabilitation Technology (CRT) is defined as products and services, including medically necessary individually configured highly customized manual and power wheelchair systems, adaptive seating systems, alternative positioning systems, and other mobility devices that require evaluation, fitting, design, adjustment, and programming [4]. CRT holds the potential of supporting independence for individuals with disabilities by reducing their reliance on others and enabling mobility for function, employment, education, and independent living. Wheeled mobility service delivery is not a new concept or technology. However, dramatic changes have occurred in the last few decades, including changes to funding, provider qualifications, consumer needs and desires, and advances in technology. Seating and mobility experts generally agree on how wheeled mobility service delivery should work; however, relatively little is known about how service delivery processes work in practice. The third-party policies that currently regulate CRT service delivery, specifically Medicare, have undergone significant changes to coverage and payment, which have created barriers to access. Consequently, this has also impacted state Medicaid programs, private payers adopting Medicare policy, and international viewpoints. The University of Pittsburgh, The Ohio State University, University of Michigan, and industry stakeholders, including clinicians, suppliers, manufacturers, researchers, and policy makers, are working to create a novel policy to update and improve the service delivery process. Through evidence-based practice and stakeholder input, the goal is to shift health delivery policy towards value-based care to better support people with mobility impairments.

The overall goal is to identify and investigate barriers and facilitators to current coverage policy for CRT, and fully understand the potential for the development of a new proposed coverage policy. The aims of the overarching project are to: 1) identify and investigate barriers to current coverage policy for CRT via a scoping review of current health & disability policy recommendations; 2) engage with a diverse group of stakeholders to assist with the creation of an online survey that validates common themes from the scoping review; and 3) create and distribute an online survey to multiple healthcare stakeholder groups relevant to CRT. The preliminary results from the scoping review (Aim #1) are presented here. A scoping review allows researchers to examine the literature with a broader outlook, as compared to a systematic review that answers a specific research question [1]. The research team is utilizing Colquhoun et al. (2014) 6 steps process on how best to conduct the scoping review: 1. identify question, 2. Identify relevant studies, 3. Study selection, 4. Charting the data, 5. Collating, summarizing, and reporting results, and 6. Consultation [2]. Through the literature search, the research team intends to identify themes related to CRT delivery in different funding environments and clinical contexts. Through a broad search of several science and health databases and an in-depth study selection process with a diverse team of industry professionals, national and international CRT service delivery policies are explored and analyzed. The research team is in the process of completing the scoping review and gives its up-to-date progress as of February 2021.

## METHODS

### Study design

The team collaborated with a diverse team of content experts across three Universities, and a research librarian to identify relevant key terms and develop search strategies across several databases. Various terms and strings were created, and the librarian modified the search terms for each database to develop the most comprehensive results. The search string was designed using the Population, Concept, Context (PCC) layout. The population key terms consist of “individuals with mobility impairments” and “disability”. Concept key terms include “manual and power wheelchairs,” “scooters,” mobility devices, and “CRT”. The context terms are “service delivery,” “wheelchair service delivery,” “policy,” “health insurance,” “Medicare,” “Medicaid,” “provision,” “guidelines,” and “standards”. The team also conducted a thorough hand search of relevant industry conference proceedings, specifically

searching for “service delivery,” “provision,” “wheelchair,” and “policy” to determine additional article inclusion or exclusion. Article results were restricted to the publication date range of January 1<sup>st</sup>, 1995 – November 30<sup>th</sup>, 2020.

### Study selection and outcome

A flow-chart was developed to track the results yielded from each database and the number of articles kept after each round of review up to this point (Figure 1). Two student research assistants examined PubMed, CINAHL, Scopus, Web of Science, Embase, IEEE Explore, Compendex, INSPEC, RESNA, International Seating Symposium (ISS), Canadian Seating and Mobility Conference (CSMC), and Oceanic Seating Symposium (OSS). Results from each database were imported into a reference management software, Zotero, and then imported to Covidence. Covidence is a review software, which was used to help organize and screen the articles.

Once the articles were imported into Covidence, the team began a title and abstract screening. Each article was reviewed twice by various team members. When conflicts about inclusion/exclusion arose, all team members were consulted and collaborated to determine a final decision. For example, an article was excluded if it focused on wheelchair durability testing, wheeled mobility skills and performance, wheelchair training, and post-professional, pre-professional, or caregiver training. It was also excluded if it was a dissertation, thesis, meta-analysis, systematic review, scoping review, or literature review. For systematic, scoping or literature reviews that met the inclusion criteria, the references were hand searched. Inclusion criteria was comprised of peer-reviewed journal articles, peer-reviewed literature based on expert opinion, conference proceedings, policy papers, and gray literature (e.g., magazine articles, briefs, and newsletters). Articles needed to be in English and published between January 1, 1995 to November 30, 2020. Further, the study type could be either qualitative or quantitative.

Once all imported articles were screened using the title and abstract, the research assistants located and imported the full text versions of the articles for the second-tier screening process. The team initiated a full-text

review of the remaining articles. As conflicts arose this round, two subject matter experts from the team made the final decision of inclusion or exclusion. Figure 1 details the flow-chart for the scoping review process done to date. A numerical thematic analysis will be used to extract contextual or process-oriented information from each study by determining which variables to extract to successfully answer the research question. The process of charting the data will be an iterative process in which researchers continually extract contextual data. Once the data is extracted, the team will complete a descriptive numerical summary analysis and a qualitative thematic analysis.

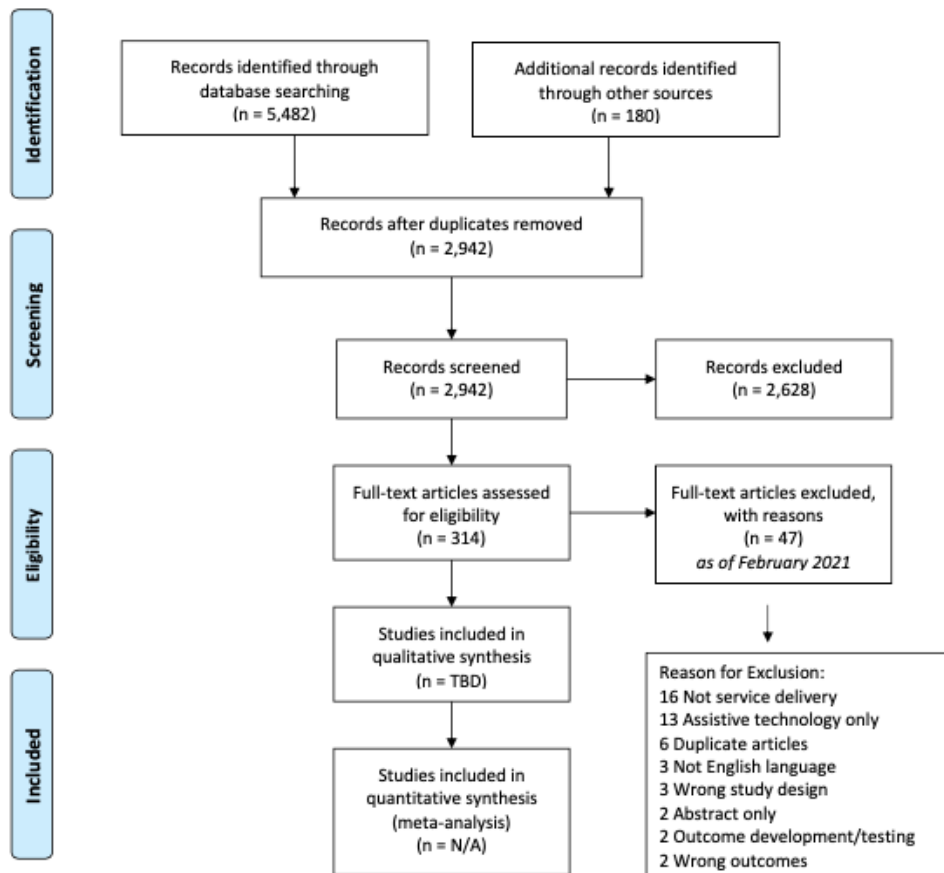


Figure 1 PRISMA Flow Chart. Numerical breakdown of included and excluded articles. [3]

Preliminary findings from the data extraction step are reported, and the results will be used to refer to the overall purpose of the study.

## **RESULTS**

The database searches resulted in a total of 5,662 articles. After removing duplicate articles, the remaining 2,942 articles were screened using the inclusion and exclusion criteria leaving 314 articles for the full-text review. Common themes observed in the review of full-text articles include service delivery in less resourced settings, CRT satisfaction surveys, Medicare reimbursement and coverage descriptions, and identifying funding sources. Some articles fell outside of the date range but still had useful information and were evaluated for background information. During the second screening process, the team aims to reduce the number of studies to about 30-50 articles for data extraction analysis. Many of the journal articles and grey literature were excluded in the full-text review stage because they broadly addressed assistive technology instead of manual and power mobility devices specifically, a criterion for our research question. As of February 2021, seven articles were analyzed in depth, and preliminary themes include minimal financial resources to purchase CRT, many clients are unaware of their insurance benefits, there is poor evidence-based practices to inform health policy, and logistical challenges receiving a prescription from a health professional. At the completion of this scoping review, more concrete results are expected regarding CRT service delivery policy information in the literature.

## **DISCUSSION**

According to the current findings, it does not appear that a scoping review about CRT service delivery policy has been completed previously. There is intriguing literature regarding the existing shortcomings in the service delivery process both in the United States and international settings. The evidence includes a wide range of scientific journal articles and grey literature (primarily trade magazine articles), in a variety of international contexts including Europe, Africa, and South America. There appears to be limited information in the literature articulating how these challenges can be addressed with policy reform, further confirming this research project is necessary. The service delivery process is complex and involves collaborative decision-making between clients, caregivers, clinicians, and suppliers. The greatest barriers appear to be inadequate funding and a lack of understanding and education for recipients of CRT and their healthcare team. Future policy development and implementation will need to address these shortcomings to improve the service delivery process. The team intends to solidify the themes preliminarily identified and expand on additional ones upon completion of the scoping review. The current strategies and analysis procedures will serve as pilots for the remainder of the full-text review and data extraction process.

There are limitations with comprehensive collection of all articles, specifically not having access to all relevant conference proceedings and difficulty locating the full text for older articles. Several conferences do not provide access to articles published in their syllabus to individuals that did not attend in person. Some articles more than twenty years old could not be located. Thorough internet searching was completed to find full text articles, but after collaborating with several university librarians some of the international journals could not be accessed. The team is in the process of completing the data extraction part of the scoping review process which will support further concrete findings. The research team can provide an evidence-based methodological approach on how to conduct a scoping review for CRT service delivery.

## **CONCLUSION & FUTURE WORK**

The research team continues to work on the full-text review and extracting data from relevant scientific and grey literature to examine useful policy and procedures regarding CRT delivery. The themes generated during the scoping review will be shared with stakeholders to validate the findings (Consultation). The results from the scoping review will inform the development of a survey to be distributed to industry stakeholders, with the goal of validating current practices and identifying future directions for wheeled mobility service delivery. This will allow for stakeholders and consumers to suggest additional references and provide insight beyond those described in the literature. Once the team has completed the final steps, the collected results will inform the other projects, which are part of the of the larger Disability and Rehabilitation Research Projects (DRRP) to help produce an innovative policy to update and improve the process of CRT service delivery.

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